



D.M. OSBORNE & CO.

THE CARE OF STOCK AND OTHER
VALUABLE INFORMATION.

D.M. OSBORNE & CO'S
HANDY BOOK FOR HOUSE
AND FARM - SERIES NO 2.



Factory.
AUBURN, N.Y.
U.S.A.

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Distributing Houses in all the Principal
Cities of the United States.

AGAIN we take pleasure in furnishing to the agriculturists our annual catalogues, combining with the description of our machines other valuable information for House and Farm. Our last publication was of a similar nature, and was so thoroughly appreciated that we have adopted the same plan this year.

In the brief space used, we have not been able to say all for our implements that should be said, but if you are interested in them, the Osborne agent, or some neighbor who is using them will gladly tell you more of their merits; an additional description of any machine will be sent by applying to any of the branch houses given below.

Respectfully,

D. M. OSBORNE & CO.

Foreign Houses.

London, England.	Bremen, Germany.
Paris, France.	Melbourne, Australia.
Odessa, Russia.	Buenos Aires, S. A.
Cape Town, South Africa.	

OUR MACHINES.

The best indication of the quality and popularity of a machine is the demand for it, and the unprecedented number of our machines manufactured and sold this past season is a sufficient index of the esteem in which they are held by the farmers of the world.

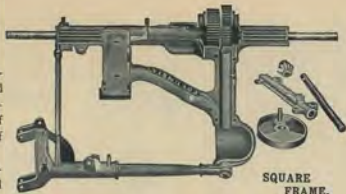
The most rigid supervision ever exercised in a factory, and a solicitous attention to all and every detail of construction, combined with unequalled work in the field, has placed us in the lead.

THE OSBORNE COLUMBIA MOWER.

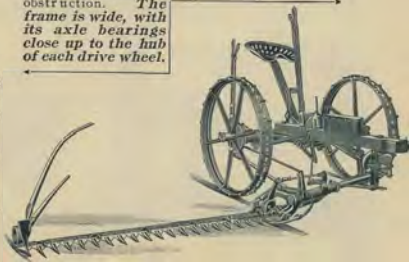
THE NEW MAIN FRAME, cast in one solid piece, is light and graceful; strong to withstand all the hard usage of the harvest, and rigid to resist all strain.

The great width between the main wheels, straddling the entire swath, spares the grass from being crushed into the ground, and prevents all side draft.

A crank shaft box, independent of the main frame, is a guarantee of the perfect meshing of the bevel gear and pinion and alignment of the pitman shaft.



SQUARE MAIN FRAME: *No danger of the driver being thrown from the seat, as neither wheel will leave the ground when the cutter-bar strikes a solid obstruction. The frame is wide, with its axle bearings close up to the hub of each drive wheel.*



SIZE: 4, 4½, 5 and 6 Feet.





COMPARE COLUMBIA, WITH COMPETITOR'S MOWER.

A main frame having diagonal push bar.

Danger of driver being thrown from the seat, as one of the wheels will raise from the ground when the cutter-bar strikes a solid obstruction.

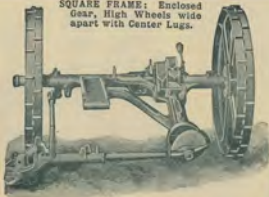
*The frame is narrowed to give room for a main drive gear; not supporting main axle **close up to the hub** of road wheel. With this style of frame the axle is liable to get sprung.*

The Columbia mower has noiseless, easy running shafting fully equipped with roller bearings. Every ounce of power goes directly to the perfectly meshed gearing and from thence to the knives, guaranteeing a sure, rapid and easy cut. The main drive gear and two intermediate gears are mounted upon the main shaft.

*The movable cover fully protects all the gearing from injury by rain or dust, and is easily swung back for the purpose of inspection or oiling. **THE WEIGHTED LEVER** for throwing the gearing in or out of engagement can be operated by the hand or foot.*



SQUARE FRAME: Enclosed Gear, High Wheels wide apart with Center Lugs.



The hinge coupling has a long sleeve with shield, passing in front and under knife head end of pitman where it comes nearest the ground and is most liable to get bent.



Hinge Coupling with long Sleeve, double ears set wide apart to prevent cutter-bar from sagging back out of line.

OUR STRAIGHT DRIVE STEEL PIT-MAN IS LONG, and gives a direct, clean and powerful action to the cutting mechanism.

It is connected to the knife head by a ball and socket joint, and is adjustable so that the accurate position of the knives in the guards is assured.

ON ALL MOWERS, when rocking the bar to tilt guards up or down, the bar travels forward and back about two inches, carrying knife head of pitman with it. This cramps the bearing at both ends of the pitman. *The Columbia is the only machine that entirely overcomes this difficulty. Our self-aligning brass box on wrist pin of crank head, and ball and socket joint at knife head, absolutely prevent any heating, binding or wearing of parts.*

THE HINGE AND HINGE BAR thoroughly protect the pitman from any possible injury from obstructions in the path of the machine.



Swivel Self-Aligning Box with Oil Chamber at Crank-Head End.



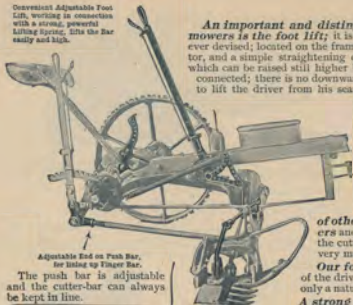
Brass Box in Two Pieces. All Wear Easily Taken Up.



Ball and Socket Connection at Knife Head End with Lock Nut.



Convenient Adjustable Foot Lift, working in connection with a strong, powerful lifting spring, lifts the Bar easily and high.



An important and distinguishing feature of all the Osborne mowers is the foot lift; it is beyond comparison, and the most perfect ever devised; located on the frame, the tread is directly in front of the operator, and a simple straightening of the leg is sufficient to lift the cutter-bar, which can be raised still higher by the hand lever to which the foot lever is connected; there is no downward push, tending

to lift the driver from his seat, but a straight forward push that acts easily and quickly. **Compare this with the foot levers**

of other mowers

and note the difference in the height to which the cutter-bars can be raised, the Columbia lifting very much higher than any other.

Our foot lift is adjustable to suit the leg reach of the driver, so that no stretching effort is necessary, only a natural push, with the seat as an effective brace.

A strong spring assists in raising the cutter-bar, it can be adjusted to carry nearly the entire weight, so that the bar will almost float over the surface, cutting smoothly and lightly, and throwing most of the weight on the main wheels, making the draft easy and increasing the power of the knives.

The efficiency and ease of operation of the tilting and lifting mechanism is perfect. **The push and tilting bars are at right angles to the cutter-bar,** consequently there is no swing to the latter; the tilt can be very high or low, as desired, it is direct, and the cutting is even whether mowing on level or rolling ground.





We own the patents covering the only practical Roller Bearing now being used in harvesting machinery, and manufacturers to whom we have licensed its use, have publicly announced its merits in the strongest terms.



Serrated Ledger Plate, Broad Clip.



wearing plates; the grass begins to fall with the movement of the machine, so instantaneous is the action of the cutting apparatus.

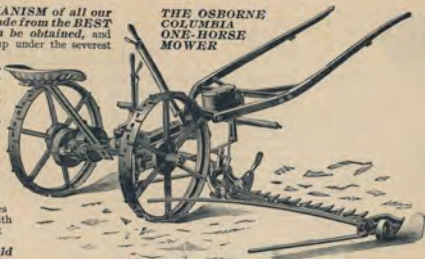
THE PAWLS IN EACH PAWL-PLATE ON OUR MOWERS ARE FOUR IN NUMBER, working in 29 teeth, consequently every movement of the wheels, when the machine is in gear, results in an instantaneous action of the knives. There is absolutely no lost motion, and no clogging at the very beginning of work.

THE CUTTING MECHANISM of all our harvesting machines is made from the **BEST OF MATERIAL** that can be obtained, and formed, tempered, and built up under the severest tests and most rigid inspection.

OUR RIGID STEEL CUTTER-BAR is an assurance of an evenly cut stubble; the guards are designed especially for close cutting, and are countersunk, where bolted to the bar, to prevent accumulation of mud and grass.

A SERRATED LEDGER PLATE and a **smooth knife**, a combination guaranteeing a perfect shear cut, whether in light or heavy grass;

the knives register with the utmost accuracy, being held in position by clips, and running against tempered steel



THE OSBORNE COLUMBIA ONE-HORSE MOWER

Is practically a duplicate of the two-horse mower, only it is lighter. It is perfectly adapted for small farms, parks, lawns and orchards. The draft is light and straight, with no weight on the back pad when the machine is at work. **It is made in three sizes—3, 3½ and 4 foot cut.**



Competitor's Mower with Two Pawls.

Competitor's Mower with Three Pawls.

Osborne Columbia Mower with Four Pawls.



VALUABLE INFORMATION.

THE AGE OF THE HORSE DETERMINED BY THE APPEARANCE OF THE TEETH.

The safest way of determining the age of a horse is by the appearance of the teeth, which undergo certain changes in the course of years. Although it may be impossible to give any rules which will be found to be exactly correct in every case, yet the following classification is generally correct; but exceptions will occur, as, for instance, a noble horse may be taken for younger than he really is, because the strong structure of all the bones makes the teeth also stronger than those of a horse of the same age of an inferior breed.

Eight to fourteen days after birth, the first middle nippers of the set of milk teeth are cut (Fig. 1); four to six weeks afterwards, the pair next to them (Fig. 2); and finally, after six or eight months, the last (Fig. 3).

All these milk teeth have a well-defined body and neck, and a slender fang, and on their front surfaces grooves or furrows which disappear from the middle nippers at the end of one year; from the next pair in two years; and from the incisive teeth (cutters) in three years.

At the age of two the nippers become loose and fall out; in their places appear two permanent teeth, with deep, black cavities, and full, sharp edges (Fig. 4).

At the age of three the next pair (Fig. 5) fall out.

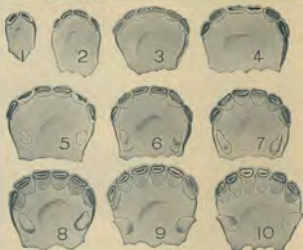
At four years old the corner teeth fall out (Fig. 6).

At five years old the horse has his permanent set of teeth.

The teeth grow in length as the horse advances in years, but at the same time his teeth are worn away, by use, about one-twelfth of an inch every year; so that the black cavities of the center nippers below disappear in the sixth year (Fig. 7); those of the next pair in the seventh year (Fig. 8); and those of the corner teeth in the eighth year (Fig. 9). Also the outer corner teeth of upper and lower jaw just meet at eight years of age.

At nine years old cups leave the two center nippers above, and each of the two upper corner teeth has a little sharp protrusion at the extreme outer corners. (Fig. 10).

At the age of ten the cups disappear from the adjoining teeth.



At the age of eleven the cups disappear from the corner teeth above, and are only indicated by brownish spots.

The oval form becomes broader and changes, from the twelfth to the sixteenth year, more and more into a triangular form, and the teeth lose finally, with the twentieth year, all regularity. There is nothing remaining in the teeth that can afterwards clearly show the age of the horse, or justify the most experienced examiner in giving a positive opinion.

The tusks or canine teeth, conical in shape, with a sharp point and curved, are cut between the third and fourth year; their points become more and more rounded until the ninth year, and after that more and more dull in the course of years, and lose, finally, all regular shape. Mares have frequently no tusks, or only very faintly indicated.



VALUABLE INFORMATION.

BREEDING—This very important subject is too often neglected. A common mistake in breeding is often made, that mares are bred from after they become useless for work, regardless of hereditary diseases which may be transmitted to their offspring. It should be remembered that one of the characteristic laws of life is the reproduction in kind "like begets like."

Both parents should be selected with reference to their individual points of excellence, and also so that the points of one may be adapted to the points of the other; for, although both may be excellent individually, the points which characterize one may actually counteract those of the other, but, if defects exist, the breeder should be sure that it is merely accidental and not natural.

None but sound parents should be bred from; (accidents, of course, are not to be regarded as unsoundness). Both parents should be free from any infirmity relative to a vicious temper or bad disposition, although the points of excellence in one way sometimes counteract the bad points in the other relative to that defect. Great care should be exercised that the same defect does not exist in both. Some knowledge of the parentage of the sire and dam is therefore indispensable.

For ordinary business purposes the best form of a mare to breed from is a short-legged beast, with a deep and roomy chest, wide hips, and so built in every way as to indicate a robust animal, with a strong constitution. Always avoid, if possible, selecting a mare for breeding purposes which has ring-bone, spavin, or any disease that will render the offspring liable to be afflicted with the same by hereditary descent.

The "breed" should be taken into consideration also. If it is desired to raise a carriage beast, select a mare with a good, animated countenance, sprightly, not too nervous nor too sluggish, but with a general muscular structure. The head of the brood mare is a point which should be always regarded, for a mare that has a large head, with a dull, stupid countenance, will not breed a good foal, unless it might be from a very sprightly, ambitious horse. The shoulder blade should be wide and long, extending nearly to the top of the withers, and so well covered with muscle as not to present any undue prominence.

The neck should come out from the top of the withers and not low down; the fore leg should be perpendicular, so that the point of the shoulder and the toe will be in a right line; the foot should be sound and of good, symmetrical shape.

The hips should be long, oval and broad; the hock joint should be well formed, and not of the "cow-hock" or "sickle-hock" kind.

In selecting a stallion the rules which we have already given should be observed, remembering that compactness is quite essential, that much goodness and strength may be condensed into a small space. The shoulder should be well back, with the shoulder blade lying obliquely, except that when it is desired to raise a slow draught horse, a large stallion, with upright shoulders, should be selected.

In summing up the whole matter we would say, if you would be successful in breeding do not breed into the same family and blood, but select a horse of different blood, unless it should be eight or ten generations removed.

Avoid using a horse which is defective in any particular when the mare has the same defect, but select one as nearly perfect as possible in that point. Do not breed small mares with very large horses, for there should be mutual adaptation in size and form, as we have before stated.

CORNS—Corns appear in the angle of the hoof near the heel, and are generally caused by the shoes being worn too long, causing the shell of the hoof to grow over the shoe which allows the weight to press upon the sole; or the shoe gets moved from its proper position, or perhaps never was placed there.

As a general rule the production of corns may be laid to the shoer. Upon cutting away the horn there will be found a red spot; but if very bad, the color will be a dark purple and it will be deeper seated.

Treatment—Dress down the bruised part until quite thin and then put on the shoe, so fitted that there will be no pressure on the part. Have shoe set often, always dressing down the bruised part and the corn will disappear.





Double
Sprockets.
Lower Chains
Run Faster than
the Upper Ones.



Double-Speed
Gathering and
Conveying
Chains.

THE OSBORNE COLUMBIA INCLINED CORN HARVESTER AND BINDER.

Since the invention, years ago, of the first power machine for harvesting corn, the inventive genius of the country has been endeavoring to build, in a compact and simple form, new devices that would render the harvesting of this great and heavy cereal, a light and comparatively easy task. On account of the weight and height of the stalks many serious difficulties had to be overcome, constant and costly experiments were necessary; but ability finally won, the Osborne Columbia Inclined Corn Harvester and Binder was the triumphant result, and several harvests have witnessed the signal discomfiture of every competitor. Sufficient power to move with ease the accurate mechanism of the Columbia, and to fully overcome any tendency to clog, is generated by the drive wheel; it was specially designed to fit all conditions of ground, guaranteeing plenty of traction, and freedom from accumulations of mud; the lugs are large and deep, and their grip upon the soil obviates all possibility of slipping.

The gathering and feeding mechanism is unequalled, of a very distinctive type, and used only on the Columbia. The gathering and conveying chains are of two speeds: the forward chains moving fast enough to pick up down stalks and slightly incline them toward the machine before they reach the cutters; *the rearward chains, with a slower movement, act only on the upper part of the stalks*, while the reciprocating feeders move the butts with a similar speed, and the joint action results in the delivery of the corn in a perfect and slightly inclined upright position to the binder.



Main drive wheel with side extension lugs. The only wheel giving sufficient traction power in all conditions of the soil.

*Sand will rapidly cut out, and weeds will clog chain butt feeders, but our **RECIPROCATING FEEDERS** are not affected by sand or mud, and any weeds or pumpkin vines that may enter the machine with the*

corn, are easily carried through the passage and discharged at the rear.

A perfect condition of the corn is not a necessity to the successful operation of gathering and binding by the Columbia; it has been tried in the rankest growth of weeds and vines, and has proved to be the only machine that will operate easily and successfully under such adverse circumstances; *light and heavy stalks, whether short or long, are gathered with equal facility, the spring arms between the upper and lower conveyors holding them erect, and an upper reciprocating feeder assisting to convey them to the binder.*



The Osborne Columbia Corn Harvester in Canada.



Powerful reciprocating jaws to force the cut and convey the butts. No corn pulled up by the roots. No winding with weeds.



Reciprocating feed jaws reach ahead of the knife, grasp the stalk and force the cut. The stalks, while being conveyed to the binder, are in an upright position.



Our Patented Roller Bearing. Impossible for Rollers to lose out.



The Columbia is Narrow.

cut a long or short stubble, or to level the machine when cutting on an up or down grade.

The narrow width of the machine allows it to harvest corn planted in rows twenty inches or more apart, and to turn about and pick up the row that passes between the team when opening up a field.

