

OSBORNE -
Farm Implements
SUGGESTED
Where Others Fail.

D.M. OSBORNE & Co's
Handy Book for House & Farm.



CONTENTS.

	Pages.
Osborne Columbia Inclined Corn Harvester and Binder - - - - -	2-5
Osborne Columbia Grain Harvester and Binder - - - - -	10-13
Osborne Columbia Reaper - - - - -	16, 17
Osborne Columbia Mower - - - - -	20, 21
Osborne All-steel Tedders - - - - -	24, 25
Osborne All-steel Self-dump Rakes - - - - -	28-30
Osborne All-steel Hand-dump Rakes - - - - -	30
Osborne Columbia Flexible and Reversible Disc Harrows - - - - -	32, 33
Osborne Rival Disc Harrows - - - - -	36, 37
Osborne Sulky Spring-tooth Harrows - - - - -	40, 41
Osborne Columbia Spring-tooth Harrows - - - - -	44, 45
Osborne Combination Harrows - - - - -	48, 49
Osborne Columbia Peg-tooth Harrows - - - - -	52, 53
Osborne Columbia Horse Hoe Cultivators - - - - -	56, 57
Osborne Columbia Binder Twine, Cordage and Rope - - - - -	60, 61
Osborne Orbit Oil - - - - -	64
Valuable Information for House and Farm:	
How to Build a Silo - - - - -	6-9
Cooking Recipes - - - - -	38, 39, 42, 43, 46, 47, 50, 51, 54, 55, 58, 59, 62, 63
General Information - - - - -	14, 15, 18, 19, 22, 23, 26, 27, 31, 34, 35



PREFACE.

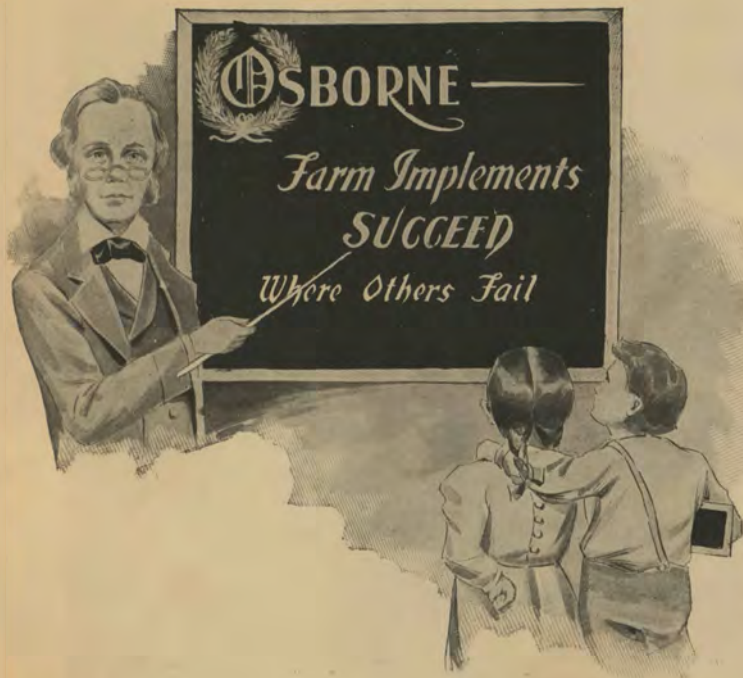
THIS YEAR we have departed from our usual custom regarding the general style of our catalogue, and in furnishing you this issue have sacrificed a large part of the book, usually given to the description of our machines, to what we term "valuable information for house and farm."

If the book finds favor and is of real assistance, to you, we have accomplished our purpose. Still we would like to have told you in detail about the Osborne machines, the finest line of farm implements in the world. However, we hope you may be able to verify for yourself the truth of our statement by giving them

a trial in field service, where they are best appreciated and succeed where others fail.

Respectfully yours,

D. M. OSBORNE & CO.

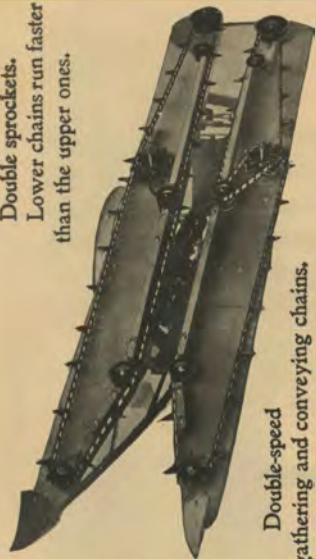




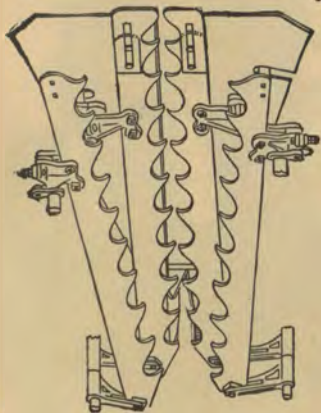
THE OSBORNE COLUMBIA INCLINED CORN HARVESTER AND BINDER.

It has a complete sheaf carrier and drops bundles in rows for shocking.

Double sprockets.
Lower chains run faster
than the upper ones.



Double-speed
gathering and conveying chains.



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



THE OSBORNE COLUMBIA INCLINED CORN HARVESTER AND BINDER.

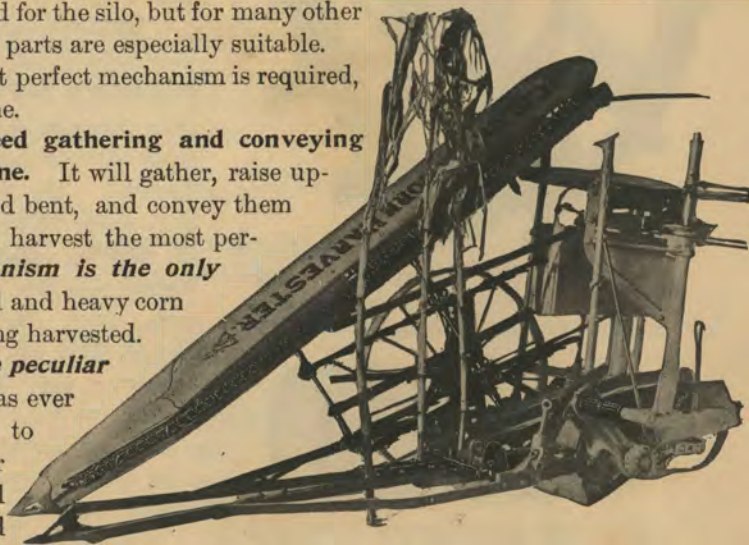
The Osborne Columbia Corn Harvester *cuts corn in an upright and binds it in an inclined position.* It is the only successful way to harvest corn.

The wastefulness that formerly attended the harvesting of corn is disappearing, experiments having demonstrated that *the value of the stalk almost equals the value of the grain itself*, not only as fodder, when shredded or prepared for the silo, but for many other useful purposes for which its component parts are especially suitable.

To save the greatest value the most perfect mechanism is required, and this condition is met by this machine.

The Columbia has a double-speed gathering and conveying mechanism found on no other machine. It will gather, raise upright and cut stalks that are prostrate and bent, and convey them to the inclined binder as easily as it will harvest the most perfect corn. *This double-speed mechanism is the only remedy* to overcome the tendency of tall and heavy corn to fall forward in the machine while being harvested.

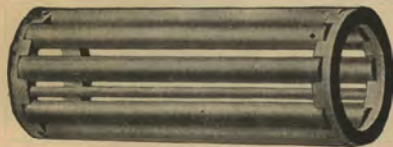
The reciprocating feeding jaws are peculiar to the Columbia, and no other device has ever been constructed to equal their ability to gather and carry the heaviest corn; their action is powerful and positive; they will not clog, for weeds and vines gathered with the corn are cleanly cut, carried along the passage and discharged freely from the machine.



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.



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



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.

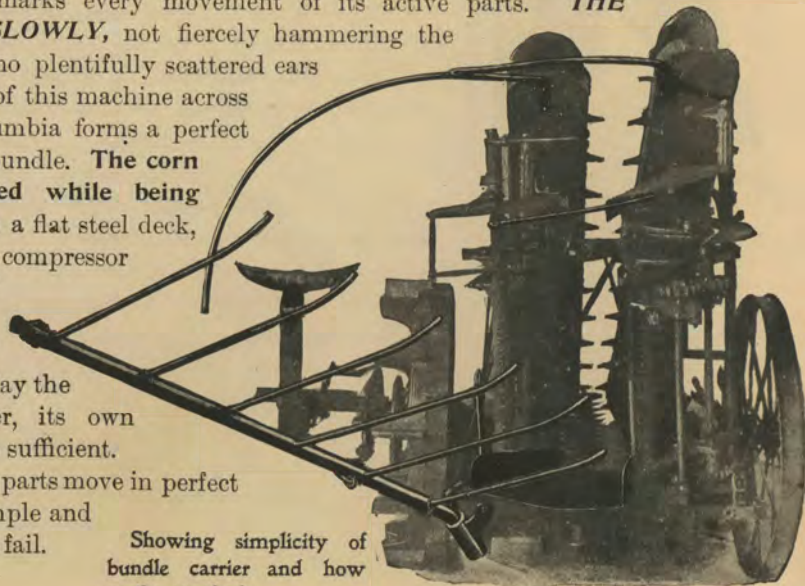
THE DRIVE WHEEL of the Columbia has no equal. The greatest weight of the machine, together with the weight of the driver, are on this wheel. It was designed especially to give the necessary traction power to successfully cut and bind corn under any and all conditions of the crop. **It will not load up with mud,** nor will it slip and slide in soft or muddy soil. The narrow rim sinks through the surface dirt, and the large side lugs taking hold of the hard bottom guarantee a generation of power that never fails.