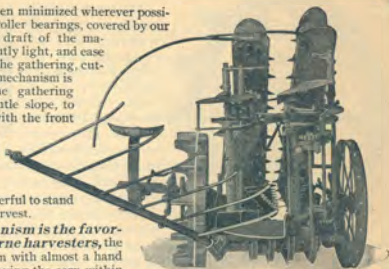
Friction has been minimized wherever possible by the use of roller bearings, covered by our own patents, the draft of the machine is consequently light, and ease of movement of the gathering, cutting and binding mechanism is accelerated. The gathering

arms are long, with a gentle slope, to pick up down corn, and with the front chains quickly raise it to an upright position without tearing it up by the roots.

The main frame is one solid casting, powerful to stand the rough work of the harvest.

The binding mechanism is the favorite type used on Osborne harvesters, the packers gather in the corn with almost a hand motion, moving slowly, laying the corn within the sweep of the needle without tearing off the ears and strewing them over the field. The needle and knoter never fail to bind a bundle. **The deck or bottom is adjustable by a lever**, so that the band can be placed about the center of weight of the bundle, notwithstanding its height, and the butt of the bundle is always square.

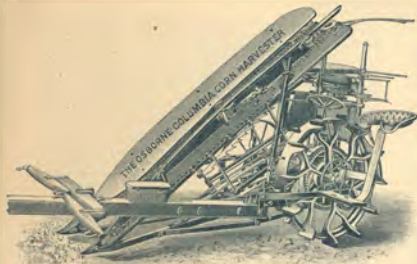
The driver's seat outside the drive wheel, is located convenient to all the levers, so that the harvester can be quickly and easily raised or lowered to



Showing simplicity of Bundle Carrier and how easily attached. Showing Adjustable Steel Bottom of Binder Deck.



Bottom of Stalk Passage and Binder Deck raised and lowered by lever, for long or short corn.



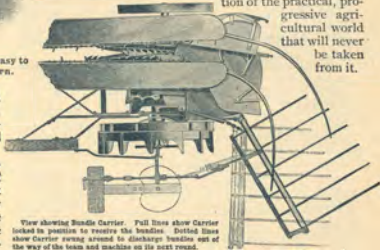
Side view of the Osborne Columbia Inclined Harvester and Binder, with seat easy to mount, and high chain boards, giving great capacity for tall and heavy corn.

THE BUNDLE CARRIER of the **COLUMBIA CATCHES** and holds the bundles, whether large or small, as they come from the binder, and retains them until discharged, at the will of the driver, when they are deposited upon the ground lightly and without injury.

The carrier is locked in its normal receptive position, and a slight upward pull of the driver's foot is necessary to break the lock joint, when the weight of the bundles, assisted by a spring, dumps the carrier at any desired point. By pressing down upon the foot lever, the carrier is again thrown and locked into position to receive bundles; it can be readily swung up out of the way for transport-

tation. It is the simplest, most complete, efficient and practical carrier ever constructed. No corn harvester has ever been produced that possesses in any degree the many valuable features of the Columbia. **Vertical and horizontal binders** have **been driven from the field in repeated contests with it;** for victory is a necessary conclusion with a machine constructed to overcome every difficulty met with in harvesting corn. Perfection of movement of the operative parts, the rearwardly inclined binder preventing the corn from falling forward on any grade, the double speed chains on the long gathering arms, the reciprocating conveyors grasping the stalks and compelling a clean cut, then easily carrying them to the binder, the impossibility of clogging the machine with weeds or vines, the easy draft and certainty of picking up down corn, has given the Columbia a standing in the estimation

of the practical, progressive agricultural world that will never be taken from it.



View showing Bundle Carrier. Full lines show Carrier locked in position to receive the bundles. Dotted lines show Carrier swung around to discharge bundles out of the way of the team and machine on its next round.



VALUABLE INFORMATION.

- No. 1, A female fly about to deposit an egg.
No. 2, The male fly.
No. 3, The egg, its natural size.
No. 4, The egg magnified.
No. 5, The newly hatched bot.
No. 6, The bot fully grown.
No. 7, The head of a bot magnified.
No. 8, The chrysalis.

BOTS—The stomach seems to be the natural nursery for the protection and the propagation of the stomach bot. When the eggs have remained in

the stomach for a year they become a perfect chrysalis (that is the form of a butterfly before it reaches the winged state), and then they release their hold of the stomach and are expelled with the dung. It will be provided with wings in a short time and will fly about, commencing the propagation of its species which passes through the same period of incubation.

They are of two kinds, stomach and fundament bots. The stomach bots are the result of turning horses into pasture in the summer months, and are produced from the eggs laid on the fore legs of the horse by the bot fly.

Symptoms are an unthrifty coat and loss of flesh after running out to pasture.

All horses which run out to grass are quite sure to have bots in their stomachs, and as there is so much misconception about bots and their destructiveness to horses, we copy the results of a series of experiments with bots three-quarters grown.

When immersed in rum they live twenty-five hours; decoction of tobacco, eleven hours; strong oil of vitriol, two hours eighteen minutes; essential oil of mint, two hours five minutes. Were immersed without apparent injury, in spirits of camphor, ten hours; fish oil, forty-nine hours; tincture aloes, ten hours; in brine, ten hours; solution indigo, ten hours. A number of small bots, with one that was full grown, were immersed in a strong solution of corrosive

sublimate, one of the most powerful poisons; the small ones died in one hour, but the full grown one was taken out of the solution, six hours after its immersion, apparently unharmed.

It will be seen by the above experiments that no medicine can be given which will affect the bot that will not destroy the coating of the stomach, and injure or kill the horse. No veterinary surgeon can distinguish the symptoms of bots from those of colic. In fact, there is but little doubt that ninety-nine out of every one hundred cases of belly-ache are no more nor less than colic and not bots, and should be treated as we direct in the treatment of colic.

Treatment—The general condition of the horse should be improved so that the debilitating effects of the bots may not interfere with the general health of the horse. It is generally considered impossible to expel or destroy the bots. Give the following tonic medicines to improve the general condition: pulv. gentian $\frac{1}{4}$ lb., pulv. copperas $\frac{1}{4}$ lb., pulv. fenugreek $\frac{1}{2}$ lb., pulv. elecampane $\frac{1}{4}$ lb. Mix well, and give a large tablespoonful once a day.

FUNDAMENT BOT—Like the stomach bot, this is also the result of running out to grass. Instead of the eggs being deposited on the legs they are deposited on the lips of the horse. They are found in the rectum, and often seen about the anus and under the tail.

Treatment—Injections of raw linseed oil or of tobacco smoke.



CURB—This is one of the many diseases of the hock joint, and consists of an enlargement or gradual bulging out at the posterior part of the hock. (See engraving).

Cause—Curb is generally caused by a strain from galloping on uneven ground, wrenching the limb, prancing and leaping, etc. It is one of the evils which occur among the better breed of horses. Man delights in showing off the animal he is mounted upon, and



VALUABLE INFORMATION.

so it has ever been with man, woman or child; they are always pleased by the prancing of the horse, which, nevertheless, is a very fruitful cause of curb. Pulling horses up suddenly on their haunches is asserted to be a frequent cause of curb.

Treatment—Perfect rest; if hot, bandage it and keep it constantly wet with cold water and saltpetre for a few days until the inflammation has ceased, then apply Kendall's Spavin Cure two or three times a day and rub well with the hand. In some cases it is well to apply the bandage after each application, always applying the bandage as smooth as possible and rather tight. In very bad or very old cases, we would recommend using Kendall's Blister.

COLIC—Colic is a very common as well as a very dangerous disease. There are two forms: Spasmodic and Flatulent Colic. The former is of a spasmodic nature, and will, in severe cases, run into inflammation of the bowels and cause speedy death, if not relieved.

Causes of Spasmodic Colic are drinking cold water when in a heated condition, costiveness, unwholesome food, undue quantity of food, etc.

Symptoms—The horse is suddenly attacked with pain and shows evidence of great distress, shifting his position almost constantly, and manifesting a desire to lie down. But in a few minutes these symptoms disappear, and the horse is easy for a short time, when they return with increasing severity until the horse cannot be kept upon his feet.

A cold sweat generally breaks out over the body. The legs and ears remain at about the natural temperature.

He looks around to his flanks, mostly at the right side, as if pointing out the seat of the disease, scrapes the ground with his forward foot, and will almost strike his belly with his hind foot.

The horse heaves at the flanks; he kicks and rolls, and seems much excited, and sometimes acts as though he wanted to make water, which he cannot do, on account of the urethra being spasmodically contracted. This symptom need not be treated (as it frequently is), for as soon as the horse is relieved of the colic, he will pass water freely. Therefore follow the treatment we give and relieve the colic as soon as possible.

As the disease advances the horse will frequently throw himself down with force, look anxiously at the sides and sometimes snap with his teeth at his sides, and strike upwards with his hind feet as they do many times with inflammation of the bowels.

SYMPTOMS OF

COLIC:

Attacked suddenly.

Intervals of rest.

Pulse not much altered in the early stage of the disease.

Rubbing belly gives relief.

Ears and legs of natural temperature.

Motion gives relief.

Strength scarcely affected.

INFLAMMATION OF BOWELS:

Symptoms come on gradually.

In constant pain.

Pulse small and much quickened, scarcely to be felt many times.

Belly quite tender and sore to the touch.

Ears and legs cold.

Motion increases pain.

Strength rapidly failing.

Treatment—Relieve the pain by giving one ounce sulphuric ether, two ounces of tincture of opium (laudanum) and a pint of raw linseed oil, and if not relieved in an hour, repeat the dose. If there is not relief in a reasonable length of time after the second dose is given, some recommend bleeding from six to ten quarts from the neck vein, but we think it is rarely necessary to do this. Occasionally walk the horse about to excite the bowels to action.

The following mixture is said to be very good:

Take aromatic spirits of ammonia, 1 pint; sulphuric ether, 1 pint; sweet spirits of nitre, 1½ pints; gum opium (made fine), 4 ounces; camphor gum, 4 ounces; assafoetida, 4 ounces. Mix all together and shake frequently for twelve or fifteen days; then filter or strain through flannel and it will be ready for use. Dose: One tablespoonful in a little water, repeated in thirty minutes. A larger dose may be given sometimes in very severe cases.

FLATULENT COLIC, WINDY COLIC, Etc.—The horse is uneasy, hangs the head, and exhibits a few of the general symptoms of spasmodic colic before there is any enlargement of the belly; but more particularly after, for as soon as the belly swells the pawing commences, although it is not so violent as in spasmodic colic.

There is but little rolling or kicking at the belly as in spasmodic colic, and the horse is not inclined to move about much. After from one to four days the belly becomes much increased in size (if the disease is not checked), and the animal becomes restless.

Treatment—Do not bleed for flatulent colic. Try an injection first, and if gas or wind come away with it, the patient will most likely recover soon; but if no benefit is derived from the injection, give the remedies as recommended for spasmodic colic. Let the horse be led around quietly until the medicine has had time to take effect, so as to prevent his falling or rolling, as it might cause rupture of the diaphragm.



THE OSBORNE COLUMBIA HARVESTER AND BINDER.



The Columbia Binder is of Light Draft.

The location of the pole on the Columbia guarantees an absolute balance of the machine, so there is no side draft whatever, and no weight on the horses' necks at any time. The lever for tilting is within easy reach of the driver.

The platform frame and bottom are all steel, light and strong, beyond the possibility of sagging or warping.



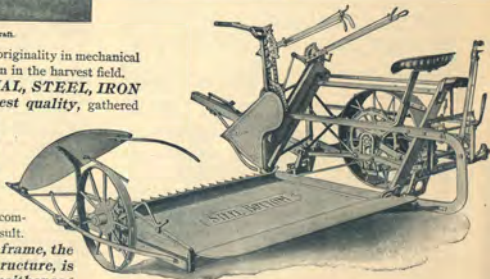
Roller Bearing in Grain Wheel.

A machine embodying more originality in mechanical perfection than ever before seen in the harvest field.

SELECTED MATERIAL, STEEL, IRON AND WOOD, of the finest quality, gathered into a combination and a form that transcends all previous efforts to build a harvester and binder. *None other equals it in lightness, strength and efficiency.*

We invite the most critical comparison without fear of the result.

The channel steel main frame, the base of this unrivaled structure, is strongly braced, and will neither sag nor spring out of a true alignment.



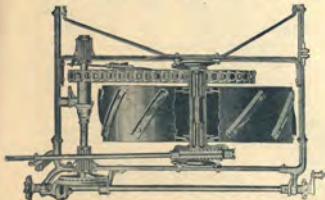
An All-Steel Frame, the strongest and most symmetrical, yet the lightest machine on the market.

A 34-INCH MAIN WHEEL WITH A BROAD TREAD

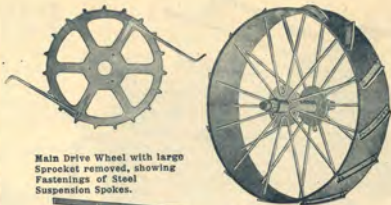
AND

STEEL HAIR-PIN SPOKES.

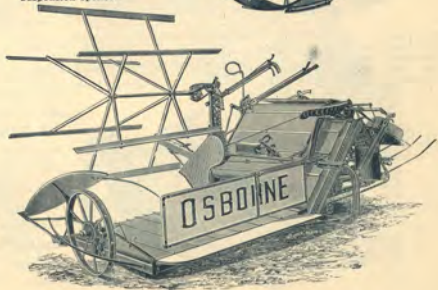
Carries the large sprocket that, through the chain, transmits power to the operating parts; the sprocket is fully braced against all torsional strain by steel stay-rods connecting it with the rim of the drive wheel.



Plan view of Main Frame and Road Wheel, showing Roller Bearings on Main and Second Shafts.

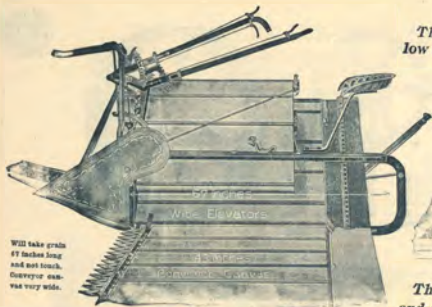


Main Drive Wheel with large Sprocket removed, showing Fastenings of Steel Suspension Spokes.



5, 6, 7 foot cut.





Will take grain
67 inches long
and not touch.
Conveyor can-
vas very wide.

The driver's seat and
foot rest are both ad-
justable to accommodate
length of driver's leg.



Rear View of Os-
borne Columbia Binder
Platform. An easily adjusted
wind break.

The elevators on the Columbia Binder are
low and of easy slope.



Competitors are
obliged to copy our
7th Roller.

The lower elevator, with its broad surface
and unequalled capacity, is assisted by an
**AUXILIARY ROLLER AT THE EDGE
OF THE BINDER DECK.** This roller has al-
ways been a prominent feature of the Osborne Harves-
ter and Binder; no other similar machine has ever used
it, but competitors are now, after years of slumber,
awakening to its value. Proper elevation has never been
a success without it. *It prevents grain from be-
ing pulled down between the canvas and bin-
der deck to clog the running gear of the ma-
chine, or to be wasted over the field.*



The low open end elevators, of a broad and easy slope, and reaching several inches in front of the cutting mechanism, carry the longest or shortest of grain from the platform to the binder deck without waste or clogging. The delivery is clean and regular. There is no jumping or pounding by the upper elevator, for it yields easily to accommodate the bulk of the passing straws.

The entire elevator construction of the Columbia is the ultimate result of long experiment. It is a common sense combination that appeals at once to the farmer, for it saves grain as well as labor. All the rollers are journaled in self-aligning bearings and are easy to oil.

Compare these Elevators with those of the Columbia Binder.

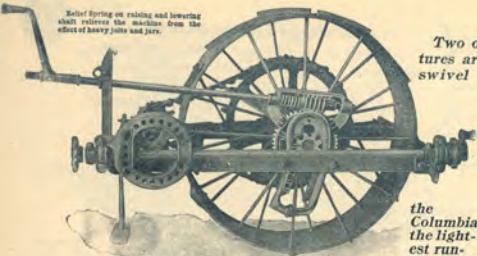


Old style high and steep elevators with obstruction roller between canvas. The elevator is so long it sags in the middle and clogs, a roller is thought necessary to cure it, but "the remedy is worse than the disease."



A so-called "force feed" threshing and dragging the grain over a stationary decking. The canvas carries the grain only part way, and depends upon the pressure of the upper elevator to do the rest.

Relief Spring on raising and lowering shaft relieves the machine from the effect of heavy jolts and jars.



Two of its great features are the perfected swivel self-aligning boxes and our patented roller



Our Patented Roller Bearing. Impossible for Rollers to line out.

bearings. These, in connection with other improvements, make

the Columbia the lightest running binder made.

Two horses draw it with ease. **THE RAISING AND LOWERING DEVICE IS SO FINELY BALANCED THAT A VERY SLIGHT EFFORT ONLY IS REQUIRED TO OPERATE IT.** Any jars and jolts resulting from travel over rough fields and roads are counteracted by the heavy relief spring on the raising shaft.



A perfect Self-aligning Bearing; prevents heavy draft.

The machine can be thrown in or out of gear without the driver changing his position. All parts of the binder mechanism are easy of access for oiling through a small trap door in the binder deck.

SELF ALIGNING BEARINGS.



Self-aligning Bearings and Removable Boxes prevent Cramping or Binding and Insure Light Draft.

THE REEL.



Reel Jack and Arm thrown down and back.

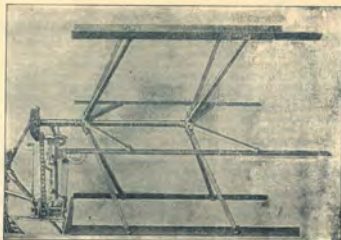
The Columbia Reel has stood the severest tests in numerous harvests without even a suspicion of failure, one lever necessitating only one hand to move the reel up or down, forward or back.

It will reach over and gather in the tallest grain, and if lowered forward will pick up tangled and lodged grain with equal ease. It can also be made to sweep close to the knives to save the shortest growth.

A double sprocket allows the operator to give a fast or slow speed to accommodate the condition of the crop, whether it is light or beaten down and tangled.



Simple and Rapid Working Raising and Lowering Device—a child can work it.



A Perfect One-Lever, Four-Motion Reel; light but very strong; mounted on Steel Shaft, with two hubs for Reel Arms.

The entire cutting mechanism is so accurately fitted, that when the knives are cutting under the push of the straight drive pitman, the absence of all pounding and straining is at once apparent.

The binder attachment has a chain drive, direct and simple. The packers run one-quarter slower than those on any other harvester, thereby shelling less grain. The trip operates automatically to make small or large bundles governed by the weight and dryness of the straw.

The knotter is as perfect as it is simple, and as its action is timed with the needle the movements of the two are absolute. Every adjustment is provided to regulate the machine to the harvest and to reduce draft and friction to a minimum.

Our sheaf carrier has many features that recommend it to the farmer as the best and our truck for transportation is quickly and easily attached when needed.





VALUABLE INFORMATION.

THE HORSE—Management and Care in Sickness.

Our Domestic Animals have for so many generations been under conditions entirely contrary to their nature, that even they have changed somewhat in their habits and requirements. Our climate is far different from that in which they are found in their native state. The use to which man has put the noble horse is to blame for most of his diseases. In his native state the diseases which we find so troublesome are entirely unknown. The sooner sickness is recognized and the proper remedies used, the sooner the animal will be restored to health. But to recognize disease it is obviously necessary to know the animal when well. If nothing is known regarding the natural pulse, how can one expect to know whether the heart beats regularly and natural or not. Study the condition of the animal in health as to pulse, number of respirations, color and quantity of the excretions, and remember if these change there has come a time to be specially observant of the actions of the animal so as to determine the cause. Should these changes be the result of disease, determine its nature and be governed accordingly. A quick recognition of an ailment and promptness in treatment will the sooner restore health and less will be the liability of death and loss.

FIRST REQUISITES—Provide the animal with plenty of pure, fresh air, always avoiding draughts. Make the stall as comfortable as possible; cool in summer and warm in winter. Keep the temperature as nearly 55 to 60 degrees as possible. See that the drainage is good, and the place dry.

Box Stall—A box stall not less than 10 feet square is best, and should be provided with a low half door over which the animal may drop his head, if so inclined. Windows in the stall should be darkened when animals have nervous diseases or eye troubles.

Good Bed—Provide plenty of fresh, clean straw or saw-dust. Some practical men prefer to have a bed made of old straw, which has been carefully collected and dried. The reason for this is that it makes a softer and yet a more compact bed, and there are no stiff ends of new straw to annoy and irritate the sick animal.

Remove Shoes—If a horse is liable to be sick for any length of time, or is seriously ill, remove all the shoes, as it will be much more comfortable for the animal.

FOOD—Care and skill are needed in preparing the food, regulating the diet and tempting the appetite of the sick. The food should be simple, nutritious and easy of digestion. Change food often and give it in small quantities frequently. Food is rendered

more easily digestible by being cooked. Give some green food whenever it can be procured. Scald all grains, such as corn, oats, barley, bran and middlings by pouring on boiling water. Then cover and allow to steam until cold, then feed. It is always best to have the grain ground, it being more easily digested.

Mashes—What are commonly known as "Mashes" are very useful in feeding sick horses and cattle, but they should be fed in small quantities and carefully prepared. Feed a mash from the tub in which it is mixed, because if placed in the manger, the part remaining behind often sours and renders all that is put in the manger thereafter unfit to be used.

Bran Mash—Mix two quarts of bran with enough boiling water to cover; add salt, stir thoroughly and allow to cool.

Linseed Mash—Boil a half pound of unground flaxseed in two quarts of water until it is reduced to about three pints. Pour this over bran instead of water and mix.

Bread Mash—Soak a loaf of bread, broken into pieces, in fresh milk until it is soft and can be made fine. Stir and mix.

Fresh Water—Water should always be within reach of the animal, especially if there is any fever. A small quantity of powdered alum added to a pint of water will purify it by precipitating the impurities. Some animals seem to be given to scouring. To such, water should be given in small quantities and frequent; or what is a better plan, leave water always before such animals. Animals watered at intervals drink much more than when always supplied. A smaller quantity of water taken into the system lessens the secretion of the internal organs and decreases the tendency to scour.

Hand-rubbing—Rubbing the legs is very useful to relieve any fullness caused by overwork or strain, or the lack of exercise. The friction excites the blood vessels and absorbents to greater action. Gentle hand-rubbing of the skin and sponging of the nostrils with weak vinegar and water is many times very refreshing to the sick.

Cleanliness—A stall that has been occupied by a sick animal should be thoroughly cleaned, washed with a hot antiseptic solution, and whitewashed before another animal is allowed to occupy it. The sheath should always be carefully cleaned at the beginning of any serious sickness, and occasionally thereafter if the trouble lasts any length of time.

Antiseptics—In case of wounds it is often the case to find that poisonous germs existing in the air are absorbed, and the wound does not heal properly because of the germs producing putrefaction



VALUABLE INFORMATION.

in the injured tissue. Blood-poisoning may follow the absorption of the microscopic organisms. Certain agents have the power of destroying these poisonous germs and are known as "antiseptics."

How to Use Antiseptics—Some of the most valuable antiseptics are among the *deadliest poisons*, even in very small quantities. They should always be used, but with care. Corrosive Sublimate (bichloride of mercury) is the most valuable known. It is in the form of small, white granules, and is very poisonous. It is used by dissolving three grains in a pint of hot water. This solution is used in washing and cleansing the wound. Carbolic acid, salicylic acid, blue vitriol, iodoform, sugar and alum, are all among the antiseptics.

Disinfectants are agents which have the power of destroying or neutralizing infectious matter which is the product arising from an animal having a contagious disease, and a variety of other sources, as sewers, cesspools, decaying matter, etc. Disinfectants are used in solid forms or in solution.

A Few Disinfectants—Fresh air and cleanliness are the first. To aid these we have:

Brimstone, (rolled sulphur) for fumigation.

Cropperas (sulphate of iron), 1½ pounds dissolved in a gallon of water, to be used in cesspools, sewers, and to be thrown over any infected matter.

Common salt and sulphate of zinc, four ounces of each to a gallon of water, is valuable to wash all blankets that have been used on a sick animal.

Corrosive sublimate, 16 grains to a quart of water, is used to mix with the nasal discharges in case of glanders. The amount should equal the amount of discharge.

Deodorizers. There are very offensive odors around many a stable and out-house. There are substances which are capable of destroying or masking these odors and are known as deodorizers. They may or may not have the power of destroying contagious matter. The simple deodorizers are chloride of zinc and chloride of lime.

WATERING HORSES WHEN WARM.

There is a common notion among users of horses, that if a horse is warm he should not be allowed to drink, many claiming that the "first swallow" of water either "founders" the animal or produces colic. This is not true. It does not matter how much heated the horse may be, it is always safe to give him a half dozen

swallows of water. If this water is given just before being put in the stable, the animal should be immediately supplied with a few pounds of hay, and should not be fed grain until the animal has rested about an hour. The danger is not in the "first swallow," but is always due to the large quantity which the animal will take when warm, if allowed to drink without restraint. Over one-half of the digestive disorders are undoubtedly caused by improper feeding and watering; hence one can readily see the importance of a proper understanding of these subjects.

Quantity of Water Required—When horses can get water whenever they wish it, they never drink enough at one time to injure them. Where the horse is dependent upon his attendant for water, he commonly requires about eight gallons a day. This will vary with the class of food. If green food is used, a portion of this is supplied and a less quantity needed than when fed on dry hay and grain. The horse should be watered at least three times a day when idle, and oftener when at work. Remember always to water before feeding.

Digestion of Two Kinds—In the horse as well as in man digestion takes place in the stomach and intestines. The food after passing into the stomach undergoes a change before passing out to the small intestines where the process of digestion is finished. The change taking place in the stomach is called, stomach digestion, and that in the intestines, intestinal digestion.

Feed Oats After Hay and Straw—The time required for stomach digestion varies with the different foods. Hay and straw are digested and pass out of the stomach more rapidly than oats or other grain. If oats are fed first, and are followed by hay, the hay soon passing onward into the intestines will carry along with it oats that are not yet prepared for intestinal digestion thus causing a loss of food. Another reason for feeding hay first, (more particularly if the horse is very hungry or tired from overwork) is that it takes more time to masticate the hay and the horse cannot bolt it down as it would grains. Water should not be given soon after feeding, as it washes the food from the stomach before it has had time for proper stomach digestion.

Common Error of Feeding—An error that produces many disorders of the digestive system, is to Feed Too Soon After a Hard Day's Work. A very small quantity of hay may be given but grain should not be fed within less than an hour.



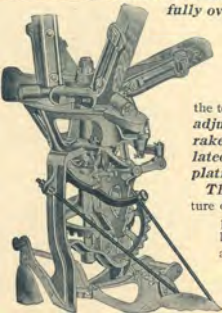
THE OSBORNE COLUMBIA REAPER.

A MACHINE WITHOUT A PARALLEL IN REAPER HISTORY. Every part of it is constructed of the best and strongest material procurable, with the closest attention paid to the fitting, operation and adjustment.

The platform, made of selected timber, is thoroughly braced; any tendency of the front sill and cutter-bar to sag or warp is fully overcome by a steel truss rod.

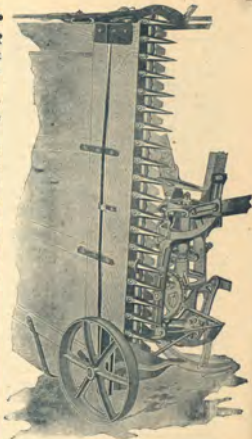
THE GEARING is of well tested strength, and being located with the rake-head and main frame close to the drive wheel, its compactness tends to the perfect balance of the machine and the total elimination of side draft. *By the adjustable brace rods of the high rake-head the rakes can be regulated to make a clean sweep of the platform, leaving a perfect gavel.*

The tripping device is a notable feature of this machine; it is extremely simple and accurate, an adjustment of the latch regulating the action of the rakes and allowing them to operate at intervals, or successively, as the driver may desire. When the crop is thin, and a proper sized gavel can only be obtained by allowing the cuttings to accumulate on the



Rake-Head Complete, Showing the Lever on Automatic Trip, and Adjusting Brace Rods.

platform, the rakes can be tripped into action by the foot of the driver at will.



Position of Grain Wheel when Platform is Folded. See Steel Truss Rod.



High
Inside Divider,
protects
Rake Head
from winding
with straw.
5-foot cut.

The driver's seat, supported from the main axle, is close to the adjustments, so that the team and machine can be under perfect control at all times. The seat is adjustable to allow the driver's weight to balance the machine, and can be taken off by removing a bolt.



Angle of Seat can be changed quickly and easily, to
Suit the Driver.

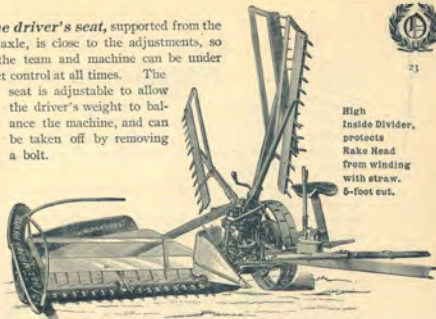
The main wheel is strong and solid, and gives to the reaper mechanism such perfect running as can only come from great power easily delivered. The gear and pinion are fully protected from dirt or clogging.

The ease with which the raising, lowering and tilting mechanism can be operated cannot be improved upon. It is characteristic of the Osborne Reaper.

All possibility of clogging the gearing is prevented by the height of the inside divider.

For transportation on the road or through narrow gateways the platform can be quickly folded.

The thorough efficiency of the Columbia has been proven in innumerable contests, where its lightness, strength, ease of adjustments, speed in cutting and forming of gavels have made it victorious.



Easy and convenient Raising and Lowering
Device for Grain Wheel.



THE OSBORNE No. 8 LIGHT REAPER

Is more widely known wherever grain or grass is harvested than any other reaper ever manufactured. It holds a place in the estimation of the practical agriculturists all over the world that cannot be overcome by competition.

It is thoroughly reliable under all conditions, and its light draft and weight give it an added value. It is an automatic side delivery reaper, and the action of the rake arms can be adjusted to act in succession or at intervals as the driver wishes. The balance is perfect, and the amount of power required to operate it is very small when compared with competing machines.

The extension track renders it possible for the rakes to be so adjusted as to sweep the gavel more completely from the platform than on any other reaper. But the feature which has won for our No. 8 the greatest measure of its popularity is the motion of its rakes—a *rolling motion which eases the delivery of the gavel and deposits it on the ground straight and in good condition to bind.*

It is an effective and superior harvester, made of the highest grade of material and having all the elements of perfect adjustability wherever necessary. In endurance, quality and quantity of work it has no equal.





THE OSBORNE SELF-DUMP HAY RAKE.

EVERY HOUR THAT GRASS REMAINS ON THE GROUND AFTER BEING CUT AND DRIED A PER CENT. OF ITS NUTRITIVE VALUE IS LOST; to prevent this, it should be quickly and cleanly gathered, a process best done by the Osborne Rakes. *Our Self-Dump Rake has thoroughly won its title as the leader; IT IS LIGHT, STRONG, DURABLE, EASY TO OPERATE,* and **WITH AN UNLIMITED CAPACITY FOR WORK.**

MADE IN FOLLOWING SIZES:

8-foot, with 20 teeth	10-foot, with 24 teeth	12-foot, with 28 teeth
8-foot, with 28 teeth	10-foot, with 32 teeth	12-foot, with 36 teeth



Section of the Osborne Double Hub Bicycle Wheel; 20 Spokes.



Section of the Single Hub Wheel Used on other Rakes; 12 to 16 Spokes.

THE WHEELS, with twenty strong steel spokes and steel tires, are peculiar to the Osborne; they possess all the elements of strength always found in wheels constructed on the bicycle wheel suspension principle. They have double hubs, and are interchangeable.



Our Patent Whiffletree Helps the Horse to Turn the Rake.

All injury to the horses' shoulders by the shafts is entirely prevented by the use of our patented whiffletree. There is no chafing and gouging, such as is likely to result when the shafts are pushed around when turning the rake. It equalizes the draft thoroughly, pulling directly from the collar.



Can be set to dump the teeth to an extreme height, or to drop the teeth close to the windrow, whether using a fast or slow walking horse, leaving no unraked hay.

*The **TEETH**, the most important part of the rake, are made of oil tempered, highly carbonized steel; they are secured to the angle bar rake-head by malleable iron clips; they ride independent of each other, and being extremely flexible they will gather hay over any surface; the flattened points prevent them digging into the soil, stirring up dust and grit; no hay is wasted, it is all gathered bright and clean; the single coil in the tooth increases its flexibility and prevents breakage when an obstacle is encountered while raking.*

*It remained for us to devise a means for **EFFECTIVELY PREVENTING ROLLING and ROPING of THE HAY** when raking a thin crop, and the adjustable check teeth are a complete remedy for this annoying evil; no other device has ever been successful. It is found only on Osbourne Rakes.*

When, by reason of a soft condition of the ground, *it is desired to raise the points of the teeth above their normal raking position, it can be quickly and easily done* without the aid of tools by changing the connection between the foot lever and dumping mechanism as shown in the illustration.

The seat is adjustable and the combination shafts and pole can be quickly changed, so a single horse or a team can be used as desired.

Quick adjustment for changing the raking position of the teeth. Four holes.



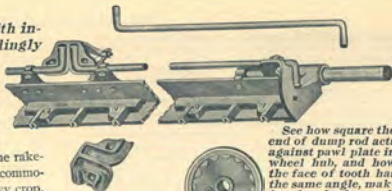
Our new Floating Check Tooth prevents hay from rolling and roping.



THE SELF-DUMPING DEVICE, with interchangeable dump rods, is an exceedingly important and valuable mechanism found only on our rake.

It means double the amount of utility of other rakes; only a slight pressure of the foot upon the lever is necessary to throw the dump rods into action, where they remain, held by the teeth in each hub, until the highest point of elevation of the rake-head is reached and the hay is dropped. To accommodate the height of the dump to a light or heavy crop, it is only necessary to adjust the snub iron against which the dump rod casting strikes when dumping.

It is very accurate in operation, having an exactly similar action



See how square the end of dump rod acts against pawl plate in wheel hub, and how the face of tooth has the same angle, making the wheel, as well as the dump rods, perfectly interchangeable.



**THE OSBORNE
HAND-DUMP RAKE.**

An implement that is built for long and satisfactory service.

MADE IN SIZES:

8-foot, with 20 teeth
10-foot, with 24 teeth

8-foot, with 25 teeth
10-foot, with 30 teeth

whether raking straight ahead or when turning; the teeth always drop close to the windrow, and the rapidity of drop can be varied to suit the speed of the horse. This is a valuable point, and will be readily appreciated by practical haymakers.