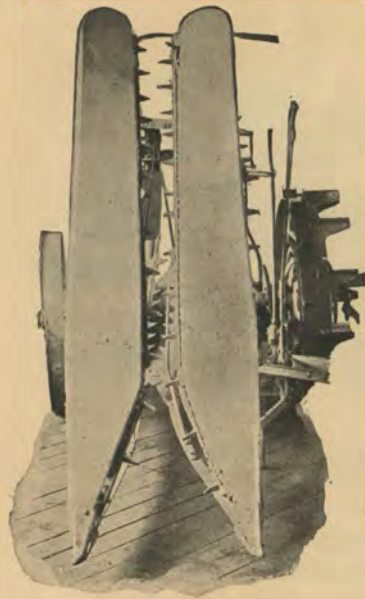
The Columbia is the only rearwardly inclined binder; simplicity combined with effectiveness marks every movement of its active parts. **THE PACKERS RUN SLOWLY,** not fiercely hammering the corn, consequently no plentifully scattered ears mark the progress of this machine across the field. The Columbia forms a perfect and square butted bundle. **The corn is slightly inclined while being bound,** standing on a flat steel deck, and when the compressor swings back out of the way, it only requires a light push of the discharge arms to lay the bundle in the carrier, its own weight being almost sufficient.

All the different parts move in perfect unison; they are simple and compact, and never fail.

Showing simplicity of bundle carrier and how easily attached.

Showing adjustable steel bottom of binder deck.

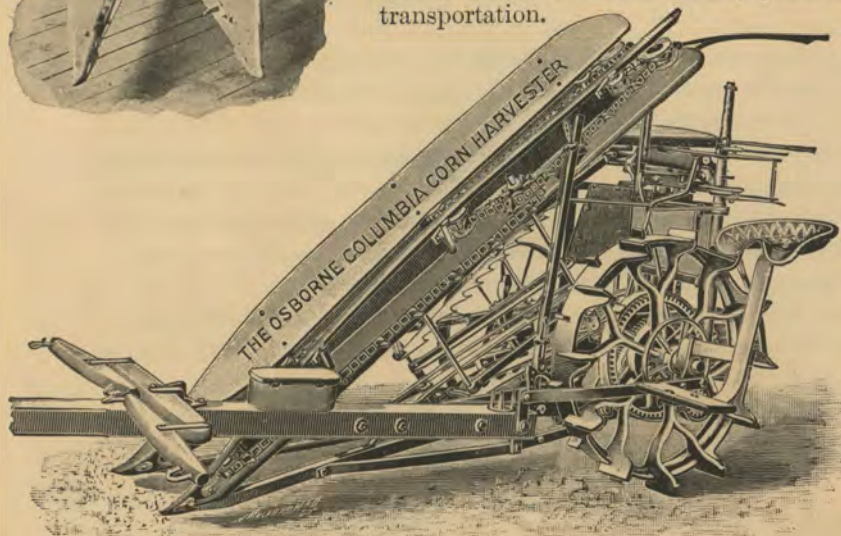




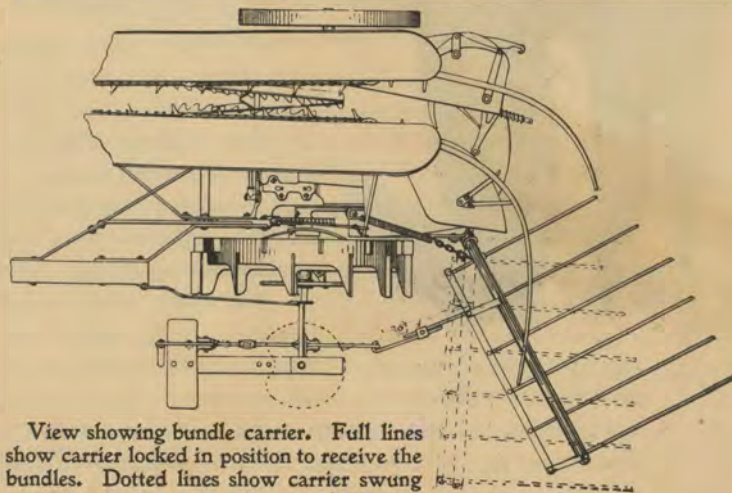
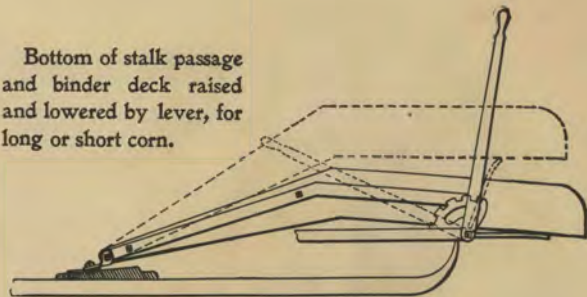
The Columbia is narrow, will cut corn planted in rows twenty inches or more apart, and is especially constructed to open up a corn field, and turn about and pick up the row that passes between the team.

With a lever the binder deck or bottom can be adjusted so that the band can be placed about the center of weight of the bundle.

THE BUNDLE CARRIER attached to the Columbia is the simplest and most perfect ever constructed. It catches and retains the bundle, whether light or heavy, large or small. A slight lift of the driver's foot is sufficient to break the lock joint, and the weight of the bundles, assisted by a spring, dumps the carrier at any point desired. It can be swung up out of the way and secured for transportation.



Bottom of stalk passage and binder deck raised and lowered by lever, for long or short corn.



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.



SILO FOR PRESERVING GREEN FODDER.

During the last few years the value of the corn stalk as fodder for stock has been more than doubled by the introduction and adoption of the silo, in which the plant is stored when it contains the most nutriment, is the most palatable to the cattle, and is preserved in this state to be fed indoors without waste.

A silo is, in effect, a tight box, or chamber, in which green fodder may be stored and preserved. The sides must be smooth and vertical, so that the silage may settle uniformly and freely, and the bottom should be watertight and without drainage; it may be made of any form, provided these essentials are secured.

The only valid argument that can be urged in favor of masonry or concrete for the walls of the silo is that of durability. On the other hand, it must be observed they are good conductors of heat (and frost), and this in itself is an objection.

The quantity of fodder to be ensilaged, and the number of animals it is desirable to provide feed for, should determine the size, general form and proportion of the silo. It would be better to make it so that, by feeding from one end, or from the entire top surface, a fresh layer would be exposed every time the animals are fed. On the whole, several small silos will be found more convenient, so far as the economy of feed and labor is concerned.

The walls of the silo may be 12, 14 or 16 feet high, and it will seldom be advisable to exceed the latter figure. Silos with walls from 20 to 30 feet high have been made, but without any apparent advantage. From the present data, a silo 12 x 16 feet should hold from 46 to 56 tons; one of 12 x 24 feet, over 80 tons; one of 14 x 32 feet, over 125 tons; and one of 16 x 36 feet, over 170 tons. In the reports on feeding silage, the amount fed to a cow per day is usually stated at from 40 to 60 pounds, when supplemented with other feed; 50 pounds per day will, perhaps, fairly represent the average.



Cutting corn in the old, old way,
A weary back, and an acre a day.

At this rate, a cow would consume 1,500 pounds, or three-fourths of a ton, in 30 days, and 20 cows would require half a ton a day, or 15 tons in 30 days. The 56 tons which may be stored in a 12 x 16 feet silo, would serve as the silage ration of 20 cows for over 3½ months.

As wooden silos are, on the whole, to be preferred, we may proceed to consider some of the leading principles involved in their construction. The silo should be made so that it may be classed among the permanent improvements of the farm, and every reasonable precaution should be taken in its construction, to insure the essential qualities of stability and durability. The least expensive structure will not prove to be the cheapest, if these indispensable qualities are not secured.

As a precaution to secure durability, a foundation of masonry or concrete should be laid below frost and carried above the surface high enough to prevent water from settling against the wood-work. Two or three pieces of 2 x 4 inch scantling, one foot long (well coated with pitch), may be laid edgewise, at intervals, along the middle third of the long side, and also near the middle of the end walls, as shown at X, Fig. 5, to serve as anchors to the sills, to prevent them from spreading. It will be safe to use 2 x 4 inch studs for a wall 12 feet high, 2 x 6 inch studs for a wall 14 feet high, and 2 x 8 studs for a wall 16 feet high, if they are in each case placed from 16 to 18 inches apart, from center to center, and sheathed on the inside with two thicknesses of inch boards. The sizes given are in excess, if reasonable care is exercised in other details of construction. The inside sheathing boards should be of uniform width (10 to 12 inches), and surface dressed to secure uniformity in thickness. The sills, two inches thick and of the same width as the studs, are laid on a thin bed of cement mortar, and spiked to the anchor blocks in the foundation. No

Fig. 5, Section of bottom of silo: E, E, earth; F, F, foundation walls; S, S, sills; H, H, studs; X, X, anchors for sills; C, C, concrete floor.



Good air, good light, good care, good stock.

framing or lapping of the sills is required, but where they abut at the corners or on the sides, if the silo is longer than a single scantling, they are fastened together by toe-nailing. When the sills are in place, set the end studs (A, A, A, Fig. 6), one at



a time, flush with the inside of the sill, fasten the lower ends by toe-nailing on each side, and keep them plumb by suitable stay laths. Then put on the bottom board (X, Fig. 6), of the inside sheathing, with the lower edge resting on the foundation wall, and nail it to both sill and studs to bind all strongly together.

If the silo is in the barn the outside of the studs need not be covered with sheathing; but if it is an independent structure, the outside sheathing will form a desirable protection from frost and driving storms. It may be of vertical boards with the joints battened by toeing horizontal laps of 2 x 4 inch scantling at convenient distances between the studs, or, to secure greater strength, the horizontal siding with rabbeted edges may be used. The corners may be made secure by nailing the siding to a 2 x 4 inch stud, as shown at C, Fig. 6.

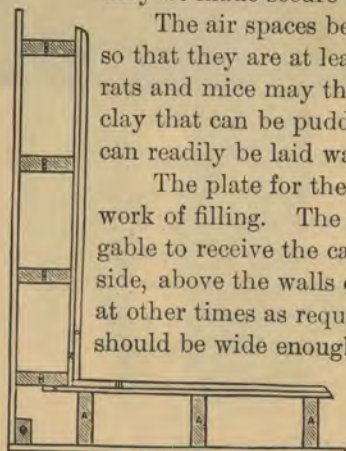


Fig. 6. Plan of silo showing construction of corners: A, A, A, B, B, B, B, studs; X, II, III, IV, inside sheathing boards; C, corner stud for outside sheathing.