Every device that continued and careful experiments have proven of value has been added to this rake, until it is beyond comparison, the most perfect implement of its kind ever constructed. It is very light, yet of great strength, and possesses fully double the capacity and durability of any other rake that presumes to compete with it.



VALUABLE INFORMATION.

Horse has a Small Stomach—An examination of the ANATOMICAL MANIKIN OF THE HORSE shows that the horse has a very small stomach in proportion to his size. This proves to us that the horse should be fed in small quantities and often. The disproportion between the size of the stomach and the amount of water usually given at one time shows plainly that the horse should always be watered before feeding. Feed at least three times a day, and not wholly on concentrated food. Bulky food must be given to detain the food in its passage, through the small intestines, so that it can be thoroughly digested and the nutriment absorbed.

Ten Pounds of Hay a Day—A horse that is fed twelve quarts of oats a day, or other grain in proportion should be allowed ten to twelve pounds of good timothy hay a day. Do not keep horses that are at light work entirely on hay, if you do they will soon become "pot-bellied," fall off in flesh, and will not thrive. Even colts unless fed with some grain, grow up long, lean, and gawky, and never make as good horses as those accustomed to grain.

Hay—The best hay for horses is timothy. Hay from six months to a year and a half old is best. It should be of a greenish color, crisp, clean and fresh. New hay is hard to digest, produces "slobbering" and some times diarrhea. Mow-burnt hay produces disorders of the kidneys and bowels. Musty or moldy hay has often been said to produce that peculiar disease variously known as cerebro-spinal-meningitis, putrid sore throat or choking distemper.

Straw—The straws are not extensively fed in this country, and when used at all they should be cut and mixed with hay and ground or crushed grains. Wheat, rye and oat straw are the ones most used, and of these oat straw is the most easily digested and contains the most nourishment. Pea and bean straw are occasionally fed to horses, the pea being preferable according to most writers.

Chaff—Wheat and rye chaff should NEVER be used as a food for horses. The beards frequently become lodged in the mouth or throat, and are productive of more or less serious trouble. In the stomach and intestines they often serve as the nucleus of the "soft concretions," which are to be described when treating of obstructions of the digestive tract. Oat chaff, if fed in quantities and mixed with cut hay or corn-fodder, is very much relished by horses. It is not to be given in large quantities, as a troublesome and sometimes

fatal diarrhea follows the practice of allowing horses or cattle free access to a pile of oat chaff.

Grains—Oats take precedence of all grains as a food for horses, as the ingredients necessary for the complete nutrition of the body exist in them in the best proportions. Oats are besides more easily digested and a larger proportion absorbed and converted into the various tissues of the body. Care must be taken in selecting oats. According to Stewart the best oats are one year old, plump, short, hard, clean, bright and sweet. New oats are indigestible. Kiln-dried oats are to be refused, as a rule, for even though originally good this drying process injures them. Oats that have sprouted or fermented are injurious and should never be fed.

Wheat and Rye—These grains are not to be used as food for horses, except in small quantities, bruised or crushed, and fed mixed with other grains or hay. If fed alone, in any considerable quantities, they are almost certain to produce digestive disorders, laminitis "founder" and similar troubles. They should never constitute more than one-fourth of the grain allowance, and should always be ground or crushed.

Bran—The bran of wheat is the one most used, and its value as a feeding stuff is variously estimated. It is not to be depended upon if given alone, but may be fed with other grains. It serves to keep the bowels open. Sour bran should not be given. It disorders the stomach and intestines, and may even produce serious results.

Corn—This grain is not suitable as an exclusive food for young horses, as it is deficient in salts, and we must be very particular in giving corn to a horse that is not accustomed to its use. It must be commenced in small quantities and very gradually increased. There is no grain more likely to produce acute indigestion than corn if these directions are not observed.

Linseed—Ground linseed is occasionally fed with other foods to keep the bowels open and to improve the condition of the skin. It is of particular service during convalescence, when the bowels are sluggish in their action. Linseed tea is very often given in irritable or inflamed conditions of the digestive organs.

Potatoes—These are used as an article of food for the horse in many sections. If fed raw and in large quantities they often produce indigestion. Their digestibility is favored by steaming or boiling. They possess, in common with other roots, slight laxative properties.



VALUABLE INFORMATION.

Beets—These are not much used as food for horses.

Carrots—These make a most excellent food, particularly during sickness. They improve the appetite and slightly increase the action of the bowels and kidneys. They possess also certain alterative properties. The coat becomes smooth and glossy when carrots are fed. Some veterinary writers claim that chronic cough can be cured by feeding carrots. Carrots may be considered as very beneficial if fed regularly in small quantities.

CATTLE.

Almost all the diseases of cattle, arise either from exposure to wet and cold weather; from their food being of a bad quality; or deficient in quantity; or from being changed too suddenly from poor, unwholesome keep, to rich pasture.

Cattle in their native state are almost free from diseases, but man, breeding with some particular object in view, has often weakened the constitution of the breed, and that, together with their manner of feeding and care make them liable to disease. The following general facts are appended to show the class of food and the manner of feeding that may cause disordered digestion and other diseases.

Coarse, fibrous hay overtaxes the digestive powers, irritates the mucous surface of the stomachs and bowels and may cause an inactive condition of the stomachs, or may lead to dysentery from its effect on the bowels.

Timothy hay, while good feed for horses, when fed to cattle that do not have much exercise, will lead to constipation. Hay fed to cattle should contain clover on account of its laxative effects, because this will aid in keeping the bowels in a natural condition.

Finely ground food, such as corn meal and middlings, should not be fed alone. They form in large balls in the stomach and resist the action of the digestive fluids, often causing very severe attacks of indigestion. Feed all finely ground grains on cut hay.

Hay badly cured or often exposed to rain while drying is innutritious and may produce inflammatory diseases of the stomach and bowels.

Ergot in hay will produce gangrene of the extremities. If there is a suspicion that there is ergot in the hay, feed roots to the cattle, as they counteract in a measure the effects of the ergot.

Rusty straw and musty oats will produce disease if fed to cattle.

Smut on corn diminishes its nutritive qualities and cattle fed on it lose in weight, sometimes ending in inflammation of the fourth stomach.

Frozen turnips and potatoes produce dangerous attacks of indigestion when eaten by cattle.

Grass wet by cold dew or rain, or covered with hoar-frost, is dangerous to cattle.

Eating in excess in luxuriant pastures will produce indigestion. Therefore, when cattle are first turned into such pasture, let them remain only a short time each day, until they have become accustomed to the richer and more tempting herbage.

Too cold or too warm water may lead to weaken the digestive organs. Ice water, or very cold water, often produces cramps in the fourth stomach.

Mixing salt in the food is not considered expedient, as more may be given than the animal demands, thus causing undue thirst. Better have rock salt within their reach, so that they can get what nature demands.

STANDARD RECIPES.

Good Samaritan Liniment or Pain Killer—This is one of the best liniments made. It affords relief in bruises, sprains, burns rheumatism, neuralgia and headache.

- 2 quarts 95 per cent. Alcohol.
- 1 ounce Balsam of Fir.
- 1 ounce Oil Sassafras.
- 1 ounce Tincture Catechu.
- 2 ounces Oil Origanum.
- 1 ounce Spirits of Turpentine.
- 1 ounce Chloroform.
- 1 ounce Oil Hemlock.
- 1 ounce Tincture Guaiacum.
- $\frac{1}{4}$ ounce Gum Camphor.
- $\frac{1}{2}$ ounce Oil Wintergreen.

Dissolve the gum camphor and oils in the alcohol before adding the other ingredients.

Arnica Liniment—This is a valuable liniment for wounds, stiff joints, rheumatism and sprains.

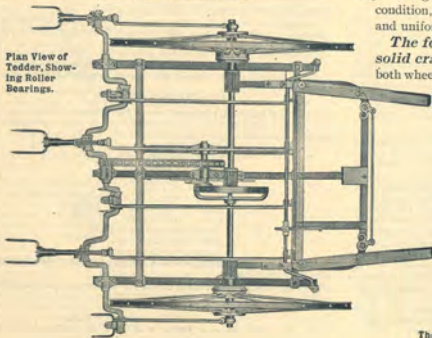
- 2 pint Sweet Oil.
- 2 tablespoonfuls Tincture of Arnica.

The leaves may be used instead of the tincture by putting them in the oil and heating over a slow fire. Then strain.



THE OSBORNE TEDDER.

The value of hay depends largely upon the manner in which it is cured. **TIME IS MONEY.** *Farmers cannot afford to be without tedders, for they not only save time when it is valuable but increase the value of the hay.*



With the use of the Osborne Tedder the proper curing of the crop is assured. It is indispensable to a successful harvest, earning its cost in a season by the saving of time and the added values received for perfect hay. The grass is tossed to fall lightly in open and loose condition, so that the air circulates freely, and a rapid and uniform cure results.

*The fork arms are all journaled upon a solid crank-shaft, driven with the full power of both wheels by a chain drive operating direct from the center of the axle. A divided crank-shaft means imperfect alignment of the forks, resulting in a loss of machine balance, an increased draft and imperfect work. **THE OSBORNE CRANK-SHAFT IS SOLID,** consequently these faults are absent, and the work of the forks is perfect; whether the machine is tedding straight ahead or turning a corner, it is impossible for them to get out of alignment.*



The Osborne Roller Bearing—Three on Tedder Axle.

The crucible spring steel of which the forks are made is a guarantee of their quality. They are journaled upon tubular steel arms, and their flexibility is reinforced by strong coiled springs. The points of the forks are back of a perpendicular line through their pivots. This is a feature peculiar to our tedder. It saves the forks from strain or breakage by their instant give when striking an obstruction.

The outside forks ted any hay which the



The Osborne All-Steel Center Drive Hay Tedder. Light, strong and effective. Made with 6 and 8 Forks.

THE OSBORNE FORK.



The point of the Osborne Tedder Fork is back of the pivot joint. Forks will not bend or break when striking an obstruction.

The ordinary Tedder Forks.



wheels pass over. The rear of the machine can be adjusted high or low by a lever close to the driver. A strong coiled spring on the front of the frame absorbs all jar occasioned by travel over rough ground.

A foot lever throws the power in and out of gear.

The driver's seat is adjustable. All the bearings are easy to oil.

Our patented roller bearings are used on this machine, reducing all friction to a minimum. Combination pole and shafts are furnished with every tedder.





VALUABLE INFORMATION.

Chillblain Liniment—This will allay the itching, burning sensation, and by proper care effect a cure.

- 1 ounce of Liquor of Subacetate of Lead.
- 2 ounces of Spirits of Camphor.

Mix thoroughly and apply at least four times a day.

Chloroform Liniment—This is one of the best applications for neuralgic and rheumatic pains.

- 1 ounce of Chloroform.
- 1 ounce of Ether.
- 1 ounce of Spirits of Camphor.
- 1 ounce of Tincture of Opium.
- ½ ounce of Tincture of Cayenne Pepper.

Bathe frequently, or until pain becomes subdued.

Camphor Liniment—As an application it is a very powerful outward stimulant. It is most valuable in chronic rheumatism and other painful affections. It is especially valuable as an outside application in sore throat or diseased bowels.

- 1 quart of Olive Oil.
- 4 ounces Gum Camphor.

Mix and put the bottle in hot water. Keep in hot water till the camphor is thoroughly dissolved. Its full strength and benefit is best obtained if the parts treated are covered with oil-silk after the liniment is applied.

Spirits of Camphor—A quantity of this remedy should always be on hand ready to be used as an external application for sprains, local pains and stitches.

- 1 quart of Alcohol.
- 4 ounces of Camphor Gum.

The gum will readily dissolve in the alcohol. It should be applied by rubbing the painful part with the hand. Cover the part after rubbing with flannel wet with the camphor.

Camphor may be beaten for some time in a mortar and not be reduced to a powder, but if a few drops of the spirits of wine be added it may be easily made fine. Adding water to camphor dissolved in alcohol turns it white.

Camphor Ointment—This is an ointment which will be of benefit to ripen (bring to a head) tumors.

- 2 ounces Adeps (Lard)
- 1 ounce powdered Gum Camphor

Mix thoroughly. This to be applied by putting on cloths and placing over the sore.

Pile Ointment—This when faithfully used will relieve the itching and burning sensation so common to this annoying disease. Keep the bowels loose and regular and be careful of the diet.

- 2 ounces of Adeps (Lard)
- 1 ounce of White Wax.
- 3 scruples powdered Opium.
- 6 scruples Flour of Sulphur.

Melt together the Lard and Wax, stirring constantly till cold, then add the other ingredients.

Wonder Ointment—This ointment should be in the cupboard of every family, to use in case of burns, scalds, cuts and sores. It is healing and soothing. Gather your roots while you can and prepare a few boxes.

- 1 pound root of Yellow Dock.
- 1 pound root of Dandelion.
- ½ pound root of Plantain.

Put to steep in water and extract the juices. Press out the juices after steeping. Strain carefully and simmer the liquid till half its original bulk. Add some oil and fresh butter and again simmer until all the water is gone. Then box and keep ready for use.

Iodoform Ointment—This remedy is largely used to heal sores caused by syphilis.

- 1 dram Iodoform.
- 15 drams of Adeps (Lard).

Add sufficient Alcohol to make into an ointment. This has been used with success in many very severe cases.

Tar Ointment—This is a popular remedy among the southern people, who use it for scalds and burns.

- 6 ounces of Tar.
- 8 ounces of Mutton Tallow.

Melt together and stir till cold. It is an excellent remedy for scald head and ringworm. For scald head, first wash the head well, then apply the ointment.

Carbolic Ointment—This salve should be used when there is the least danger of "proud flesh." It is what is known as the antiseptic treatment. That is the treatment that will destroy the germs of the air that often are absorbed into wounds and prevent their healing.

- 1 fluid dram of carbolic acid.
- 4 ounces Adeps (Lard).

Melt lard at a gentle heat, add the carbolic acid and stir till cold.



VALUABLE INFORMATION.

Cucumber Ointment—A soothing ointment, good for allaying the feverish condition of the skin or chapped hands or lips.

- 6 fluid ounces Oil Sweet Almonds.
- $\frac{1}{2}$ ounce of White Wax.
- 2 ounces of Spermaceti.
- 1 fluid ounce of Glycerine.
- 4 pounds of Green Cucumbers.

Chop the cucumbers into small pieces and mash them in a stone jar; let them lie in their own liquor over night, then press and strain. Melt the spermaceti and wax together and add the almond oil. Set the pan in which the melting ingredients are into a larger pan of boiling water. When melted, add to it the strained cucumber liquid, stirring all the time so as to have them thoroughly mix. Set on cellar bottom or in an ice box till cold, then stir with wooden spoon, when the watery portion of the cucumber will separate from the ointment; pour off this watery portion and then mix the glycerine with the ointment without heating by thoroughly working with a spoon or the hands. Put into jars and cover with a few drops of rose water. Keep in a cool place.

PLASTERS AND BLISTERS.

Plasters—These are extensively used for holding together the edges of cuts or wounds. They are also, according to their composition, used to relieve pain, reduce swellings or soothe inflamed surfaces. Substances which, when applied to the skin, produce a redness and increase of heat, are often the main part of what is commonly called a plaster.

Blisters—A substance applied to the surface of the body to cause a secondary morbid action, with the view of relieving one already existing, is called a blister.

Adhesive Plaster—This is the well-known adhesive plaster, so much used for drawing together the edges of a cut or wound and holding them in position till healed. It is also used to protect from the air and further injury portions of the body when the skin has been accidentally removed. It is slightly stimulating, and it is supposed to aid in the healing process.

- $\frac{1}{2}$ pounds Litharge.
- 1 quart of Olive Oil.
- 1 gill of Water.

Mix with an iron spoon in a well-polished copper kettle the litharge in water, then add the oil and boil, stirring all the time until the plaster is sufficiently hard when cold. This process requires considerable time. Take:

- 5 ounces of above mixture.
- 1 ounce of Resin.

Mix by a moderate heat and spread thinly on muslin or linen. A thin paper moistened with olive oil and then wiped dry may be laid over the surface and the plaster rolled up. Put in an air-tight tin tube and be ready in emergencies.

A Corn Cure—Cut a piece of paper the size of a one cent piece, and in the center of this cut a hole the size of the corn. Put this over a piece of adhesive plaster cut to the same size and warm the plaster shown by the hole. To this small portion add a little nitrate of silver. Remove paper and apply to corn. A couple of applications seldom fail to cure.

Strengthening Plaster—This is an excellent plaster to relax the muscles, and for weak joints caused by sprains and bruises.

- 6 ounces of First Part of Adhesive Plaster.
- 1 ounce of White Resin.
- $\frac{1}{2}$ ounce each Yellow Wax and Olive Oil.
- 1 ounce Red Oxide of Iron.

Rub the oxide well into the oil, melt the other parts and add. Mix well together. Spread the plaster on leather, cut into narrow strips and wind around the sprained joint.

Mustard Plaster—This will furnish an ever ready mustard plaster which is far superior to the untidy, annoying wet plaster so often used.

- $\frac{1}{2}$ pound Pulverized Black Mustard Seed.
- 6 ounces Mucilage of Gum Arabic.

Cover paper or smooth cloth with the mucilage and dust over the surface the powdered black mustard seed. The strength will depend upon the amount dusted upon the surface. When dry put away in air-tight fruit jar. When wanted, plasters of any size can be cut from the roll.

Spanish Fly Blister—This is a strong and active blister, which will act quickly and powerfully.

- 6 ounces Burgundy Pitch.
 - 2 ounces of Beeswax.
 - 9 ounces Venice Turpentine.
 - 6 ounces of Cantharides.
 - $\frac{1}{4}$ ounce of powdered Mustard.
 - $\frac{1}{4}$ oz. of powdered Bl'k Pepper.
- Mix over heat but it must be less than boiling water.



The Gangs can be reversed from an in-throw to an out-throw.

THE OSBORNE COLUMBIA FLEXIBLE AND REVERSIBLE DISC HARROW.

The only absolutely flexible and reversible disc harrow. *Others are reversible, but not one is flexible;* it is the only harrow on which the weight is so evenly distributed that an equal pressure is upon all the discs, regardless of the positions of the gangs, whether they are straight when cutting on a level or tilted to conform to uneven ground; the discs invariably cut to an even depth at all times. *It will cut up*

and pulverize corn stubble land, doing more and better work than a half dozen plows; hard plowed ground is rapidly and thoroughly cut and pulverized ready for seeding or further disintegration with drag harrows. *The draft is always from the center,* whether the harrow is working as an in-throw or an out-throw. When working on irregular ground, any tendency of the ends of the gangs to rise is counteracted by the rocking arms equalizing the pressure, so that no matter what may be the power of the end thrust it only tends to increase the flexibility of the harrow, giving an even depth of cultivation under each gang; the soil is cut the full width of the harrow, and no uncut ground is left between the gangs.

The frame is exceedingly staunch and durable, the heavy flat steel bars and castings of which it is constructed being designed especially to stand the heaviest work in the most stubborn soil; it is also very open, giving full clearance for any trash or stalks that may be thrown up by the revolution of the discs.



The Gangs Perfectly Flexible.

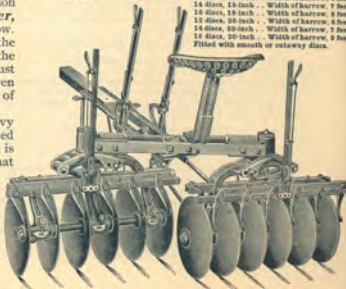
MADE IN FOLLOWING SIZES:

12 discs, 16-inch . . .	Width of harrow, 6 feet	16 discs, 16-inch . . .	Width of harrow, 8 feet
14 discs, 16-inch . . .	Width of harrow, 7 feet	18 discs, 16-inch . . .	Width of harrow, 9 feet
		20 discs, 16-inch . . .	Width of harrow, 10 feet
		22 discs, 16-inch . . .	Width of harrow, 11 feet
		24 discs, 16-inch . . .	Width of harrow, 12 feet
		26 discs, 16-inch . . .	Width of harrow, 13 feet
		28 discs, 16-inch . . .	Width of harrow, 14 feet
		30 discs, 16-inch . . .	Width of harrow, 15 feet
		32 discs, 16-inch . . .	Width of harrow, 16 feet
		34 discs, 16-inch . . .	Width of harrow, 17 feet
		36 discs, 16-inch . . .	Width of harrow, 18 feet
		38 discs, 16-inch . . .	Width of harrow, 19 feet
		40 discs, 16-inch . . .	Width of harrow, 20 feet

Fitted with smooth or cutaway discs.



The Frame is Strong.



See Oil Hole
and how
protected
from dirt.



THE BOXES, BEARINGS, AND LARGE FLANGED SPOOLS are **HARD CHILLED METAL**, and with the steel shafts, form a combination indicative of great strength and vitality.

The scrapers are the reliable and effective style well known on the Osborne Harrows. They are thrown into and out of engagement with the discs by levers within easy reach of the driver, and are locked in either position. They are the best scrapers ever designed; they are sure and positive in operation, and will not get out of order.

The control of each gang is independent of the other, each having a long, easy working lever, that

THE BOXES AND BEARINGS ARE CHILLED, giving hard wearing surfaces.

can be quickly moved to set them at any angle desired, whether the harrow is at work or standing still. **All the journals are dirt proof and easy to oil.** **This Harrow is alone in its thorough flexibility**, no other harrow can be classed with it. It is the best ever produced; its efficiency and durability are unequalled. The discs used on all of our harrows are made of the finest quality of steel obtainable for this purpose.

OUR COLUMBIA RIGID REVERSIBLE DISC HARROW.

For Vineyards and Orchards.

Is made in four or five-foot sizes, as a rigid and reversible harrow. These sizes are particularly adapted for vineyard and orchard work. It throws the soil out from the vines. By the simple adjustment of a link connection it is possible to set the inner ends of the gangs so that they will cut deeper than the outer ends, thus insuring safety to the roots of vines or trees, while the ground between the rows is worked as deeply as desired.



High Frame will not catch stalks or trash.

These
Scrapers
Are
Reliable.





VALUABLE INFORMATION.

POULTICES.

Poultices—These are generally made of substances that will take up and hold large quantities of water, and retain a soft condition. Their power to cure depends upon the heat retained by the poultice and the liquids with which they are mixed. Milk will not evaporate as quickly as water. Glycerine added to a poultice will aid in keeping it soft. A layer of mosquito netting between the poultice and the skin will keep the mass together so that there will be no trouble in changing the poultices when fresh ones are needed. Poultices should be kept warm and moist by covering the outside with oil-silk, a sheet of gutta-percha or india rubber cloth. A square cut from some old gossamer will be the best that can usually be obtained.

Slippery Elm Poultice—This poultice will remove inflammation sooner than any other. It is used to allay pain and hasten suppuration. It is extremely valuable in boils and ulcers.

1 pound of Slippery Elm Bark.
½ ounce of Tincture of Myrrh.

Stir in hot or warm milk or water, enough of the Slippery Elm bark to make a poultice of the required size, stir thoroughly and add its proportion of the tincture. Apply warm and keep it moist by covering.

Flaxseed Poultice—This poultice is of much value because it will not crack when it becomes dry.

2 ounces of Powdered Flaxseed.
1 gill Hot Milk or Water.

Prepare by slowly sprinkling the flaxseed into the liquid, all the time thoroughly stirring with the spoon.

Soap Poultice—This is an old-fashioned remedy having much virtue. It is of greatest value in scalds and burns.

2 ounces of Scrap White Soap.
½ pint of Boiling Water

Dissolve the soap thoroughly in the water and use the liquid for mixing with sufficient bread or flaxseed to make a poultice.

HOW TO PRODUCE SWEATING.

Perspiration—Colds may be "broken up" by a good "sweat" that would otherwise terminate in a long run of fever. Common remedies are usually at hand, and it is only necessary to know how to use them. Take a sweat as soon as the cold is noticed.

Boneset Tea—A valuable remedy that can be always at hand. Gather the boneset while in blossom or procure at the drug store.

2 ounces Boneset
1 quart Boiling Water.

Boil for half hour. Take four tablespoonfuls as hot as possible every thirty minutes. This will produce a profuse perspiration.

Sweating Tea—This will produce sweating in many of the most obstinate cases.

2 ounces Fleurisy Root.
3 pints Water.

Simmer for half hour. Take a teaspoonful as often as the stomach will bear it.

Sweating Drops—Take a teaspoonful of pepper sauce upon sugar before going to bed. Cover up warm and a good sweat will be the result.

EMETICS.

Common Emetic—An emetic that can be obtained at a moment's notice is sometimes essential. This may be obtained at almost any home and is a reliable emetic:

2 teaspoonfuls of Common Salt.
2 teaspoonfuls Mustard.
1 glass of Warm Water.

Drink all the stomach will take.

Emetic Syrup—This is a valuable emetic and a family having children should never be without a bottle of this syrup.

1 ounce of Simple Syrup.
1 ounce Wine of Ipecacuanha.
2 ounces of Water.

Mix and take from one-half to one ounce every quarter hour till vomiting takes place. For a child give twenty drops or more according to age.

WORM REMEDIES.

Symptoms—The symptoms denoting worms are quite common to the various species. The surest is to find them in the passages of the bowels. The other symptoms are: starting during sleep; grinding of teeth; itching of nose and indigestion with a variable appetite.



VALUABLE INFORMATION.

Stomach Worms—To expel these from young children use the following faithfully and success will follow:

16 grains Santonine, 2 ounces Fluid Extract Pink-Root.

Mix and give child two years old one teaspoonful night and morning until it physic.

Pin Worm Remedy—The thread or seat worm may be washed away by an injection of quassia which has been soaked for twenty-four hours in water enough to cover. This should be followed by doses of stomach worm remedy. It is well to take a tonic after the expulsion of the worms.

COUGH REMEDIES.

Cough Mixture—A large number of cough remedies contain some form of opium, as landanum or paregoric, which while having the desired effect upon a cough, have a tendency to constipate the bowels, which has to be overcome by a cathartic. The following is a valuable remedy which does not constipate.

4 ounces Iceland Moss.	4 tablespoonfuls Pearl Barley.
2 ounces Tincture of Lobelia.	4 ounces Poppy Capsules.
$\frac{3}{4}$ pint Molasses.	4 quarts of Water.

$\frac{3}{4}$ pound of Sugar Candy.

Mix all together excepting the candy, and boil down to three quarts, then dissolve in it the candy. Dose, one tablespoonful when the cough is troublesome.

Blood Root Syrup—This is one of the standard remedies and is of great value in bronchial troubles, coughs and difficult breathing.

5 ounces Bruised Blood Root.
3 ounces Sugar, 3 pints of Water.

Simmer gently till it thickens, then add one tablespoonful of paregoric. Dose is one tablespoonful occasionally; for a child, one teaspoonful or less, according to age.

To Cure a Cold—Often a cold is accompanied with an annoying cough. The following remedy is very soothing and healing.

3 pounds Pine Needles. $\frac{1}{2}$ pound Loaf Sugar.

Steep the needles in water and boil down. Add the loaf sugar and boil till it thickens. Drink of it while warm during the day and before going to bed.

MEDICATED SYRUP.

Rhubarb Syrup—Rhubarb is well known as a gentle physic, but it is bitter and unpleasant to the taste. Prepared as a medicated syrup it loses its unpleasant taste.

3 ounces Fluid Extract Rhubarb, 1 pint Simple Syrup.
Mix and shake the bottle a few times during the day. Then filter next day and it is ready for use.

TO PREVENT CONTAGION AND BLOOD POISONING.

Disinfectants are agents which have the power of destroying or neutralizing infectious matter, which is the product arising from those suffering from a contagious disease, as small-pox, measles, scarlet fever and a variety of other sources, as sewers, cesspools, decaying matter, etc. Disinfectants are used in solid forms or in solution to destroy the infectious germs contained in the clothing and cesspools, and often found in the apartments of the sick.

Fumigation is disinfection by means of a gas instead of by the use of solids or solutions. This is very valuable in disinfecting air and articles which would be destroyed by wetting.

A Few Disinfectants—In the sick room fresh air and cleanliness are always at hand. Besides these you have:

Brimstone—(Rolled Sulphur) for fumigation.

Copperas—(Sulphate of Iron) $1\frac{1}{2}$ pounds to a gallon of water is used in cess-pools and sewers.

Common Salt and Sulphate of Zinc—(White Vitriol) 4 ounces of each to a gallon of water, to disinfect clothing and bed linen.

Corrosive Sublimate—(Bichloride of Mercury) 16 grains to a quart of water, is used to receive discharges from body, when the patient has cholera, typhoid fever, etc. The quantity used should equal the amount of discharge. This is very poisonous, and must be used with greatest caution.

Chloride of Lime—This is a very valuable disinfectant, but it will discolor clothing that has coloring matter in them, when the will be attacked by the free chlorine given out from the compound. Clothing is best disinfected by common salt and sulphate of zinc. Use chloride of lime, one pound to three gallons of water, to sprinkle on floors and wash out sinks that are offensive. Dry chloride placed in rat holes, from which come offensive odors, will soon purify the atmosphere. It should be used in urinals, night commodes, water closets, privy vaults, butcher stalls, slaughter houses, fish markets, pig pens and stables, especially if the latter are near the house. Use it freely whenever a contagious disease or an epidemic of any nature is in the neighborhood.



18

THE OSBORNE RIVAL DISC HARROW.



ADJUSTABLE
SADDLE FOR
REGULATING
THE GANGS.

A FRAME
THAT WILL
NOT WARP
OR TWIST.

The one piece, solid bar, steel main frame is a guarantee of strength to resist any hard usage the harrow may be subjected to. There can be no neck weight or side draft for the balance is accurate, and the frame is secured to the disc gangs in such a manner that the draft is direct and central.

The height of the gang frames prevents clogging, and the high grade of steel and iron used in their construction precludes the possibility of bend or break.

The gangs can be quickly moved to any desired angle by the levers located within easy reach of the driver.

The scrapers have an even play against the discs through their spring pressure, and may be locked in or out of engagement.

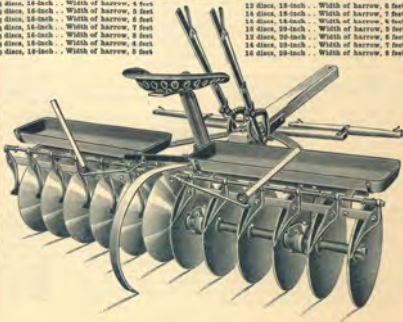
This celebrated harrow, while not the equal of the Columbia, stands first in the class of rigid harrows.

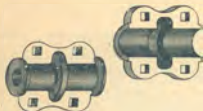
The same quality of discs is used on all our harrows, the best that can be made.

MADE IN FOLLOWING SIZES:

8 discs, 16-inch . . .	Width of harrow, 4 feet
10 discs, 16-inch . . .	Width of harrow, 5 feet
12 discs, 16-inch . . .	Width of harrow, 6 feet
14 discs, 16-inch . . .	Width of harrow, 7 feet
16 discs, 16-inch . . .	Width of harrow, 8 feet
8 discs, 18-inch . . .	Width of harrow, 4 feet
10 discs, 18-inch . . .	Width of harrow, 5 feet

12 discs, 18-inch . . .	Width of harrow, 6 feet
14 discs, 18-inch . . .	Width of harrow, 7 feet
16 discs, 18-inch . . .	Width of harrow, 8 feet
12 discs, 20-inch . . .	Width of harrow, 6 feet
14 discs, 20-inch . . .	Width of harrow, 7 feet
16 discs, 20-inch . . .	Width of harrow, 8 feet





Mechanically Constructed Chilled Bearing; does not wear out.

CHILLED BEARINGS, steel shafts and broad flanged spools guarantee a durability unequalled by any similar harrow. The Rival is in use all over the

world, and its reputation for efficiency and great strength grows with every season.

The center ridge always left by harrows of this class, is completely cut out by the spring-tooth attachment, so that no ground is left hard and uncultivated, the soil is fully pulverized the full width of the implement. The center tooth can be regulated by a lever to cut deep or shallow, or it may be raised out of engagement with the ground altogether.



Showing Three-Horse Attachment.



The scrapers have an even play against the discs through their spring pressure, and may be locked in or out of engagement.



Spring-Tooth Attachment; no Center Ridge Left.





VALUABLE INFORMATION.

How to Use Disinfectants—All clothing, towels and bed linen, before removing from the room, should be placed in a tub of boiling salt and zinc solution. All discharges should be received in vessels which contain either the corrosive-sublimite or the copperas solution.

Prevention of Diphtheria—Every person in contact with a person afflicted with diphtheria, should use disinfectant gargles as a preventive. A physician should prepare the gargle and give directions for its use.

Prevention of Typhoid Fever—This disease is largely transmitted through the passages from the bowels. Some one of the disinfectants should be used in the commode, allowing the stool to pass directly into the liquid prepared as suggested. Corrosive-sublimite (bichloride of mercury) is the most efficient. Sulphate of zinc (white vitriol), is also very valuable. If proper care be taken in this regard there is very little danger of typhoid fever being transmitted to another person.

Scarlet Fever and Measles—These diseases, while disinfection does not prevent their being contagious, seem to be modified by the proper use of disinfectants. Often those attacked by the disease, where disinfectants have been properly used, have it in a much modified form.

Typhus Fever and Small Pox—Do not for a moment neglect the use of disinfectants, and use them freely. Do not burn rags nor clothing that have been on the patient, but drop them in some strong disinfectant fluid.

How to Fumigate—Every opening, such as doors, windows, ventilators and chimneys should be tightly closed. All blankets, bedding and other articles which cannot be treated to the zinc solution should be hung on lines in the room. All colored articles should be thoroughly dry, because if moist the fumes will destroy some of the colors. Mattresses and upholstered furniture should be taken apart. The hair or other filling should be treated to the zinc solution, while the other parts should be exposed.

Take a wash tub or barrel and place in it bricks on which to set an iron kettle. Pour water in the tub or barrel until it nearly covers the bricks. Place in the iron kettle, which sets on the bricks, roll sulphur and set it on fire by means of hot coals, or with the aid of a little alcohol poured over it and then ignited. About three pounds of sulphur should be used to every 1,000 cubic feet. Keep the room closed at least twenty-four hours, after which thoroughly air.

Cesspool Disinfectant—To every 500 pounds of the estimated contents use one pound of corrosive-sublimite in solution.

Sprinkle chloride of lime daily over the contents during epidemics and at least every two weeks at other times.

To Disinfect Sinks and Drains—These often become very offensive and are always a source of danger, breeding diphtheria and malarial fevers, unless properly disinfected. Copperas dissolved in water, one-fourth of a pound to a gallon, and poured into a sink and water drain occasionally will keep them pure and wholesome. One-half pound of chloride of lime to a gallon of water will have the same effect.