The air spaces between the studs should never be filled with sawdust or other materials, but they should be closed in so that they are at least vermin proof. This can be done with a little care in construction, and a serious annoyance from rats and mice may thus be avoided. The concrete is not absolutely necessary, and is often omitted when the bottom is clay that can be puddled and packed. A pitched plank floor would have advantages as a non-conductor of heat, and it can readily be laid water-tight in a thin bed of cement mortar, and spiked to ribs of 2 x 4 scantling bedded in the concrete.

The plate for the roof to rest on should be at least three feet above the top of the silo proper, to give head room in the work of filling. The general plan of the doors is indicated in the diagram, Fig. 8. The large door, B, in the gable to receive the carrier from the cutting machine in filling, needs no description. Similar doors on each side, above the walls of the silo proper, will be found convenient for admitting light when filling the silo, and at other times as required. The long door, A, in the wall of the silo, to give access to the silage in feeding out, should be wide enough to admit a truck (in the form of an oblong box on three wheels, two of them under one end and one at the other), and it should extend from the sill to within two and one half or three feet of the top of the silo. This door is, in effect, but a section of the inside sheathing, with its middle layer of tarred roofing paper, that can be removed in pieces, but which, when in place, protects the silage as completely from atmospheric contaminations as any other portion of walls.

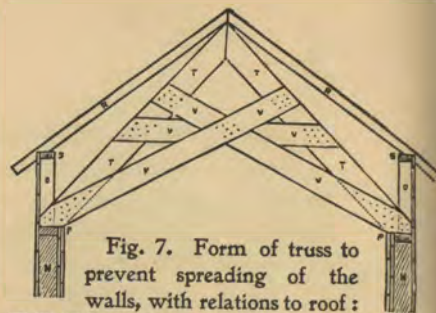


Fig. 7. Form of truss to prevent spreading of the walls, with relations to roof: T, T, T, T, 2x10 scantling; V, V, V, V, V, 1x12 boards, forming the truss; N, N, studs of silo proper; P, P, main plates; O, O, studs for roof; S, S, upper plates; R, R, rafters.



Fig. 8. Diagram of end elevation, showing plan of doors.



The most complete and satisfactory arrangement in caring for stock is shown in the illustration at the right, where, in addition to the trough "A" for grain, hay, ensilage or any other fodder, the manger is also provided with a supply of water in trough "B."

Farmers find their stock will thrive better and on less feed when they are not exposed to the storm and cold, and are provided with a reasonable amount of good water. Of course, this convenience cannot be had in all localities, but it can be provided in many places and with slight expense.



Showing a square silo built in the corner of the mow. Easy to fill from upper floor, and the ensilage easily delivered to cattle on lower floor.



A, feed trough; B, water trough.

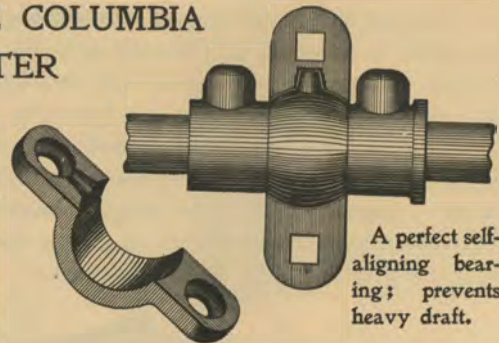


Actual field scene, showing great capacity of elevators and binder.
It will not clog. All levers within easy reach of the driver.

THE OSBORNE COLUMBIA HARVESTER AND BINDER.

*THE ACKNOWLEDGED LEADER OF
HARVESTING MACHINES.*

*A marvel of beauty
and mechanical perfection.*



A perfect self-aligning bearing; prevents heavy draft.

This machine has been extensively manufactured for the past four years, and sold in every country where grain is grown. From its introduction its progress has been an unbroken series of triumphs.

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

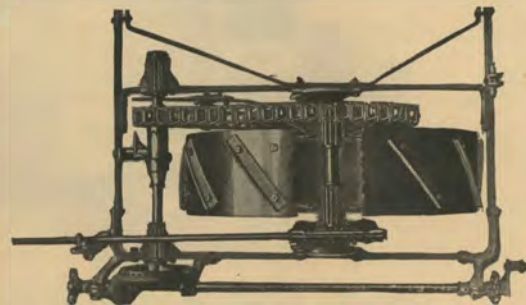
These, in connection with other improvements, make the Columbia the lightest running binder made. Two horses draw it with ease.

THE MAIN FRAME of the Columbia is a special channel steel bar, strongly braced, made from *two pieces solidly riveted together*, and designed for strength and lightness.



Our patented roller bearing. Impossible for rollers to lose out.

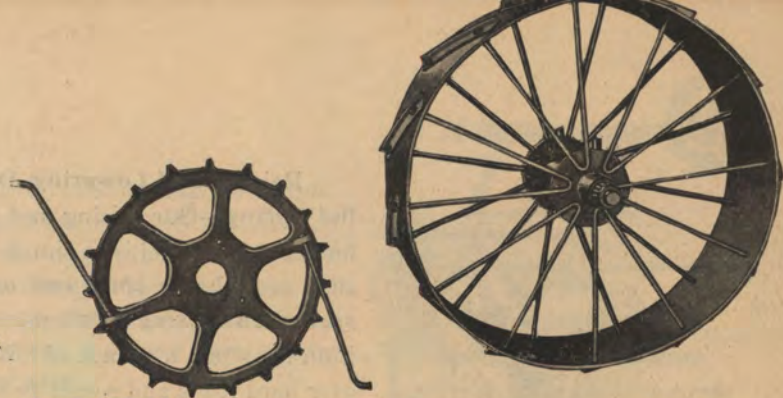
By means of an adjustable malleable bracket on the rear of the main frame the gears can always be kept in perfect mesh.



Plan view of main frame and road wheel, showing roller bearings on main and second shafts.



Perfect work done by the Columbia.



Main drive wheel with large sprocket removed, showing fastenings of steel suspension spokes.

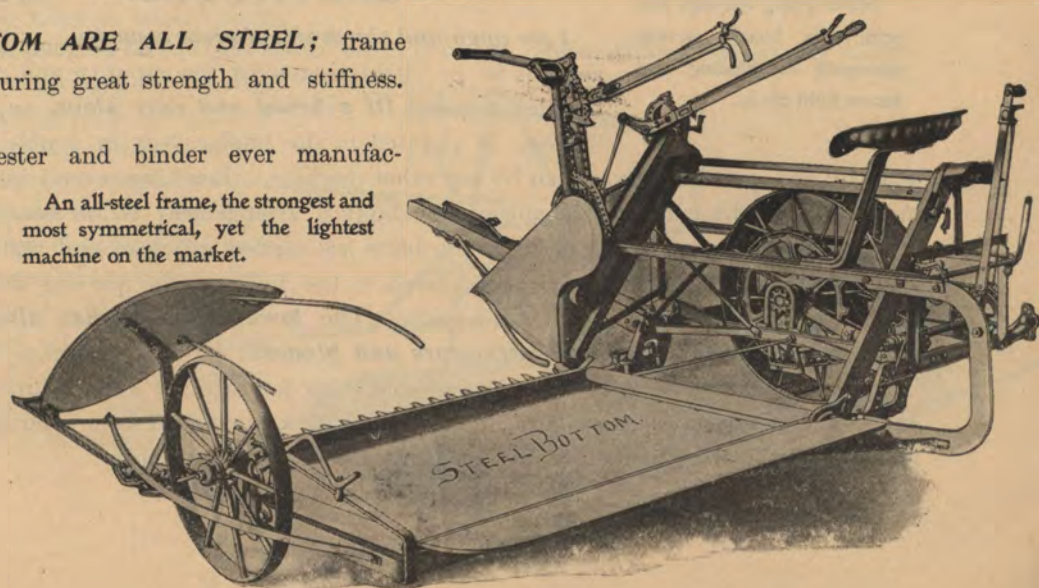
The large main drive sprocket is bolted securely to the hub of the main drive wheel and secured to rim by two strong steel stay rods, thus pulling from rim of the wheel and relieving the hub of all torsional strain.

PLATFORM FRAME AND BOTTOM ARE ALL STEEL; frame made from special shaped steel bars, insuring great strength and stiffness. *It will not sag or twist out of shape.*

The **Columbia** is the only harvester and binder ever manufactured *absolutely free from side draft and neck weight.* The seat is adjustable forward and back. The foot rest is adjustable independent of the seat, to suit length of the driver's leg.

The pole is so located that the machine is always kept in perfect balance, whether tilted up or down.

An all-steel frame, the strongest and most symmetrical, yet the lightest machine on the market.





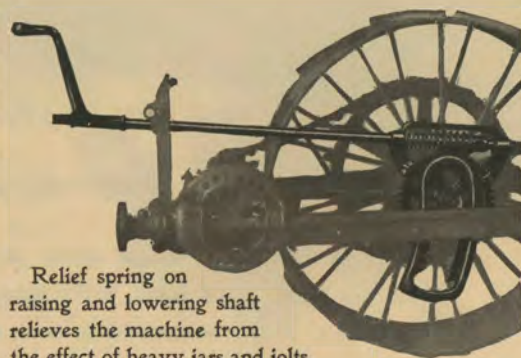
Self-aligning bearings and removable boxes prevent cramping or binding and insure light draft.

Raising and Lowering Device with Relief Spring—Our raising and lowering device for the main wheel is so simple and works with such ease that *a child can operate it*. The *spring on raising shaft* relieves the machine from the strain and rack of heavy jars and jolts over hard roads and rough fields.

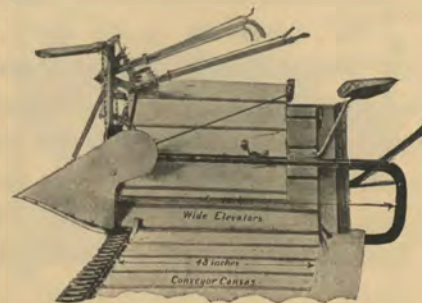
LOW OPEN-END ELEVATORS.

Low open-end elevators, of great capacity,

account in no slight degree for the rapidity and thoroughness with which the Columbia handles a crop. *Of a broad and easy slope*, any length of grain, from the shortest to the longest, is elevated to the binder deck in double the quantity and with less power than by any other machine. Reaching several inches in advance of the cutting mechanism, no claptrap arrangement is necessary to prevent choking, for it never occurs; the butts are carried up clean and regular. The upper elevator is readily accommodated to the bulk of the passing straws without breaking them or hulling the grain. *The lower elevator has always been noted on the Osborne harvesters and binders*; its broad surface and lifting power have stood for years the severest tests for capacity and endurance, and the auxiliary roller at the edge of the binder deck has added to its reputation for carrying the grain to the binding mechanism without losing a spear.



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



Low open-end elevator with the greatest capacity of any machine made.

THE REEL.

Perfect cutting is impossible without a perfect reel. And a reel, to be perfect, **must be simple, and easily and quickly adjusted.** The Columbia, with only one lever for all its movements, requires one hand only for its adjustment, forward or back, up or down, and it is firmly locked wherever placed. The reel has double sprocket, giving two speeds. The slow speed is ordinarily used ; but in very light, or in down and tangled grain, the faster speed will be found of great advantage. **Its balance is perfect, a strong steel spring equalizing its weight at any point.**

THE COLUMBIA BINDER ATTACHMENT has a chain drive. It has *no eccentric sprocket, no bevel gears or lever movement.*

It is so constructed that the weight is carried near the center of the harvester, throwing none on horses' necks.

The packers on the Columbia run 25 per cent. slower than those on any other machine, giving a smooth and easy movement to the grain—not pounding or threshing it—and as they are speeded in unison with the butter, they form

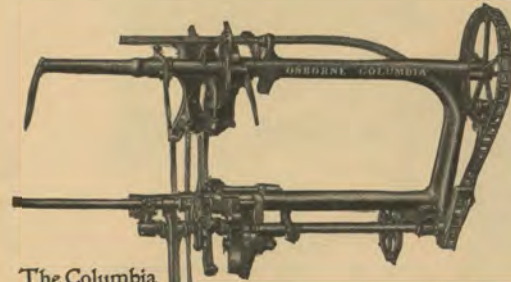
a shapely and square butted bundle. The low elevation and easy slope of the elevators, the self-aligning bearings and the slow motion of the packers, all combine to make the Columbia of light draft.

The Columbia has a 34-inch main wheel, all steel, with strong suspension spokes and roller bearings. Adjustable bracket on corner of main frame ; gears can always be kept in mesh.

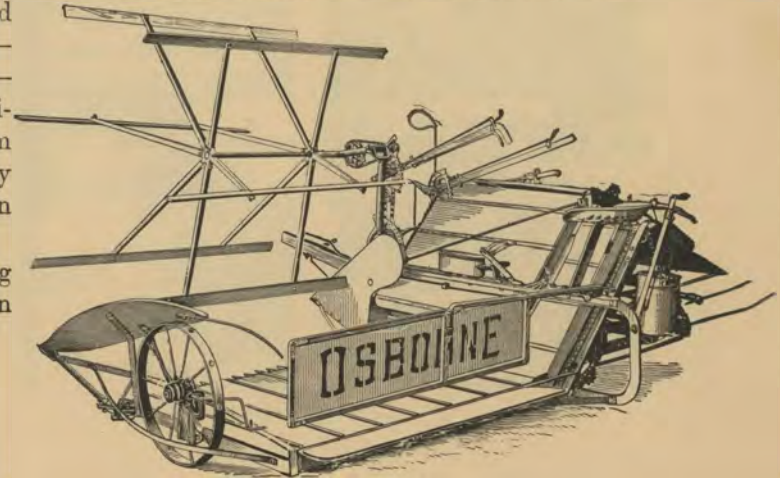
A straight drive pitman avoids friction, saves power.



A perfect one-lever, four-motion reel ; light but very strong ; mounted on steel shaft, with two hubs for reel arms.



The Columbia binder attachment has fewer parts, and combines the bundle with less power, than any other binder made.





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 .8 (tenths). For great accuracy, add $\frac{1}{2}$ 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 .865. For

square cisterns or tanks, multiply the cubic feet by .2% (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; 2747.70 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 8.3389 avoirdupois lbs. of distilled water; 1 gallon of ale weighs 10.05 lbs.; 1 gallon of sperm oil 7 $\frac{1}{4}$ 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. 5 oz.

Weight of Various Products.

	Per bush.
Wheat	60 lbs.
Corn (shelled)	56 "
" (on the cob)	70 "
Rye	56 "
Barley	48 "
Buckwheat (in Pennsylvania),	52 "
" (in Kentucky)	60 "
" (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	56 "
Timothy seed	45 "
Hemp seed	48 "
Bluegrass seed	14 "
Red top seed	14 "
Hungarian grass seed	50 "
Broom corn seed	52 "
Sorghum seed	40 "
Corn meal	50 "
Bran	20 "
Beans	60 "

Onions (in Pa. and Kentucky)	57 lbs.
" (in Massachusetts)	52 "
Salt, Turks Island	76 "
" Syracuse	56 "
" Liverpool	50 "
Potatoes	60 "
Peas	64 "
Dried apples (in Pennsylvania)	22 "
" (in Illinois)	24 "
" peaches (in Pennsylvania)	33 "
" (in Illinois)	32 "

Square Box Measure.

A box 24 by 16 inches square and 28 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 $\frac{1}{4}$ inches square and 8 inches deep will contain one bushel.

A box 12 by 11 $\frac{1}{4}$ 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 flour weighs	196 lbs.
" salt	280 "
" beef	200 "
" pork	200 "
" fish	200 "
Keg powder	25 "
Stone of lead or iron	14 "
Pig	21 $\frac{1}{2}$ stone.
Anthracite coal, broken, cubic ft.	averages 54 lbs.
A ton, loose, occupies 40 to 43 cubic ft.	
Bituminous coal, broken, cubic ft.	averages 49 lbs.
A ton, loose, occupies 43 to 48 cub. ft.	
Cement (Hy.) Rosendale, bush.—70 lb.	
" " Louisville, " —62 "	
" " Portland, " —96 "	
Gypsum, ground, " —70 "	
Lime, loose, " —70 "	
Lime, well shaken, " —80 "	

Sand at 98 lbs. per cu. ft. bush.—122 $\frac{1}{2}$ lb 18.29 bushel.—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 $\frac{1}{4}$ 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 $\frac{1}{2}$ cts. 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 " " 325	

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 18-inch shingles will cover 33 square feet.

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

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 .0087 inch. The actual standard of length of the U. S. is a brass scale 82 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 63rd inches of this scale. The temperature at which this scale is designed to be standard, and at which it is used in the U. S. Coast Survey, is 62° Fahrenheit.

LONG MEASURE.

Inches.	12 = 1 foot.
36 = 3 = 1 yard.	
72 = 6 = 2 = 1 fathom.	
198 = 16.5 = 5.5 = 2.75 = 1 perch or rod.	
792 = 660 = 220 = 110 = 40 = 1 furl.	
63360 = 5280 = 1760 = 880 = 320 = 8 = 1 m.	

GUNTER'S CHAIN.

Inches.	7.92 = 1 link.
792 = 100 = 1 chain.	
360 = 8000 = 80 = 1 mile.	

NAUTICAL MEASURE.

Naut. mile.	1 = 6086 feet.
3 = 1 league.	
60 = 20 = 1 deg. = 69.16 Eng. miles.	

SQUARE MEASURE.

Inches.	144 = 1 foot.
1296 = 9 = 1 yard.	
39204 = 272.25 = 30.25 = 1 perch.	
1568160 = 10890 = 1210 = 40 = 1 rod.	
6272640 = 43560 = 4840 = 160 = 4 = 1 acre.	
An acre is 69,5701 yards square; or,	
208,710321 feet square.	

A township is 6 miles sq. = 36 sections.	
A section " " " " = 640 acres.	
$\frac{1}{4}$ " " " " = 160 "	
$\frac{1}{16}$ " " " " = 40 "	

SOLID MEASURE.

Cub. inches.	1728 = 1 cub. foot.
46656 = 27 = 1 cub. yard.	

DRY MEASURE.

Pints = 33.6 cub. inches.	
2 = 1 quart = 67.2 cub. inches.	
8 = 4 = 1 gallon = 268.8 cub. inches.	
16 = 8 = 2 = 1 peck = 537.6 cub. inches.	
64 = 32 = 8 = 4 = 1 bushel.	

Note.—The standard U. S. bushel is the Winchester bushel, which is in cylinder form, 18 $\frac{1}{4}$ in. diameter and 8 inches deep, and contains 2150 42-100 cub. inches.

The English Im-	perial bushel = { 2218.192 cub. ins.
	1.03152 U. S. bushels.

The Eng. quarter = { 8 Imperial bushels.	
	8 $\frac{1}{4}$ (nearly) U. S. bushels.
	10.2694 cubic feet.

LIQUID OR WINE MEASURE.

Gills = 7.2187 cub. ins.	
4 = 1 pint = 28.875 cub. ins.	
8 = 2 = 1 quart = 57.75 cub. ins.	
32 = 8 = 4 = 1 gallon.	
2016 = 404 = 252 = 63 = 1 hoghead.	
4032 = 1008 = 504 = 126 = 2 = 1 pipe.	
8064 = 2016 = 1008 = 252 = 4 = 2 = 1 tun.	

The following cylinders contain some of these measures very closely :

	Diameter.	Height.
Gill,	1 $\frac{1}{4}$ inches.	3 inches.
Pint,	3 $\frac{1}{4}$ "	3 "
Quart,	3 $\frac{1}{4}$ "	6 "
1 Gallon,	7 "	12 "
8 "	14 "	12 "
10 "	14 "	15 "

Shipping Admeasurement.

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

100 cubic feet = 1 register ton.

This number is arbitrarily assumed to facilitate computation.

SHIPPING TON.—For the measurement of cargo :

40 cubic feet = { 1 U. S. shipping ton.	
	31.16 imp. bushels.
	32.143 U. S. "
42 cubic feet = { 1 British shipping ton.	
	32.719 imp. bushels.
	33.75 U. S. "

The U. S. standard of weight is the troy pound and was copied in 1827 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.

Grains.	24 = 1 dw.
480 = 20 = 1 oz.	
5760 = 240 = 12 = 1 lb. = 22.816 cub. in. of distilled water at 62° Fahr.	

AVOIRDUPOIS WEIGHT.