When large quantities are used to disinfect vaults or stables, a home-made preparation, as follows, will be very efficient: Dissolve one bushel of salt in a barrel of water, and with this salt water slack a barrel of lime. This should make the lime wet enough to form a thin paste. If not, add more water.

To Disinfect the Cellar—A damp, musty floor may be sweetened by sprinkling upon the floor pulverized copperas or chloride of lime. Cellars that have contained potatoes, carrots, turnips, cabbage or other vegetables during the winter should be thoroughly disinfected early every spring by sprinkling the floors, walls and bins that held the vegetables with water that contains one-half pound of chloride of lime to the gallon.

Deodorizers are agents which destroy or neutralize the offensive odors arising from decaying matter or in the sick room. They may or may not have the power of destroying contagious matter, their use being to mask unpleasant odors. Those that have disinfectant properties as well as deodorizing, are carbolic acid, chloride of lime and chloride of zinc. The simple deodorizers are burning cotton, paper or coffee. A portion of chloride of lime placed on a plate on the mantel is a very constant deodorizer.

How to Use Deodorizers—Chloride of zinc, an ounce to a quart of water, sprayed about the room occasionally is an effectual means of destroying offensive odors.

Chloride of Lime used as above suggested.

Use the disinfectants as suggested for the discharges from body. Burn paper, cotton or coffee and let the smoke pass in the room.

Chlorine—This is a very powerful disinfectant. It is a green gas and attacks chemically nearly all contagious matter. It is used in the form of gas which is generated and allowed to pass into the rooms. If this is generated in cellars where vegetables and other articles mold it will destroy the fungus. It is very penetrating and has bleaching properties. Articles that would be injured by this gas should be removed and disinfected by other means.

Fragrant Odor—A pleasant odor may be imparted to the sick chamber by a small quantity of the oil of sandal wood upon a hot shovel or on the top of a hot stove.



VALUABLE INFORMATION.

ACCIDENTS AND EMERGENCIES.

What to do—If an artery is cut, red blood spurts. Bandage it above the wound. If a vein is cut, dark blood flows. Bandage it above and below the wound.

If choked, get upon all fours and cough. A sharp blow between the shoulders may help in expelling whatever is in the throat or oesophagus.

For slight burns, dip the part into cold water. If the skin is destroyed cover with linseed oil. Common baking soda is a good remedy for burns.

Send for a physician in case of a serious accident, but do what is here directed until he comes.

Clothing Catching Fire—If you see a person whose clothing is on fire, throw him to the ground and roll him over and over. Throw a coat, rug, carpet, or any blanket at hand over him. The object of this is to prevent the flames being swallowed.

Scalds and Burns—These are common accidents, and an understanding of what to do may save a life and much suffering.

The first, best and often the only remedies necessary are sheets of fine wadding or cotton and flour or chalk. The object is to exclude the air, because if the air is excluded and care is taken not to expose the tender part till a new skin is formed, nature generally effects a cure. In case of a scald or burn, cover immediately the part with a sheet of wadding or cotton, taking care not to break any blister that may have formed, or even waiting to cut away burnt clothing that may adhere to the surface. Cover immediately to keep out the air. A coating of oil over the cotton is a great help in keeping out the air. A light bandage to firmly hold the cotton in place should then be used. When there is no cotton at hand, cover the wound with flour.

If the skin is badly injured and the cotton cannot be readily obtained, cover some linen with fresh butter or lard and lay the same over the part and give the patient, if much exhausted, a little brandy. If not much injured, yet very painful, dip cotton in lime and linseed oil and apply. If nothing else is handy, scraped raw potato may be used, or put on common molasses and dust the surface over with flour.

Cuts and Wounds—Clean-cut wounds, whether deep or only superficial, which are likely to easily heal, should be washed with an antiseptic lotion, and then evenly and smoothly closed by bringing both edges together and securing them in that position by

adhesive plaster. Cut the adhesive plaster into thin strips and fasten on one side of the cut, then bringing the parts of the wound together, edge to edge, fasten the loose end. Ordinary cuts are easily dressed in this way, but if the cut be large and the edges difficult to hold together, some assistance from a second person may be necessary.

Bruises or "Black and Blue Spots"—Put on hot water cloths, or if there is much pain, a hot poultice, renewing the same every two hours.

Dirt in the Eye—Dirt in the eye generally adheres to the upper or lower lid. As the lower lid is the more easily examined it is well to see if the dirt is adhering to this part. This is done by standing in front of the person, and pressing the finger upon the flesh on the cheek bone and drawing down the skin. Then if the dirt is in sight, it can be removed by the moist corner of a handkerchief. If the dirt is not on the lower lid, place a match or a knitting needle over the upper lid and by pressing downward, and at the same time raising the upper lid, it will be turned inside out. This will expose to view the offending particle which may be removed as before. The eye should then be bathed in cold water and the light excluded. If the inflammation is severe, put on cold tea leaves or scraped potato, or bathe in salt and water.

Fainting and Fits—Fainting is caused by a lack of blood to the brain which has been caused by the stoppage of the heart or the blood going to some other part of the body. Place the person who has fainted on the back with head low; loosen the clothing about the neck and chest; sprinkle cold water in the face and apply smelling salts to the nostrils. Do not raise the head higher than the body, unless the face is red or dark colored, which is an indication that it is not an ordinary fainting fit and should be treated differently. In cases of this kind raise the person on a seat and put cold water on the head immediately.

TO KILL CRICKETS.

A little ginger and water placed in a dish before the fire will attract crickets, and on partaking of the liquor they will die. The best mode of destroying the insects in their nests is to put snuff into the chinks of the grate.



THE OSBORNE RIDING SPRING-TOOTH HARROW.

Made with 15, 17,
21, 23 teeth.



Front View of Harrow—Levers within easy reach.

mounted on the tooth beams, the spring teeth would be held rigidly to the ground by the weight of both wheels and driver, all flexibility would be destroyed, and contact with an obstruction would result in injury to the harrow.

THE OSBORNE RIDING HARROW is *extremely flexible* and readily accommodates itself to the surface of the ground, the center of the implement rising to cultivate a ridge, or dropping to reach the soil in a hollow. This cannot be done by any other riding harrow in existence.

The location of the sulky near the center of weight of the harrow, guarantees an accurate balance, consequently a light and easy draft. Nearly the entire weight of the implement is carried by the sulky, enough bearing on the front shoes to prevent any sidewise motion.

Upon its introduction to the public it at once jumped to the front as the most popular implement of its kind among a dozen others, for profiting by our long experience in the construction of spring-tooth harrows, and knowing what is required of them in actual work, we have added a riding attachment that is as novel as it is a thoroughly useful and valuable improvement.

This harrow is made in only one grade, and that is the best; every part of it is selected steel and iron, put together with consummate skill, and resulting in an implement that has neither rival nor superior.

The sulky, or riding attachment, carries the full weight of the driver so that the sections of the harrow can rise to free the teeth from stones or roots without injury. If the riding wheels were held rigidly to the ground by the weight of both wheels and driver, all flexibility would be destroyed, and contact with an obstruction would result in injury to the harrow.



The Sulky is Independent of the Tooth Bars and Frame.



To Show Secure Fastening
of Tooth-Bar.

and holding them to the sulky by a movable and adjustable attachment, gives the fullest amount of flexibility required to suit uneven ground.

The tubular bars with the spanner attachment of the teeth are familiar to all users of our harrows. The spring teeth are of high carbon steel, and our manner of securing them to the bars gives the maximum amount of spring without strain on the bolt; the frame is carried high above the ground to avoid the accumulation of trash, and is made of steel angle bar.

The set levers regulate the depth of cultivation and are easy to operate.

The riding attachment has broad, concave faced, steel wheels, twenty inches in diameter and fitted with sand proof bearings; their tracks are

covered by the rear teeth. The amount of weight carried by the front shoes is regulated by raising or lowering the clevises. ***Experience has taught us that shoes are preferable to swivel wheels*** on the front of the frames, their use prevents the harrow from running forward on the horses during transportation on a down grade, and from all lateral movement when at work.

No farmer who advocates thorough cultivation, and consequently a total destruction of weeds, can afford to do without this remarkable implement. It is the only riding spring-tooth harrow that is flexible, light in draft, perfect in all adjustments, and thoroughly efficient.



The Harrow is Flexible.





VALUABLE INFORMATION.

TO REMOVE STAINS AND GREASE SPOTS.

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Ink Stains—There are two kinds of ink stains, aniline and gallnut. Many inks made now are aniline, so it is always best to treat all ink stains first with diluted tartaric acid, increasing its strength until the spot begins to disappear. Should this acid, however, have no effect, then treat for ink made from nutgalls. The cloth containing the spot is spread out tightly over a bright, hot tin plate and rubbed with a hot solution of oxalic acid, using a piece of iron to rub with, such as an iron key. It often happens that in silk goods nothing can be done to remove the stain.

Ink Stains on Table Linen—The best way to take ink out of table linen is to soak the spots in sour milk. Put the cloth in the fresh milk and set it where it will turn sour. The process of souring seems to assist in drawing out the stains. Rub the spots after they have been soaking twenty-four hours in the milk, (provided it has curdled in that time), just as you would wash any spot in water. They will finally become very faint and may now be washed out in water, and the first time they are put through the weekly washing the probability is that all traces of the ink stains will have disappeared.

Grass Stains—These are very readily removed by moistening with Sodium Chloride and rinsing well in water.

Fruit Stains—Fruit stains in white goods must be bleached out with Javelle water (see directions how to make), and well rinsed in clear water. Do not try soap, except as a last resort, as it sometimes has the effect of setting the color and rendering the stain difficult to remove. For colored silks use warm water, castile soap suds and ammonia. This applies in general to all vegetable stains, including red wine, and to red ink stains.

An old-fashioned way of removing fruit stains is to pour boiling water upon them. This is best done by spreading the section of cloth containing the spot out firmly over a bowl or pan and pouring boiling water upon it from the spout of a teakettle.

Fruit stains are easily removed from table linen by wetting spots with spirits of camphor before being washed. If camphor is not at hand, whisky will answer.

Acid Stains—Excepting those from citric acid, which are permanent, acid stains can be neutralized by the action of an alkali, strong ammonia usually being the most effective. If the stain is fresh and of a red color it will sometimes disappear by moistening it with water and holding over the mouth of a bottle of ammonia

so that the fumes may come in contact with it. In general, however, the acid stain should be neutralized by the direct application, drop by drop, of strong ammonia, meanwhile watching carefully the colors of the fabric so that they may not be injured.

Coffee Stains—Coffee stains may usually be removed by moistening the spots and holding them over the fumes of a small piece of sulphur placed in an iron vessel. Sulphur being an acid, the stained parts must at once be carefully washed with water containing a little soda or ammonia to save the fibre from injury. If a spot is quite small, it may be moistened and held over the fumes of a few sulphur matches. The vapor from burning sulphur will often remove stains that nothing else will affect, but the fabric must be immediately and thoroughly rinsed in every instance.

To Remove Paint—Paint and varnish may be removed by using turpentine, gasoline or benzine. On silk, ether gives the best results. Old spots on woollen goods should be covered with olive oil and allowed to remain for several hours; then treat with chloroform. This applies also to resinous stains.

Kalsomine Stains—Kalsomine yields at once to water and acetic acid, though like all stains, even these simple blemishes may be fixed in cloth, if unduly experimented with.

Iron Rust—This is removed by holding the spot over a bowl of water to which a little ammonia has been added, and applying with a glass rod or small piece of wood, eighteen per cent. muriatic acid. The instant the stain disappears, immerse the spot in water, thereby preventing the acid from affecting the texture of the cloth. Before using muriatic acid, it is best to test it on one corner of the fabric. Should you find that it changes the color, then treat as for ink stains described above.

Mildew—Generally speaking, mildew is not affected by chemicals, though it sometimes yields to their action. It may best be treated with a stiff paste made by boiling down castile soap shavings, spreading a thick layer of this upon the stain and scattering over it some powdered potash. Moisten slightly with water and bleach out on the grass.

Candle Grease—Paraffine or tallow is best removed with chloroform, though every housekeeper knows the old trick of ironing over a piece of blotting paper.



THE OSBORNE COMBINATION HARROW.

Two implements combined in one. A spring-tooth harrow to open and pulverize the soil and destroy weeds, and a smoothing harrow to level and smooth the ground and cover the seed. **No other harrow possesses these advantages, for there is no other. This is the only combination harrow** in existence. The frames are high, and strong, and are independent of each other.

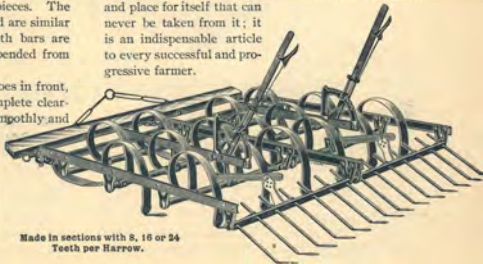
The channel steel side bars are connected at their front and rear ends by angle steel end pieces. The teeth and the bars to which they are bolted are similar to those on our other harrows; the tooth bars are journaled in malleable iron brackets suspended from sides of the main frames.

Carrying the frames high on sloping shoes in front, and slanting teeth in the rear, gives a complete clearance for all trash, and the harrow rides smoothly and easily over the ground. **The action of the slanting teeth is to comb the soil, as it were, making it fine and mellow;** they also act as a rudder to the harrow, keeping in a straight course, and destroying side motion.

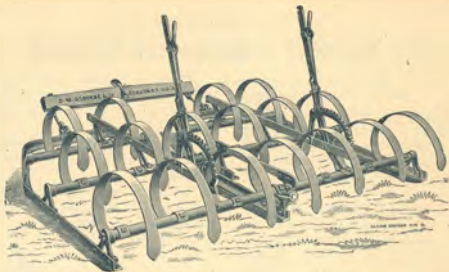
Changing the draft by hitching high or low in the series of holes in the draft iron on the front of the frame will give more or less weight on the slanting teeth.

The levers, within easy reach of the operator, adjust the spring teeth to drag deep or shallow as desired.

The teeth cannot trail each other, as they are set alternately. This implement has made a reputation and place for itself that can never be taken from it; it is an indispensable article to every successful and progressive farmer.



Made in sections with 8, 16 or 24
Teeth per Harrow.



Made with 9, 15, 17, 23 Teeth.

THE OSBORNE COLUMBIA SPRING-TOOTH HARROW.

A spring-tooth harrow with every quality necessary to perfection, constructed to thoroughly pulverize any kind of soil, to guarantee a perfect seed bed, and to destroy all weeds in their early growth.

The steel angle bar frames are made of one piece, sloping upward at the front to allow the harrow to slide over ordinary obstructions and trash.

One of the most novel and valuable features of this harrow is the rear cutaway frame

of one of the sections. This is a perfect preventive of the accumulation of trash between the frames, a fault very common with the ordinary spring-tooth harrow. This improvement is original with us; it is found only on the Osborne Harrows, and is protected by our patents.

Malleable iron boxes, secured to the sides of the frames, support the tubular steel tooth bars which will not bend or break under any strain of cultivation.



OUR SPRING TEETH ARE MADE OF SELECTED HIGH CARBON STEEL, tempered to give perfect spring action without danger of set. They are secured to the tooth bars by a single bolt, a very simple, positive and reliable fastening; the ends of the teeth grasp *about two-thirds the circumference of the tooth bars*, giving the greatest resistance to any possible strain upon the teeth or bolts; this is a most durable construction.

The amount of work capable of being done by this harrow, and its life, is double that of any other.



OSBORNE TOOTH FASTENING. No strain on the bolt. A tooth constructed on mechanical principles, so that the strain is equally distributed on all parts and stands the wear when others break.



Another Tooth Fastening—all the strain on the bolt.

The draw bar is attached to the center front of each frame, giving a steady and direct draft to the harrow and eliminating all side motion.

The teeth do not trail each other, and no ground is slighted within the limits of the harrow, all is thoroughly crumbled and pulverized.

A successful implement advertises itself, and the world-wide reputation of this harrow is sufficient evidence of its success and popularity; it is the greatest and best of spring-tooth harrows.



VALUABLE INFORMATION.

HARNESS AND LEATHER.

To Preserve Harness—First remove the dirt with a moist sponge. Do not use too much water, nor any soap. No harness gets so muddy that a moist sponge will not remove the dirt, if cleaned while the mud is moist. Now give the leather a good coat of lampblack and castor or neat's-foot oil. Then with a good warm soap-suds sponge the harness thoroughly, removing all the dirt. When the harness becomes dry, rub it over with a mixture of oil and tallow, equal parts, with which has been mixed lampblack or Prussian blue to give it color. Do not use more of this last compound of oil and tallow than is actually necessary and rub it in thoroughly.

Leather Blacking—Take one ounce of coppers and one and one-half pints of water, and thoroughly mix. This is used by harness makers and shoemakers for blacking the edges of newly cut leather, or staining places that have become red or "foxy."

Old Harness Made Like New—Harness after long exposure to the air loses its lustre and turns brown, and requires a new coat of blacking. This will not enter the grain, while there is any grease on the surface, and it must be removed by careful washing in potash water. After drying apply a coating of the LEATHER BLACKING. Then apply a coating of oil to the surface to fasten the color and make the harness pliable.

CLEANING AND POLISHING.