Drachms.	16 = 1 oz. = 437.5 grains troy.
256 = 16 = 1 lb. = 1.2153 lb. troy.	
6400 = 400 = 25 = 1 quarter.	
25600 = 1600 = 100 = 4 = 1 cwt.	
512000 = 32000 = 2000 = 80 = 20 = 1 ton.	

APOTHECARIES' WEIGHT.

Grains.	20 = 1 scruple
60 = 3 = 1 drachm.	
480 = 24 = 8 = 1 oz.	
5760 = 288 = 16 = 12 = 1 lb.	

APOTHECARIES' MEASURE.

60 min.	= 1 fluid drachm.
8 fluid drachms	= 1 fluid ounce.
16 fluid ounces	= 1 pint.
8 pints	= 1 gall.
45 drops, or a common teaspoonful, make about 1 fluid drachm; 2 tablespoonfuls about 1 fluid ounce; a wineglassful about 1 $\frac{1}{2}$ fluid ounces; and a teaspoonful about 4 fluid ounces.	

Bible Weights and Measures

A day's journey	= 33 1-5 U. S. miles.
A Sabbath-day's journey	= 1 " "
Ezekiel's reed	= 11 feet nearly.
Cubit — Hebrew	= 22 in. "
" Greek	= 18 " about.
A finger's breadth	= 62 $\frac{1}{2}$ cents.
A shekel of silver	= \$8.09.
A talent of silver	= \$1,518.32.
" gold	= \$23,309.
A piece of silver	= 13 cents.
A farthing	= 3 "
A gerah	= 2 $\frac{1}{2}$ "
A mite	= 1 $\frac{1}{4}$ mills.
A homer (as dry meas.)	= 11 1-9 bushels.
" (" liquid ")	= 76 gal. and 5 pints.
An ephah or bath	= 7 " 4 "
A hin	= 1 " 2 "
A firkin	= 7 "
An omer	= 6 "
A cab	= 3 "
A log	= 3 $\frac{1}{4}$ "



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 $\frac{1}{4}$ to 2 bush.
Barley.....	1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ "
Oats.....	2 to 4 "
Rye.....	1 to 2 "
Buckwheat.....	3 $\frac{1}{2}$ to 1 $\frac{1}{2}$ "
Millet.....	1 to 1 $\frac{1}{2}$ "
Indian corn.....	1 to 2 "
Beans.....	2 to 3 "
Peas.....	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$ "
Hemp.....	1 to 1 $\frac{1}{2}$ "
Flax.....	3 $\frac{1}{2}$ to 2 "
Timothy.....	12 to 24 quartis.
Mustard.....	8 to 20 "
Redtop.....	12 to 16 "
Flat turnip.....	2 to 3 lbs.
Red clover.....	10 to 16 "
White clover.....	3 to 4 "
Kentucky blue grass.....	10 to 15 "
Orchard grass.....	20 to 10 "

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

Broom corn.....	1 to 1 $\frac{1}{2}$ bush.
Beans.....	1 $\frac{1}{2}$ to 2 "
Peas.....	1 $\frac{1}{2}$ to 2 "
Peanuts.....	1 to 2 "
Onions.....	4 to 5 lbs.
Carrots.....	2 to 2 $\frac{1}{2}$ "
Parsnips.....	4 to 5 "
Beets.....	4 to 6 "



THE OSBORNE COLUMBIA REAPER.

The highest degree of perfection ever reached in a reaper is found in the Columbia, and its position as a favorite among agriculturists proves that all its superior merits are fully appreciated.

The broad-faced main wheel that furnishes power to all the operating parts is strong and solid ; the spur wheel and pinion are covered, to keep dirt and trash from clogging them, and so impairing the efficiency of the machine.

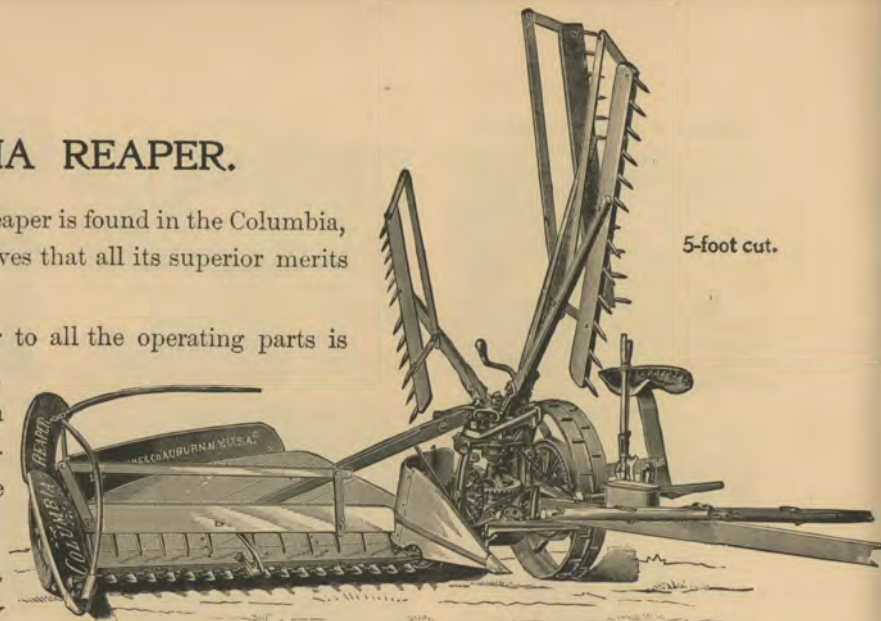
**THE PLATFORM IS STRONG-
ER AND LIGHTER THAN ANY**

OTHER; the front sill and cutter bar are never out of line, a steel truss rod preventing any tendency to sag or warp.

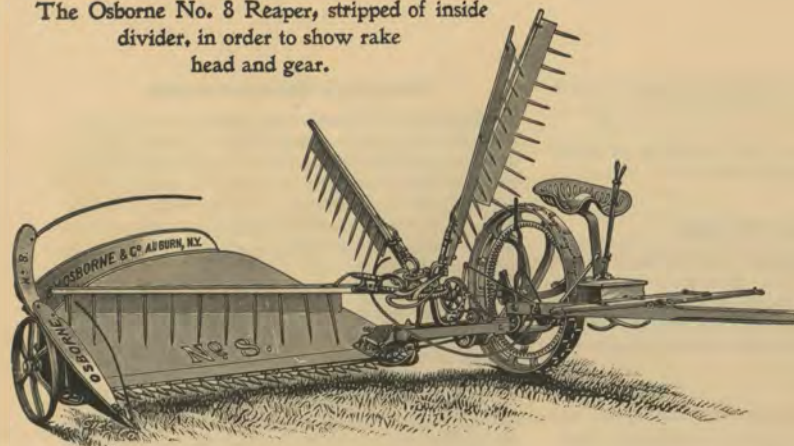
The rake head is high, and has adjustable brace rods, so that the rakes can always be regulated to sweep the platform close and clean.

The automatic trip device cannot be equalled for perfect action ; a simple latch, set at any desired point, determines the operation of the rakes, whether they are to act successively or at intervals ; it can also be tripped to act by the driver's foot when gathering a thin crop and the gavel is allowed to accumulate to a sufficient size.

Rake head complete. Heavy lines show the lever on automatic trip, and adjusting brace rods.

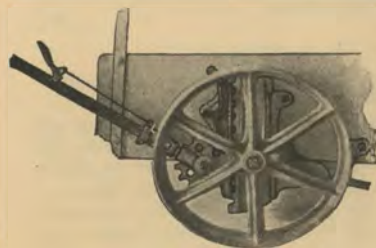


The Osborne No. 8 Reaper, stripped of inside divider, in order to show rake head and gear.



the grain wheel; a child's strength is more than sufficient to operate either.

THE CUTTING MECHANISM is of the same style, quality and popularity that distinguish all our harvesting machines; every part of it is made in our own shops, of selected material. It will do better cutting, and last longer, than that made by any one else.



Easy and convenient raising and lowering device for grain wheel.

The platform folds easily, and can be raised quickly and secured for transportation through narrow gates or over highways.

The gearing is simple, compact and positive in action, and, with the rake head, is located close to the drive wheel, a fact that, combined with the accurate balance of the machine, destroys all possibility of side draft.

THE HIGH INNER DIVIDER PREVENTS STALKS OR GRASS CLOGGING THE GEARING; both dividers are light, high and effective.

The raising and lowering devices are the best ever devised; the turning of a crank is all that is necessary to adjust the main wheel, and a simple hand lever regulates

Osborne Columbia Reaper folded for transportation.





What a Horse Would Say.

Don't hitch me to an iron post or railing when the mercury is below freezing. I need the skin on my tongue.

Don't leave me hitched in my stall at night with a big cob right where I must lie down. I am tied and can't select a smooth place.

Don't compel me to eat more salt than I want, by mixing it with my oats. I know better than any other animal how much I need.

Don't think because I go free under the whip that I don't get tired. You would move up if under the whip.

Don't think because I am a horse that iron weeds and briars won't hurt my hay.

Don't whip me when I get frightened along the road, or I will expect it next time and perhaps make trouble.

Don't trot me up hill, for I have to carry you and the buggy and myself, too. Try it yourself some time. Run up a hill with a big load.

Don't keep my stable very dark, for when I go into the light my eyes are injured, especially if there be snow on the ground.

Don't say "Whoa" unless you mean it. Teach me to stop at that word. It may check me if the lines break, and save a runaway and smashup.

Don't make me drink ice-cold water, nor put a frosty bit in my mouth. Warm the bit by holding it a half minute against my body.

Don't ask me to back with blinds on. I am afraid to.

Don't run me down a steep hill, for if anything should give away I might break your neck.

Don't put on my blind bridle so that it irritates my eyes, or so leave my forelock that it will be in my eyes.

Don't be so careless of my harness as to find a great sore on me before you attend to it.

Galls on Horses.

"The horse is galled and still we need him in the collar daily." All right. Keep on working him, only sponge the galls two or three times daily in cold water and cover them with powdered sulphur. The sore spots will callous over, become tough and heal in spite of the work.

A sheltered yard, where the work horses can be given a short outing, even on disagreeable days, with other yards where the stock sheep can be let out long enough, at least, to eat their grain while the hay is being put into the racks, and to drink from the smoking trough, is good for the stock and convenient for the feeder.

In many stables the horse stalls are too narrow and too short. They should be at least six feet wide, so the horses can stretch themselves out on their sides, and long enough to prevent their being trampled upon or kicked by their neighbors when lying down.

Advantage of Warm Feed.

Giving warm feed to young animals not disposed to be thrifty will very often have a happy effect. These animals may suffer from weak digestion, which in turn produces a poor appetite. The animal does not eat heartily, and what it does eat is not well digested. A hot mess some cold morning sharpens the appetite and tones up the digestion.

Whipping Balky Horses.

Notwithstanding the fact that the press continually admonishes whom it may concern that it does no good to whip or pound a balky horse, almost every owner or driver of one does it to-day. It is probably the greatest piece of horse folly in existence. It is not a remnant of barbarism, but it is continued barbarity, and brings out what original sin there is in a man.

The brain of a horse can retain but one idea at a time. If the idea is to sulk, whipping only intensifies it. A change of that idea, then, is the only successful method of management. This may be accomplished in scores of ways, a few of which are here named:

Tie a handkerchief about his eyes; tie his tail to the belly-band or back-band; fasten a stick in his mouth; tie a cord tightly about his leg; clasp his nostrils and shut his wind off until he wants to go; unhitch him from the vehicle and then hitch him up again, or almost any way to get his mind on something else.

Whipping or scolding always does harm. The treatment should always be gentle. There are more balky drivers than horses.

Carrots for Horses.

Nothing is better for horses in winter than carrots. They help to regulate the bowels, make the coat shiny, and keep the horse in good condition. They seem to possess qualities which no other root or vegetable has. While being a rather expensive food to grow, yet they pay well. Two or three every day, or every other day, are all that it is necessary to feed. Plant a quarter or a half an acre, or more, and put the rows wide enough to allow of cultivation with a horse.

Keep the Carriage New.

The preservation of a carriage depends largely upon the way in which it is housed. The barn or shed should be airy and dry, with a moderate admission of light, otherwise the colors of painting and lining will be affected. Do not let the vehicle be rolled near a brick wall, as the dampness of the wall will fade the colors and destroy the varnish. The coach house should not be connected with the stable or next the manure pit, since the ammonia fumes rising from manure will do more to crack and ruin varnish, and ruin colors of paint and lining, than all other causes put together.

Do not allow mud to dry on a newly varnished carriage; spots and stains will be the result if you do. Do not permit water to dry of itself on a varnished surface, but remove all moisture with a chamois leather only, after the soft sponge has been used. Do not let the leather top carriages lie long unused with the tops down, but raise occasionally, taking off the strain on the leather and set-stay by slightly easing the joints. Keep the moths out of cushions and linings by frequent brushing. Examine the axles often; keep well oiled and see that the washers are in good order.

Oiling Harness.

Unbuckle every strap, and wash carefully with water, castile soap, and sponge or cloth. Allow to dry for five or ten minutes. Then oil, rubbing every part of the harness, except the patent leather, with a cloth well soaked in neatfoot oil, or pour out two or three quarts of oil into a pan and draw each piece through it slowly, bending and rubbing the strap. The buckle holes should have a little extra oil, also the belly bands, breeching and the straps that buckle to the bits. To give the leather a new look, add to one pint of oil a large teaspoonful of lampblack and an ounce or two of beeswax.

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.

Scale of Points for Judging Cows.

POINTS.	COUNTS.
1. Head small, lean and rather long	2
2. Face dished, broad between the eyes and narrow between the horns	1
3. Muzzle dark and encircled by light colors	1
4. Eyes full and placid	1
5. Horns small, coupled with amber color	3
6. Ears small and thin	1
7. Neck straight, thin, rather long, with clean throat and not heavy at the shoulders	4
8. Shoulders sloping and lean, withers thin, breast neither deficient or beefy	3
9. Back level to the setting on of tall and broad across the loin	4
10. Barrel hooped, broad and deep at the flank	8



Osborne Flexible Harrows

on the ranch of J. Grundike, La Costa, Cal.

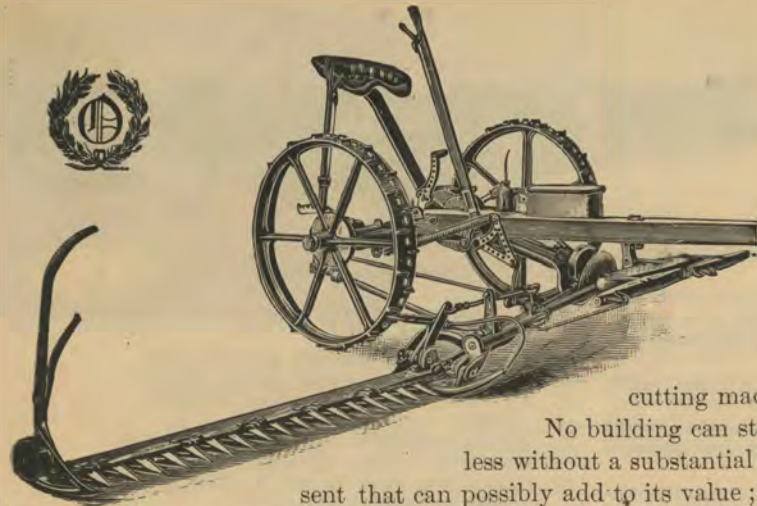
POINTS.	COUNTS.
11. Hips wide apart, and fine in the bone; rump long and broad	4
12. Thighs long, thin and wide apart with legs standing square, and not to cross in walking	4
13. Legs short, small below the knees with small hoofs	3
14. Tail fine, reaching the hocks with good switch	3
15. Hide thin and mellow, with fine, soft hair	4
16. Color of hide where the hair is, white; on udder and inside of ears, yellow	5
17. Fore udder full in form, and running well forward†	8
18. Hind udder full in form and well up behind†	8
19. Udder free from long hair and not fleshy†	5
20. Teats rather large, wide apart and squarely placed	6
21. Milk veins prominent†	5
22. Escutcheon high and broad, and full on thighs	8
23. Disposition quiet and good natured	3
24. General appearance, rather bony than fleshy	6
Perfection	100

NOTE.—It is recommended that Judges at Fairs do not award prizes to animals falling below the following minimum standard, viz.: Cows, 70 counts; heifers, 55 counts; bulls, 50 counts.

*In judging heifers, omit Nos. 17, 18 and 21.

†The same scale of points shall be used in judging bulls, omitting Nos. 17, 18, 19 and 21, and making moderate allowance for masculinity.





THE OSBORNE COLUMBIA MOWER.

THE OSBORNE COLUMBIA MOWER is the accumulated excellence of an experience of forty-two years.

A MACHINE PERFECT IN DETAIL, neat in design, light in draft, easy for the driver to operate, and embodying every element of durability. We place it on the market as a grass-cutting machine without an equal.

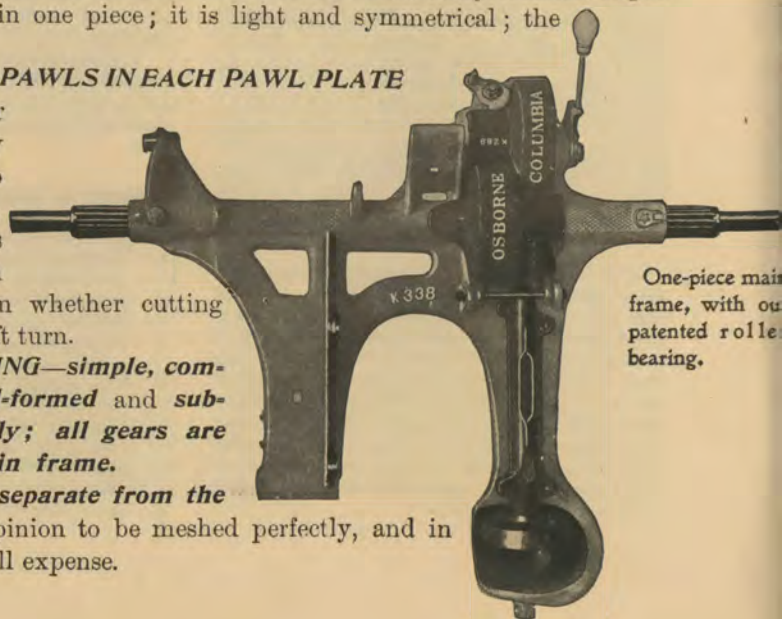
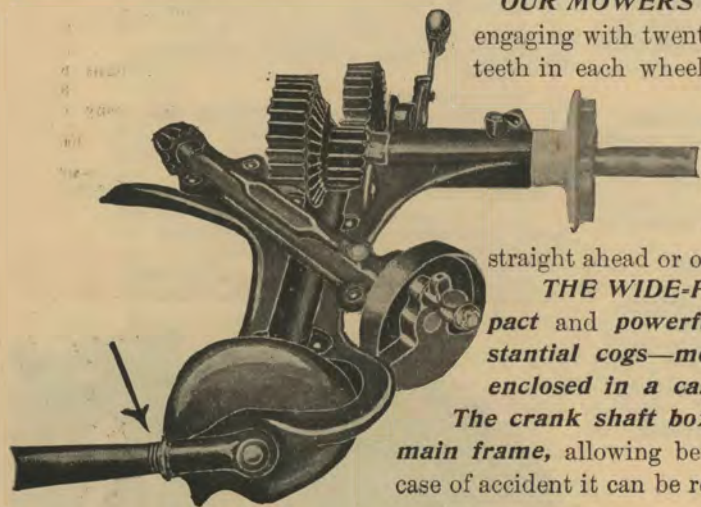
No building can stand without a solid foundation, and a machine of any kind is worthless without a substantial framing. In the main frame of the Columbia every element is present that can possibly add to its value; it is cast in one piece; it is light and symmetrical; the hardest work of the harvest will not warp or break it.

OUR MOWERS HAVE FOUR PAWLS IN EACH PAWL PLATE

engaging with twenty-nine annular teeth in each wheel, consequently there can be no lost motion, and the knives are kept in constant action whether cutting straight ahead or on a right or left turn.