To Clean Copper or Brass—The next time you think you have done with a lemon, just dip it in salt and rub your copper kettle with it. You will be surprised to find what a brilliant surface you will obtain if you rub the article instantly with a dry soft cloth. You can polish all brass work by the same means, every stain disappearing as if by magic. If the brass is on furniture in the shape of knobs or ornaments, use either powdered whiting or scrape rotten stone, mix with sweet oil and rub on with chamois skin.

Silver—Keeping Bright and Clean—To clean silver never use a particle of soap on your silverware, as it dulls the lustre, giving the article more the appearance of pewter than silver. When it wants cleaning rub it with a piece of soft leather and the following mixture.

$\frac{1}{2}$ pound Prepared Chalk or Whiting. $\frac{1}{4}$ ounce Gum Camphor.
1 ounce each of Aqua Ammonia and Alcohol. 3 ounces of Benzine.

Mix well together and apply with a soft sponge and allow it to dry before polishing.

To Keep Bright—For the preservation of the lustre of articles of silver or plated ware, when not needed for actual use for a considerable time, a coating of collodion (to be had at the drug stores), may be employed to great advantage. The articles are to be heated and the collodion then carefully applied by means of a brush, so as to cover the surface thoroughly and uniformly. It is used most conveniently when diluted with alcohol, as for photographic purposes. Articles thus prepared exhibit no trace whatever of their covering, and have stood for more than a year in shop windows and in dwellings, retaining their white lustre and color, while other pieces not thus prepared became seriously tarnished.

To Clean Silver—One of the largest britannia firms in New England recommends the following to clean silver:

$\frac{1}{2}$ pound Sal soda,
8 quarts of Water.

When at a boiling heat dip the pieces of silver and immediately wash in soap suds. Wipe dry with a piece of cotton flannel.

To Keep the Stove Bright—Mix the stove blacking with vinegar to the consistency of cream, add pinch of sugar, put on with a brush and polish with old newspapers. It will give a beautiful and lasting polish.

To Clean Willow Ware—To clean willow furniture, which is not varnished, use salt and water. Apply it with a stiff brush, scrub well and dry thoroughly.

To Clean Glass—First wash well with a soft sponge, using clear water and squeezing the sponge as dry as possible. Then dip the damp sponge in whiting and rub over the surface of the glass. When dry rub clean with a soft cloth.

ANNOYING INSECTS.

To Exterminate Bed Bugs—There are various remedies for getting rid of these annoying insects. The following are the most reliable:

1. Put a few drops of oil of cinnamon into naphtha and anoint the openings and cracks. Do not take near fire or burning lamp.
2. Two ounces red arsenic, one-quarter pound of white soap, one-half ounce of camphor, dissolved in a teaspoonful of alcohol, made into a paste of the consistency of cream. Use to anoint the bedstead.



VALUABLE INFORMATION.

To Destroy the Striped Bug—The striped bug on cucumbers and melons may be destroyed as follows:

1. By a strong solution of hen-house manure—say one peck of the manure to one and one-half gallons of water. Let it stand twenty-four hours and sprinkle the plants freely with it after sunset.

2. By sifting charcoal dust over the plants, if repeated three or four times, the plants will be entirely freed from the annoyance.

3. Plant a few kernels of buckwheat in each hill of cucumbers or melons and striped bugs will not trouble the vines.

Roach Exterminator—Borax is one of the best roach exterminators. There is something either in the odor or touch of borax which is certain death to them. Purchase it pulverized and sprinkle around the infested places.

Red Ants—Sprinkle oil of pennyroyal on the pantry shelves and the ants will disappear.

Flies on Horses—As a preventive of horses being teased by flies, take two or three small handfuls of walnut leaves, upon which pour two or three quarts of cold water; let it infuse for one night and pour the whole next morning into a kettle and let it boil for fifteen minutes. When it becomes cold it will be fit for use. No more is required than to moisten a sponge and, before the horse goes out of the stable, let those parts which are most irritable be smeared over with the liquor—namely, between and upon the ears, the neck, the flanks, etc. Not only the lady or gentleman who rides out for pleasure will derive pleasure from the walnut leaves thus prepared, but the coachman, the wagoner, and all others who use horses during the summer.

TO KEEP OUT MOSQUITOS.

1. Oil of pennyroyal scattered about in small quantities. This is best sprayed about the room with a perfume atomizer.

2. Take of gum camphor a piece about one-third the size of an egg and evaporate it by placing it in a tin vessel and holding it over a lamp or candle, taking care that it does not ignite. The fumes will soon fill the room and expel the mosquitoes.

3. Carbolic acid has recently been successfully used for extermination of mosquitoes and flies. A small piece of cloth saturated with the acid was hung in the room, and in two hours the flies had entirely disappeared. In the evening the acid was tried in the kitchen where the mosquitoes were very troublesome, and there it met with the same success.

MOTHS IN CLOTHING AND FURS.

Either one of the following methods will keep out the moths, provided the clothes are put away without any eggs being upon them. Put in boxes and paste paper all around the cover, making it impossible for them to get in.

1. Sprinkle allspice berries among the clothes.

2. Sprinkle the clothes with the seeds of the musk plant.

3. Procure shavings of camphor wood and enclose in bags.

4. Procure shavings of cedar wood and enclose in muslin bags, which should be distributed among the clothes.

5. An ounce of gum camphor and one of the powdered shell of red pepper are macerated in eight ounces of strong alcohol for several days, then strain. With this tincture the furs or clothes are sprinkled over and rolled up in sheets.

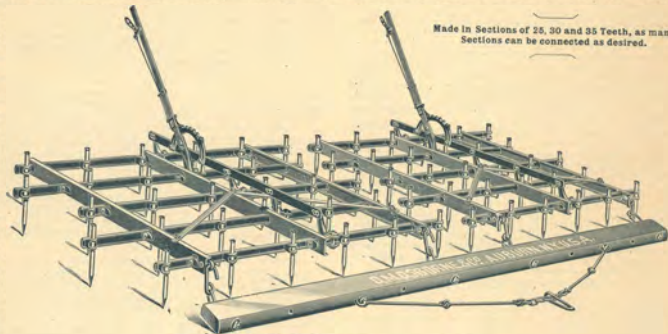
6. Carefully shake and brush woollens in the spring so as to be certain that no eggs are in them. Then sew them up in cotton or linen wrapper, putting a piece of camphor gum tied up in a bit of muslin into each bundle, or into the chests and closets where the articles are to lie. No moth will approach while the smell of camphor continues. When the gum is evaporated it must be renewed. Enclose then in a moth-proof box with camphor. Furs or woollens put away in spring time, before moth eggs are laid, into boxes, trunks or closets even, where moths cannot enter, will be safe from the ravages of moth worms, provided none were in them that were laid late in the autumn, for they are not of spontaneous production.

TO DESTROY COCKROACHES.

1. Strew the roots of black hellebore at night in the places infested by these vermin, and they will be found in the morning dead or dying. Black hellebore grows in marshy ground where it may easily be gathered, or it may be purchased at any drug store.

2. Take pulverized borax, four ounces; flour, one ounce; mix intimately and distribute the mixture in cupboards which are frequented by the roaches or blow it by means of a bellows into the holes or cracks that are infested by them.

3. Take carbolic acid and powdered camphor in equal parts; put them in a bottle; they will become fluid. With a painter's brush of the size called a sash-tool, put the mixture on the cracks or places where the roaches hide; they will come out at once. Then kill.



Made in Sections of 25, 30 and 35 Teeth, as many
Sections can be connected as desired.

THE COLUMBIA JUNIOR PEG-TOOTH HARROW.



THE COLUMBIA JUNIOR PEG-TOOTH HARROW.



Tooth is Securely Bolted to U-Bar.



A mellow and finely pulverized soil is a necessity for the perfect seed bed, and to insure it the implement best suited for the purpose must be employed. This demands the use of our peg-tooth harrow, noted for thorough and effective work as a pulverizer of the soil simply, or for following a seeder as a coverer.

IT IS ALL METAL; the parts sustaining the hardest usage, **frame, bars, tooth beams and teeth, being made of highly carbonized steel** to meet any demand on the strength and wearing qualities of the implement.



Connection of U-Bar to Harrow Frame.

The angle of the teeth to any pitch desired is regulated by levers on the rear beams, within easy reach.

Whether going over ridges or hollows, the flexibility of the harrow insures a thoroughly pulverized soil.

The tooth beams are cut from U-shaped channel steel bars, to which the teeth are fastened by malleable clips secured to the beams by single bolts.

THE TEETH ARE ALL HEAD-ED and forged of extra hard steel. They are reversible, giving four cutting edges, and by loosening the clips, they can be



Heads are Upset. Cannot lose out.

raised or lowered giving the greatest amount of wear and cutting power of any harrow made. If it is desired to drag the harrow at an angle, the draft ring must be shifted on the chain of the draw bar.

The sections are detachable from the draw bar, and can be used independently as one-horse harrows. From one to four sections are furnished as ordered, with thirty or thirty-five teeth in each section. Each harrow is supplied with a draw bar of proper length. It has no rival of its kind and is an indispensable implement on every farm.



VALUABLE INFORMATION.

MANURES.

Manures—It becomes a matter of the highest consequence to the farmer to understand, not only what substances may be useful as manures, but also how to apply them in the best manner to his crops so far as they may be made profitable.

Home-Made Guano of Unequalled Excellence—Save all your fowl manure from sun and rain. To prepare it for use, spread a layer of dry swamp muck (the blacker it is the better) on your barn floor, and dump on it the whole of your fowl manure; beat it into a fine powder with the back of your spade; this done, add hard wood ashes and plaster (Gypsum) so that the compound shall be composed of the following portions:

Dried Muck, 3 bushels;
Fowl manure, 2 bushels;
Ashes, 1 bushel;
Plaster, 1½ bushels.

Mix thoroughly and spare no labor; for in this matter the elbow grease expended will be well paid for. A little before planting, moisten the heap with water, or, better still, with urine, cover well over with old mats and let it lie till wanted for use. Apply it to beans, corn or potatoes at the rate of a handful to a hill and mix with the soil before dropping the seed. This will be found the best substitute for Guano ever invented and may be depended on for bringing great crops of turnips, corn, potatoes, etc.

To Dissolve Large Bones For Manure Without Expense.

Take any old flour barrel and put into the bottom a layer of hard wood ashes; put a layer of bones on the top of the ashes, filling the space between the bones with them; then add bones and ashes alternately, finishing off with a thick layer of ashes. When your barrel is filled, pour on water (urine is better), just sufficient to keep them wet, but do not on any account suffer it to leach one drop for that would be like leaching your dunghheap. In the course of time they will heat, and eventually soften down so that you can crumble them with your finger. When sufficiently softened, dump them out of the barrel on a heap of dry loam, and pulverize and crumble them up till they are completely amalgamated into one homogeneous mass with the loam so that it can be easily handled and distributed whenever required. You may rely

on it, this manure will leave its mark and show good results wherever it is used.

Substitute for Barn Manure.—Dissolve a bushel of salt in water enough to slack five or six bushels of lime. The best rule for preparing the compost heap is, one bushel of this lime to one load of swamp muck intimately mixed, though three bushels to five loads makes a very good manure. In laying up the heap let the layers of muck and lime be thin, so that decomposition may be more rapid and complete. When lime cannot be got, use unleached ashes, three or four bushels to a cord of muck. In a month or six weeks overhaul and work over the heap, when it will be ready for use. Sprinkle the salt water on the lime as the heap goes up.

Ashes may be pronounced the best of the saline manures. They are also among the most economical; as, from our free use of fuel, they are largely produced by almost every household. Good husbandry dictates that not a pound of ashes should be wasted, but all should be saved and applied to the land; and, where they can be procured at a reasonable price, they should be purchased for manure. Leached ashes, though less valuable, contain all the elements of the unleached, having been deprived only of a part of their potash and soda. They may be drilled into the soil with roots and grain, sown broadcast on meadows or pastures, or mixed with the muck heap. They improve all soils not already saturated with the principles which they contain.

The quantity of ashes that should be applied to the acre must depend on the soil and crops cultivated. Potatoes, turnips and all roots—clover, lucern, peas, beans and the grasses, are great exhausters of the salts and they are consequently much benefited by acids. They are used with decided advantage for the above crops in connection with bone dust; and for clover, peas and roots their effects are much enhanced when mixed with gypsum. Light soils should have a smaller, and rich land or clays, a heavier, dressing. From twelve to fifteen bushels to the acre for the former and thirty for the latter is not too much; or, if they are leached, the quantity may be increased one-half, as they act with less energy. Repeated dressings of acids, like those of lime and gypsum, without a corresponding addition of vegetable or barn-yard manure, will eventually exhaust tillage land.

VALUABLE INFORMATION.

How to Double the Usual Quantity of Manure on a Farm—Provide a good supply of black swamp mould or loam from the woods within easy reach of your stable and place a layer of this, one foot thick, under each horse with litter, as usual, on the top of the loam or mould. Remove the droppings of the animal every day, but let the loam remain for two weeks; then remove it, mixing it with other manure, and replace with fresh mould. By this simple means any farmer can double, not only the quantity, but also the quality of his manure, and never feel himself one penny the poorer by the trouble or expense incurred, while the fertilizing value of the ingredients absorbed and saved by the loam can scarcely be estimated.

Twenty Dollars' Worth of Manure for Almost Nothing. If you have any dead animal, say, for instance, the body of a horse, do not suffer it to pollute the atmosphere by drawing it away to the woods or any other out-of-the-way place, but remove it a short distance only from your premises and put down four or five loads of muck or sods, place the carcass thereon, sprinkle it over with quicklime and cover over immediately with sods or mould sufficient to make, with what has been previously added, twenty good wagon loads, and you will have, within twelve months, a pile of manure worth twenty dollars for any crop you choose to put it upon. Use a proportionate quantity of mould for smaller animals, but never less than twenty good wagon loads for a horse; and if any dogs manifest too great a regard for the enclosed carcass, shoot them on the spot.

Ashes from Soil by Spontaneous Combustion—Make your mound twenty-one feet long by ten and one-half feet wide. To fire use seventy-two bushels of lime. First a layer of dry sods or parings on which a quantity of lime is spread, mixing sods with it, then a covering of eight inches of sods, on which the other half of the lime is spread, and cover a foot thick, the height of the mound being about a yard. In twenty-four hours it will take fire. The lime should be fresh from the kiln. It is better to suffer it to ignite itself than to effect it by the operation of water. When the fire is fairly kindled, fresh sods must be applied, but get a good body of ashes in the first place. I think it may be fairly supposed that the lime adds full its worth to the quality of the ashes, and when limestone can be got I would advise the burning a small quantity in the mounds, which would be an improvement to the ashes, and would help to keep the fire burning.

Old Lime Plaster, from Walls of Buildings, etc.—For meadows, and for most other crops, especially on clays and loams, this is worth twice its weight in hay; as it will produce a large growth of grass for years in succession, without other manure. But the farmer cannot too carefully remember that with this, as with all other saline manures, but a part of the ingredients only is thus supplied to vegetables; and, without the addition of the others, the soil will sooner or later become exhausted.

Saving Barnyard Manure—The bulk, solubility and peculiar tendency to fermentation of barn-yard manure, renders it a matter of no little study so to arrange it as to preserve all its good qualities and apply it undiminished to the soil. A part of the droppings of the cattle are necessarily left in the pasture, or about the stacks where they are fed; though it is better, for the various reasons, that they should never receive their food from the stack. The manure thus left in the field should be beaten up and scattered with light, long handled mallets, immediately after the grass starts in the spring, and again before the rains in the autumn. With these exceptions, and the slight waste which may occur in driving cattle to and from the pasture, all the manure should be dropped either in the stables or in the yards. These should be so arranged that cattle may pass from one directly into the other; and the yard should, if possible, be furnished with wells, cisterns, or running water. There is twice the value of manure wasted annually on some farms in sending the cattle abroad to water, that would be required to provide it for them in the yard for fifty years.

The premises where the manure is dropped should be kept as dry as possible; and the eaves should project several feet beyond the side of the building so as to protect the manure thrown out of the stables from the wash of the rain. The barns and all the sheds should have cave-troughs to carry off the water, which, if saved in a sufficiently capacious cistern, would furnish a supply for the cattle. The form of the yard ought to be dishing toward the center, and, if on sandy or gravelly soil, it should be puddled or covered with clay to prevent the leaching and escape of the liquid manure. The floors of the stable may be so made as to permit the urine to fall on a properly prepared bed of turf under them, where it will be retained till removed: or it should be led off by troughs into the yard or to a muck heap.





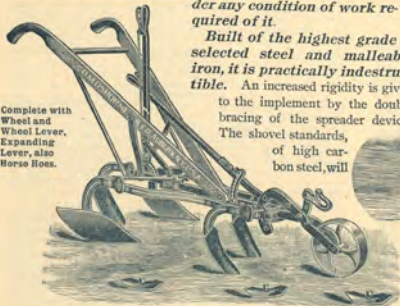
THE OSBORNE COLUMBIA HORSE HOE AND CULTIVATOR.

A necessity in the cultivation of the garden and vineyard.

It is adjustable where required, and can be quickly changed to cultivate between rows planted at various distances apart. *A strong and rigid framing guarantees its durability under any condition of work required of it.*

Built of the highest grade of selected steel and malleable iron, it is practically indestructible. An increased rigidity is given to the implement by the double bracing of the spreader device. The shovel standards, of high carbon steel, will

Complete with
Wheel and
Wheel Lever,
Expanding
Lever, also
Horse Hoes.



not bend or break in any kind of work, and can be adjusted for deep or shallow cultivation, or their work can be regulated by the front wheel, which is also adjustable, and easily attached or detached. *The levers are within easy reach, and quickly*

operative while the cultivator is at work. The handles are made of selected timber and their height can be adjusted to suit short or tall operator. Five different styles are made, either plain and without lever and wheel, or complete with them, to suit choice of customers. They are all warranted to be the best, as to the material of which they are constructed and quality of work, and are the leaders of their class.