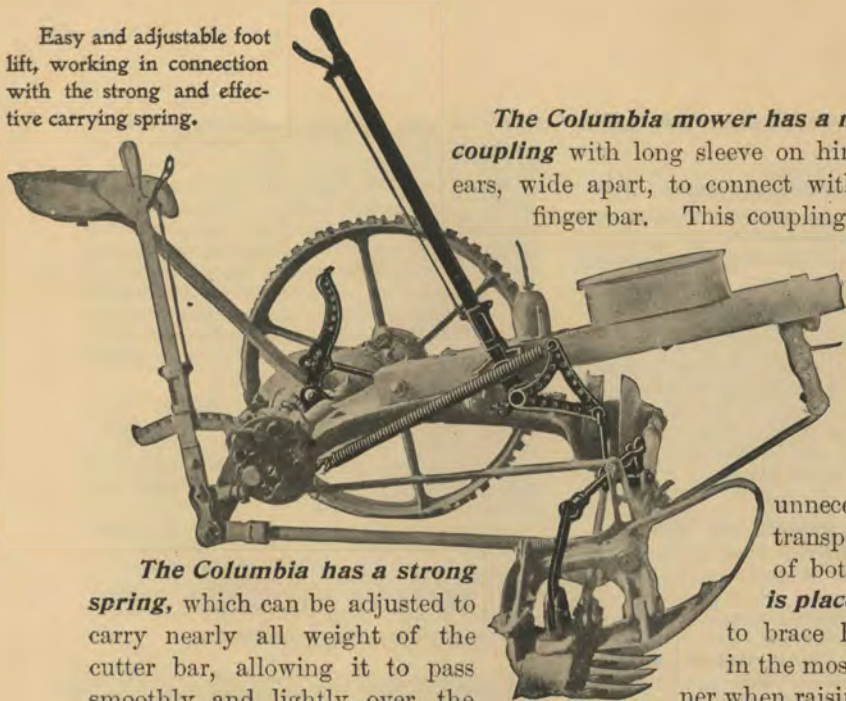
THE WIDE-FACED GEARING—simple, compact and powerful, with well-formed and substantial cogs—meshes perfectly; all gears are enclosed in a case in the main frame.

The crank shaft box is entirely separate from the main frame, allowing bevel gear and pinion to be meshed perfectly, and in case of accident it can be replaced at small expense.



One-piece main frame, with our patented roller bearing.

Easy and adjustable foot lift, working in connection with the strong and effective carrying spring.



The Columbia has a strong spring, which can be adjusted to carry nearly all weight of the cutter bar, allowing it to pass smoothly and lightly over the ground, throwing most of the weight on the main wheels, making the machine of lighter draft and increasing the cutting power.

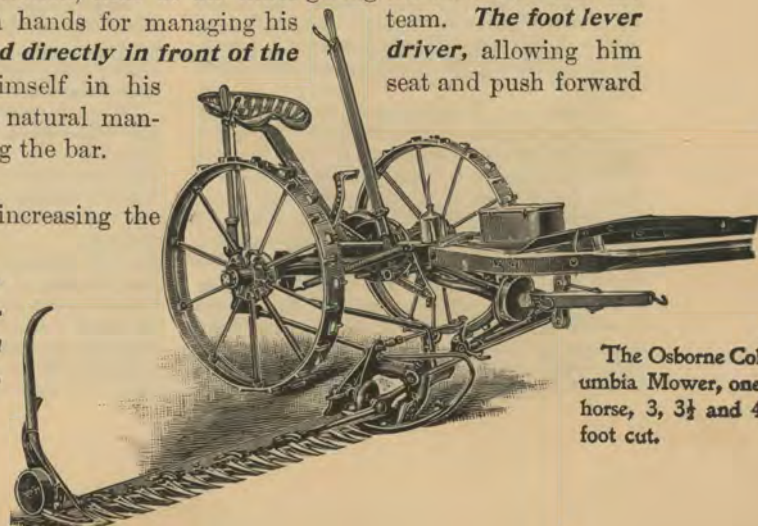
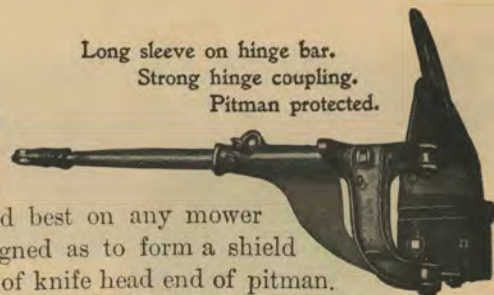
The Osborne Columbia Mower has a perfect draft attachment, carries the whiffletrees under the pole, and has absolutely no weight on the horses' necks. The whiffletrees can be raised or lowered to draw more or less from the hinge bar.

The Columbia mower has a malleable iron hinge coupling with long sleeve on hinge bar, and double ears, wide apart, to connect with malleable shoe on finger bar. This coupling is the strongest and best on any mower built.

It is so designed as to form a shield under and in front of knife head end of pitman. Compare this connection with the cheap cast-iron hinge and shoe, also with the light connections and single pin used on other mowers.

THIS MOWER HAS A PERFECT FOOT LIFT, the only one which can be adjusted to the length of the driver's leg. It lifts the bar extremely high, making it unnecessary to use the hand lever save when folding bar for transportation, thus at all times giving the driver the free use of both hands for managing his team. **The foot lever is placed directly in front of the driver,** allowing him to brace himself in his seat and push forward in the most natural manner when raising the bar.

Long sleeve on hinge bar.
Strong hinge coupling.
Pitman protected.



The Osborne Columbia Mower, one-horse, 3, 3½ and 4-foot cut.



Harvesting Apples.

The time to pick is when the apples have colored up to show well. The best plan is to make two pickings from each tree. That is, pick all that have colored enough to insure their ripening up properly

and only show the least sign of shriveling, as at that stage they keep the best. Some soils or situations will ripen up trees ahead of others; look out and pick these first. In ten to fifteen days all that have been left will ripen and redden so you would hardly know your own orchard. They will grow enough in this time to pay for all the extra work, and the last picking will give the most solid and best keepers.

To take care of the apples as they are picked through the hot days of autumn till put into winter quarters or market two ways are practiced. The first is to haul the apples in barrels into the barn or other house, where the sun is completely shut out, but so arranged that the air will circulate freely. Pour them out on the floor not more than four feet deep and they keep that way very well till winter. The other way is to pack the apples into barrels as they are picked. Put in no rotten or specked ones; fill the barrels as full as you can, put in the heads well without using the press. Haul in and store in a barn or apple house constructed without floor, on rolling ground, where it will never get wet. Permit free

circulation through it but no sun. Such a barn gives entire satisfaction.

The Farm-home Lawn.

There are but few things which, at small expense, add so much to the appearance of a farm-home as a well-kept lawn. In order that it may aid materially in beautifying the place, it is not necessary that the lawn be either large in area or elaborate in design. It may be very small and very simple, yet if it is kept clean and the grass short and even, it will greatly add to the attractiveness of the home to which it belongs. Such a lawn almost any farmer can have simply by taking care of it. The beauty of the lawn itself, to say nothing of the improved appearance of the farm, will pay most liberally for the little time and labor required to keep it in good condition.

Dried Corn Fodder vs. Silage.

Bulletin 122 of the New Jersey Experiment Station contains a detailed account of a carefully conducted experiment carried on to determine whether or not it is more profitable to make fodder corn into silage than to dry cure it in the field.

The corn yielded 11.25 tons of green forage, or 4.1 tons of cured forage per acre. That of which silage was made was cut into three-quarter inch lengths and put in the silo. The other was shocked in the field and hauled to the barn in October and cut as needed to feed, into the same lengths as the silage. It was found that it cost 6.3 per cent more to prepare the silage for feeding than it did the field cured fodder. This difference was mainly on account of the extra cost of hauling the green fodder. The experiment was made with milch cows. The grain ration fed with each was a good and ample one, and the same in both cases. They were fed an equal amount of dry matter with both silage and dry fodder. The silage

they ate up clean, but left some of the dry fodder. It was found that the losses in dry matter were about the same in siloing as in dry curing.

The trial lasted 24 days; the cows were divided into two lots. One lot fed silage 12 days and fed dry fodder the same length of time; then they were changed about, those having silage were fed dry fodder and those first fed dry fodder were fed silage.

It was found that when fed dry fodder, the cows fell off in flow of milk much faster than when fed silage, so that the yield of milk was 12.8 per cent., and of butter fat 10.4 per cent. greater from silage, than from its equivalent in dry fodder.

This gain from feeding silage is accounted for in part, at least, by the greater digestibility of silage over dry fodder, and it was not that the silage fed cows drew on their bodies for this extra amount of milk, for when they were weighed it was found they had not changed in weight.

In summing the whole thing up, it was found that taking everything into account—the cost and proceeds—with milk at one cent a pound, or about two cents a quart, an acre of this corn, yielding 11.25 tons of green forage, brought \$10 more when siloed than a like acre dry field cured.



Farmers' Scrap Books.

Farmers' scrap books may be made very valuable by keeping extracts from agricultural papers, pamphlets and addresses. The extracts can be classified and indexed, and make practically valuable treatises on various subjects. At the same time they furnish interesting data as to the dying out of old practices and the introduction of new doctrines, out of which a pretty fair history might be constructed of the progress of farming, as the years pass and the scrap books multiply.

Resolutions for Farmers.

Get out behind the barn, roll up your sleeves, tuck your trousers into your boots, and look over your poultry house to see if it is all right, and then resolve that you won't allow things to go in a haphazard way any more.

That you won't keep a worthless dog.

That you won't go in debt.

That you will be a better farmer than ever before.

That you will live better this year than in the past.

That you will know what your family expenses are.

That you will know what each crop costs and what it brings in.

That you will be economical but not penurious.

That you will keep your tools in a dry place when not in use.

That you will plant less and cultivate more.

That you will never plant corn on ground not properly prepared, and that you will cultivate it thoroughly.

That you will prize the compost heap as the apple of your eye, and not allow it to burn its heart out or the rains to wash it away.

That you will put ashes around your apple trees.

That you will not make a cow pasture out of the orchard.

That you will eat more fruit and be healthier.

That you will not allow your hogs to drink a gruel of tadpoles and mud.

That you will not abuse your horse nor use him if his shoulders or back are sore.

Keep the Boy Ambitious.

FRANK H. SWEET.