That Is Long Fibre.

quality. Every grade is the best that can be produced, and is renowned for strength and durability, whether plain or tarred. Ratlins, Marlines and the different sizes of yarns are a part of our product and are made with the same care and attention to detail that marks the entire output of our factories.

OSBORNE ORBIT OIL.

Oil is life to a machine, without it aggravated friction results and the durability and efficiency of any machine are seriously affected. All the evils that arise from poor oil, are entirely overcome by the use of Osborne Orbit Oil, a pure lubricating fluid, entirely free from grit or a tendency to gum. It is always fluid, flowing easily in either warm or cool weather, and retains its superior lubricating qualities to the very last drop. Being made especially for farm machinery, a single trial always insures its steady use.

It is put up in handsomely decorated cans of one-half gallon, one and five gallons, and in half and full barrels.

TWINE.

The high grade quality of the Osborne Binder Twine has been fixed by the honest fibre of which it is made, its uniform strength, and weight and length to the pound; doubling the capacity of our cordage plant has not enabled us to fully supply the demand for it.

The selected material through its entire course from its reception at the factory to its departure as finished twine ready for the binder, is subjected to the most careful and rigid inspection, and none is allowed to go upon the market that will not sustain the reputation of our popular brand. *It is the product of the most modern machinery, and is smoother, more even and longer to the pound than any other.*

Bundles of corn stalks are much heavier than bundles of wheat or oats, and to meet the requirements of the corn harvest, we manufacture a special brand of twine, known as our Indian Corn Twine.

Indian Corn Twine is slightly heavier than our other brands, and is made with the same careful supervision that characterizes all our other products, it can be used on any Corn Harvester or Binder.

ROPE AND CORDAGE.

We make all sizes of rope and cordage, and our trade mark, upon each bale, is a guarantee of its superior



We know the "Ins and Outs" of the Rope business.





Rules for Measuring Corn in Crib, Vegetables, etc., and Hay in Mow.

This rule will apply to a crib of any size or kind. Two cubic feet of good, sound, dry corn in the ear will make a bushel of shelled corn. To get, then, the quantity of shelled corn in a crib of corn in the ear, measure the length, breadth and height of the crib, inside the rail; multiply the length by the breadth and the product by the height, then divide the product by two, and you have the number of bushels of shelled corn in the crib.

To find the number of bushels of apples, potatoes, etc., in a bin, multiply the length, breadth and thickness together, and this product by eight, and point off one figure in the product for decimals.

To find the amount of hay in mow, allow 512 cubic feet for a ton, and it will come out very generally correct.

Grain Measure.

To find the capacity of a bin or wagon bed, multiply the cubic feet by .3 (tenths). For great accuracy, add $\frac{1}{4}$ of a bushel for every 100 cubic feet. To find the cubic feet, multiply the length, width and depth together.

Cistern Measure.

To find the capacity of a round cistern or tank, multiply the square of the average diameter by the depth, and multiply the product by .166. For square cisterns or tanks, multiply the cubic feet by $\frac{2}{3}$ (tenths).

Measure 209 Feet

on each side and you will have a square acre within an inch.

Measures of Capacity.

DRY.—2150.42 cubic inches equal 1 United States (or Winchester) bushel, the dimensions of which are 18 $\frac{1}{2}$ in. diameter inside, 19 $\frac{1}{2}$ inches outside, and 8 inches deep; 7757.5 cubic inches, 1 heaped bushel, the cone of which must not be less than 6 inches high.

GALLONS.—231 cubic inches equal

1 United States standard gallon; same contains 8.3399 avoirdupois lbs. of distilled water; 1 gallon of ale weighs 10.02 lbs.; 1 gallon of sperm oil 7 $\frac{1}{2}$ lbs.; 1 gallon of linseed oil 7 $\frac{3}{4}$ lbs.; 1 gallon proof spirits 7 lbs. 15 oz.; 1 gallon spirits of turpentine 7 lbs. 3 oz.

Weight of Various Products.

	Per bush.
Wheat	60 lbs.
Corn (shelled)	56 "
" (on the cob)	70 "
Rye	70 "
Barley	56 "
Buckwheat (in Pennsylvania)	48 "
" (in Kentucky)	52 "
" (in Massachusetts)	48 "
Oats (in Ills. and Mass.)	32 "
" (in Ohio)	33 "
" (in Kentucky)	33 $\frac{1}{2}$ "
" (in Maine and Pa.)	30 "
Clover seed	60 "
Flax seed	45 "
Timothy seed	45 "
Hemp seed	48 "
Blugrass seed	14 "
Red top seed	14 "
Hungarian grass seed	50 "
Broom corn seed	52 "
Borghum seed	49 "
Corn meal	50 "
Brass	60 "
Beans	60 "
Onions (in Pa. and Kentucky)	57 "
" (in Massachusetts)	52 "
Salt, Turks Island	76 "
" Syracuse	96 "
" Liverpool	50 "
Potatoes	60 "
Peas	60 "
Dried apples (in Pennsylvania)	14 "
" (in Illinois)	24 "
" Peaches (in Pennsylvania)	33 "
" (in Illinois)	32 "

Square Box Measure.

A box 24 by 16 inches square and 25 inches deep, will contain a barrel (five bushels shelled corn).

A box 24 by 16 inches square and 14 inches deep will contain half a barrel.

A box 16 by 16 $\frac{1}{2}$ inches square and 8 inches deep will contain one bushel.

A box 12 by 11 $\frac{1}{2}$ inches square and 8 inches deep will contain half a bushel.

A box 8 $\frac{1}{2}$ by 8 $\frac{1}{2}$ inches square and 8 inches deep will contain a peck.

A box 8 $\frac{1}{2}$ by 8 $\frac{1}{2}$ inches square and 4 inches deep will contain one gallon.

A box 8 $\frac{1}{2}$ by 4 $\frac{1}{2}$ inches square and 4 inches deep will contain half a gallon.

A box 4 by 4 $\frac{1}{2}$ inches square and 4 inches deep will contain one quart.

Miscellaneous Weights.

Barrel four weighs	166 lbs.
" salt	280 "
" beef	200 "
" pork	200 "
" fish	200 "
Keg powder	75 "
Stone of lead or iron	14 "
Pig	21 $\frac{1}{2}$ stone.
Anthracite coal, broken, cubic foot	averages 54 lbs.
A ton, loose, occupies	40 to 45 cubic ft.
Bituminous coal, broken, cubic ft.	averages 49 lbs.
A ton, loose, occupies	43 to 48 cubic ft.
Cement (Hy.) Rosendale, bush.—	70 lb.
" " Louisville, "	63 "
" " Portland, "	96 "
Gypsum, ground, "	70 "
Lime, loose, "	70 "
Lime, well shaken, "	80 "
Sand at 65 lbs. per cu. ft. bush.—	122 $\frac{1}{2}$ lb.
18.25 bushels—ton.	1.181 ton—cu. yd.
A cable's length	240 yards.
20 articles	=1 score.
12 dozen	=1 gross.
12 gross	=1 great gross.
A cord of wood	=128 cubic ft.
1 hand	=4 inches.
1 span	=9 inches.

Shoemaker's Measure.

No. 1, of small size is 4 $\frac{1}{2}$ inches long.
No. 1, of large size is 8 $\frac{1}{2}$ inches long.
Each succeeding number of either size is $\frac{1}{2}$ of an inch additional length.
60 pairs of shoes = 1 case.

Corn and Hogs.

A bushel of corn will make 10 $\frac{1}{2}$ lbs. of pork, gross. Then:

When corn costs	Pork costs
12 $\frac{1}{2}$ cts. per bushel,	1 $\frac{1}{2}$ ct. per lb.
17 " "	2 " "
25 " "	3 " "
35 " "	4 " "
42 " "	5 " "
50 " "	6 " "

Number of Trees on an Acre.

4 feet apart	2720	15 feet apart	200
5 " "	1749	18 " "	135
6 " "	1200	20 " "	110
8 " "	689	22 " "	70
10 " "	430	30 " "	50
12 " "	345		

Shingles.

The best shingles are of white cedar. When of good quality, they will last 40 to 50 years in our Northern States. Cypress and white pine are much used for shingles, but will not last half as long as white cedar.

Shingles are packed 250 to the bundle, or 4 bundles to 1000.

1 bundle 16-inch shingles will cover 30 square feet.

1 bundle 8-inch shingles will cover 33 square feet.

When laid 5 $\frac{1}{2}$ inches to the weather, 5 lbs. 4 $\frac{1}{2}$ or 3 $\frac{1}{2}$ lbs. 3 $\frac{1}{2}$ nails will lay 1000 shingles.

For Builders.

1000 shingles laid 4 inches to the weather, will cover 100 square feet of surface, and 5 lbs. of shingle nails will fasten them on.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching of the floor.

1000 laths will cover 70 yards of surface, and 11 lbs. of lath nails will nail them on.

8 bushels of good lime, 16 bushels of sand, and 1 bushel of hair, will make enough good mortar to plaster 100 square yards.

A cord of stone, 3 bushels of lime, and a cubic yard of sand will lay 100 cubic feet of wall.

5 courses of brick will lay 1 foot in height on a chimney; 6 bricks in a course will make a flue 4 inches wide and 12 inches long; and 8 bricks in a course will make a flue 8 inches wide and 16 inches long.



Weights and Measures.

The standard Unit of the U. S. and British linear measure is the yard. It was intended to be exactly the same for both countries, but in reality the U. S. yard exceeds the British standard by .0001 inch. The actual standard of length of the U. S. is a brass scale 32 inches long, prepared for the Coast Survey and deposited in the Office of Weights and Measures at the U. S. Treasury Dept., Washington. The yard is between the 27th and 62d inches of this scale. The temperature at which this scale is determined to be standard, and at which it is used in the U. S. Coast Survey, is 62° Fahrenheit.

LONG MEASURE.

fathoms,
12 = 1 foot.
36 = 3 = 1 yard.
720 = 6 = 2 = 1 fathom.
936 = 36.5 = 5.5 = 2.75 = 1 perch or rod.
7920 = 660 = 132 = 66 = 33 = 1 mile.
87120 = 7260 = 1452 = 726 = 363 = 181.5 = 1 c.

GUNTER'S CHAIR.

Inches.
 7 pin a link.
 7 pin in wire & chain.
 7 pin in wire & chain.

NAUTICAL MEASURE.

Nautil. mille.
1 = mille feet.
yoo = 2 leagues.
fooo = 1 day = 24,000 Eng. miles.

THEORY AND PRACTICE

Inches.
 12 in. = 1 foot.
 36 in. = 3 ft. = 1 yard.
 36 in. = 3 ft. = 1 perch.
 12 in. = 1 foot.
 36 in. = 3 ft. = 1 yard.
 36 in. = 3 ft. = 1 perch.

An acre is 48,780 square yards; or,
48,780 feet square.

A township is 36 miles sq., or 36 sections.
A section " 36 " " 3600 acres.
1/4 " " 1/4 " " 900 " "
1/16 " " 1/16 " " 225 " "

SOLUBLE MEASURES.

Cubic inches,
1728 = 1 cubic foot,
46656 = 1 cubic yard.

Davy MEASUREMENT.

Flats weigh 3.6 cubic inches.
 48 = 1 quart = 24 cubic inches.
 2 = 4 = 1 gallon = 48.8 cubic inches.
 120 = 8 = 1 peck = 97.6 cubic inches.
 540 = 32 = 1 bushel.

NOTE.—The standard U. S. bushel is the Winchester bushel, which is in cylinder form, 18½ in. diameter and 6 inches deep, and contains 2150.42 cubic inches.

The English Imperial bushel = $\frac{1}{2}$ cu. ft. or cubic inches.
 2,240 U. S. bushels.

The Eng. quart = $\frac{1}{4}$ Imperial bushel.
 8 $\frac{1}{4}$ (nearly) U. S. bushels.
 29,674 cubic feet.

LIQUID OR WINE MEASURE.

Gills—partly cubic inches.
 4— 1 pint—28.836 cubic inches.
 8— 2— 1 quart—57.672 cubic inches.
 32— 8— 1 gallon.
 surface 414— 273— 6— 1 bushel.
 473— bushels 314— cubic feet 359.
 804— cubic feet 27— 273— 6— 1 acre— 4840 sq. ft.

The following cylinders contain some of these

	Diameter.	Height
Gill,	1 1/2 inches.	3 inches.
Pint,	1 3/4 "	3 "
Quart,	2 1/8 "	4 "
1 Gallon,	2 3/4 "	5 "
5 "	3 1/2 "	12 "
10 "	4 1/2 "	16 "

Shipping Admeasurement.

REGISTER TON.—For register tonnage or for measurement of the entire internal capacity of a vessel.

and public fact—registration.

This number is arbitrarily assumed to facilitate
recognition.

SHIPPING TON.—For the measurement of cargo.

40 cubic feet—	{ 1 U. S. shipping ton. 32.05 Imp. bushels. 30.245 U. S. "
44 cubic feet—	{ 1 British Shipping ton. 30.719 Imp. bushels. 29.95 U. S. "

The U. S. standard of weight is the troy pound and was copied in 1849 from the Imperial troy pound of England for the use of the U. S. Mint, and there deposited. It is standard in air, at 62° Fahr., the barometer at 30 inches.

TROY WEIGHT.

2700-2800 c. per 100 g. of distilled water at 60° Fahr.

AVOIDED/POSS. WEIGHT.

Drachms,
 15m 1 oz. = 480.5 grains Troy.
 25m 15m 1 lb. = 3,603.5 grs. Troy.
 60m 40m 25m 1 quart.
 25m 15m 10m 4m 1 cwt.
 15m 10m 5m 1 ton.

APOTHECARIES' WEIGHT.

1. *Calceolus*.
 2. *Calceolus*.
 3. *Calceolus*.
 4. *Calceolus*.
 5. *Calceolus*.

APOTHECARIES' MEASURE.

60 min.	— 1 fluid drachm.
2 fluid drachms	— 1 fluid ounce.
16 fluid ounces	— 1 pint.
8 pints	— 1 gallon.

45 drops, or a common teaspoonful, make about 1 fluid drachm; a teaspoonful about 1 fluid ounce; a wineglassful about $1\frac{1}{2}$ fluid ounces; and a tumblerful about 4 fluid ounces.

Bible Weights and Measures.

A day's journey	= 31 1/2 U. S. miles.
A Sabbath-day's journey	= 3 miles.
Backlet's reed	= 100 feet nearly.
Cabin-Helweg	= 100 ft.
" Greek	= 100 "
A tiger's breadth	= 7 1/2 "
A shekel of silver	= 1/40 of a talent.
" gold	= 1/200 "
A talent of silver	= 60,000 ps.
" gold	= 120,000 "
A piece of silver	= 3 talents.
A barbing	= 1/2 "
A garah	= 1/2 "
A mite	= 1/1000 millin.
A homer (as dry meas.)	= 1 1/2 bushels.
" (liquid ")	= 4 bushels and 5 pints.
An Ephah or bath	= 1 "
A lue	= 2 "
A ferkim	= 7 "
As omes	= 6 "
" at cub	= 6 "
A log	= 1 "

Wall Paper.

To find the number of double rolls required for a wall, measure every side of the room and add the number of feet; multiply the sum obtained by height in feet; to allow for the doors and windows, multiply the height of each by the width, add all and deduct the sum from the number of feet in the walls; then divide by 72, the number of square feet in a double roll, and the result will be the number of double rolls required for the side walls.

EXAMPLE—Room 15 feet long, 12 feet wide and 10 feet high; two windows 6 by 4 feet; two doors 7½ by 4 feet. 15 plus 15 plus 12 plus 12 equals 54; 54 by 10 equals 540 feet in walls; two doors 7½ by 4 by 2 equals 60; two windows 6 by 4 by 2 equals 48; total 108 feet; 540 less 108 equals 432; 432 divided by 72 equals 6 rolls.

Seed to the Acre.

The opinions of farmers differ materially, and then the climate and soil have much to do with the quantity. The quantity of seed sown broadcast to the acre, is about as follows:

Wheat	1 1/2 to 2	bushels.
Barley	1 1/2 to 2 1/2	"
Oats	1 1/2 to 2	"
Rye	1 to 2	"
Buckwheat	3/4 to 1 1/2	"
Indian Corn	1 1/2 to 2	"
Beans	1 to 2	"
Pose	1 1/2 to 2 1/2	"
Hemp	1 1/2 to 2	"
Timothy	1 1/2 to 2	quarts.
Mustard	1 to 2	"
Kelpop	1 to 2	"
Fat turnip	1 to 2	lbs.
Erd Clover	1 to 2	"
Alfalfa Clover	1 to 2	"
Kentucky blue grass	1 to 2	"
Orchard grass	1 to 2	"

The quantity per acre, when planted in rows, in drills, is about thus:

Broom corn	2	to 1½ bushels.
Beans	1½	to 2 "
Peas	2½	" "
Pennants	2	to 2 "
Galuns	2	to 5 "
Carrots	2	to 1½ "
Parsnips	4	to 5 "
Beets	4	to 6 "



ALL NATIONS ARE LEARNING THIS LESSON.