Many of us have seen the discontented boy making a pretense of picking up stones or potatoes, or perhaps sulkily working his way across an onion or turnip field, and we know something of his value in the economy of a farm. And, on the other hand, we are all more or less acquainted with the resolute, energetic boy, whose limbs never seem to tire, and whose great ambition is to do the work of a man. One such boy, who is striving to do all he can, is worth a dozen of those who are striving to do as little as possible. And yet the two boys are primarily the same.

We coax the restive or refractory horse, and do not think time wasted in training him to usefulness; and yet some of us are unwilling to do as much for the boys who are being fitted for the higher and more intelligent work of the farm. We all like good stock, and good land, and good seed—especially the last, for that is the secret of success. But of all seeds which yield satisfaction and prosperity, there are none so sure as the judicious sowing of reading matter and games for the long winter evenings, an occasional half-holiday during the summer, when the boy's nerves are strained and overwrought by continual hard work, and social, familiar conversation at all times. Make him feel that he has a personal interest in the farm, and is not a mere dependent, and he will come out all right.

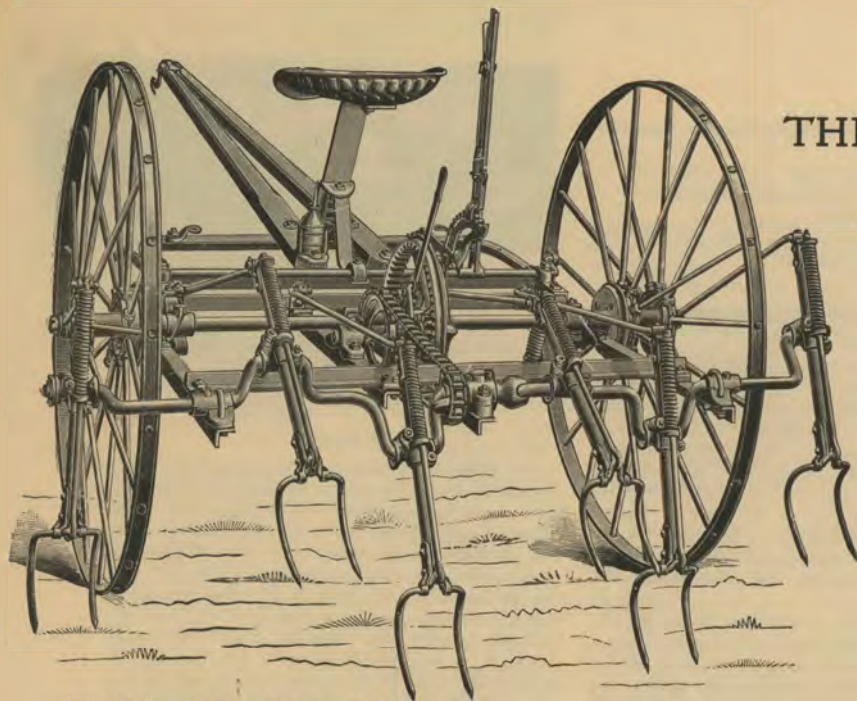


Remember that work is well done when the laborer's heart is in it, but when the heart strays the work flags.

Troughs.

An excellent trough may be made from a log. If for feed, a large log may be selected and be so split as to give about three-fifths of it for the trough. For a feed trough one can make the shell thinner than for a watering trough, and for the latter one must be more careful to select a sound piece of timber. As younger trees are more likely to be sound and more durable than old ones, it is best to select them for watering troughs. The sides may be cut down to a thickness of only two inches, after the bark and a little of the wood immediately under it is removed, but the ends should be a foot thick, and should be treated promptly with hot oil, to prevent their cracking. It will pay to paint the trough inside and out. Brown mineral paint is the cheapest and best for the purpose. For hollowing out the troughs an adze is almost essential. Don't attempt to make a watering trough of planks unless you are at least "handy with tools." It is better to bolt than to nail the planks together, using rods reaching across the trough.

It is the thing that a man does that betrays what he really is—and he is often the most surprised.



The Osborne All-steel Center Drive Hay Tedder. Light, strong and effective.

THE OSBORNE ALL-STEEL CENTER DRIVE TEDDER.

The judgment of the practical agriculturist is that the best results in curing hay are only secured with the aid of a tedder.

Several seasons' use has conclusively proven the superiority of our tedder, both at home and abroad ; it is the standard among such implements, and the hay crop is not properly gathered without it.

The grass is left by the mower in smooth, even layers and exposed to the rapid action of the sun, so that the upper side will bleach and burn, while the under side will still remain green and damp ; but the tedder tosses the hay up, leaving it open and loose, so as to permit of a free circulation of air, consequently it is cured uniformly and in one-half of the ordinary time.

A light or heavy crop is handled with the same ease, and a uniform dryness obtained.

ALL THE PARTS OF THE OSBORNE TEDDER

ARE LIGHT AND STRONG; the full power from both wheels is exerted upon the forks, for the chain drive operates direct from the center of the axle to the crank shaft. **The crank shaft is solid, and in consequence it is impossible for the forks to get out of adjustment;** this is one of the distinguishing features of this tedder. Where the crank shaft is divided, as in other similar implements, the forks are in two gangs, and when turning the machine one gang will run faster than the other ; consequently the forks are thrown out of proper alignment, their work is imperfect, patches of hay are left untended, the machine balance is destroyed and the draft is increased. These faults are all absent from the Osborne tedder.



Our forks are made of the best quality of crucible spring steel ; they are journaled upon arms of tubular steel, and can be adjusted high or low while in motion ; they are thoroughly protected from breakage, their points being back of a perpendicular line through their pivots ; their flexibility is reinforced by a strong coiled spring.

Whatever hay has been run over by the wheels is thoroughly stirred and teded by the outside forks.

All bearings are wide and easy to oil, guaranteeing to the operating parts less wear and greater power.

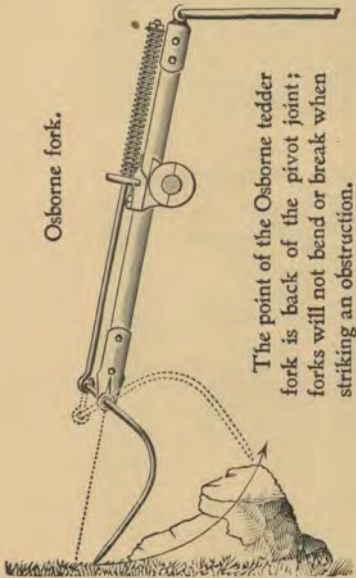
The driver's seat is adjustable and the levers are within easy reach.

Any jars to which the tedder may be subjected on rough ground are absorbed by a heavy coiled spring on the front of the frame.

Combination pole and shafts dispense with stub shafts.

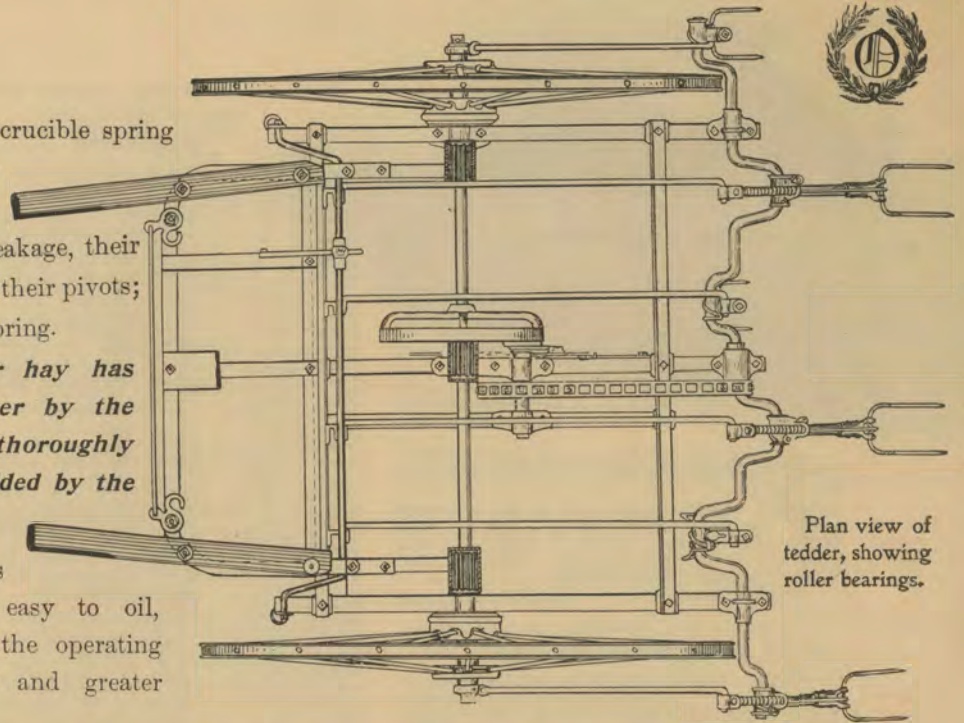
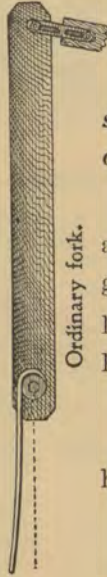
This tedder is fitted with our patented roller bearings.

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.

Ordinary fork.



Plan view of tedder, showing roller bearings.



Rates of Postage.

POSTAL CARDS, 1 cent each, go without further charge to all parts of the United States and Canada. Cards for foreign countries (within the Postal Union) 2 cents each. Postal Cards are unmailable with any writing or printing on the address side, except the direction, or with anything pasted upon or attached to them.

LOCAL, OR "DROP" LETTERS, that is, for the city or town where deposited, 2 cents where the carrier system is adopted, and 1 cent where there is no carrier system.

ALL LETTERS, to all parts of the United States, Canada and Mexico, 2 cents for each ounce or fraction thereof.

FIRST CLASS.—Letters and all other written matter, whether sealed or unsealed, and all other matter, sealed, nailed, sewed, or fastened in any manner so that it cannot be easily examined, 2 cents for each ounce or fraction thereof.

SECOND CLASS.—Only for publishers and news agents, 1 cent per pound.

Newspapers and Periodicals (regular publications) can be mailed by the public at the rate of 1 cent for each 4 ounces or fraction thereof.

THIRD CLASS.—Printed matter, in unsealed wrappers only (all matter enclosed in notched envelopes must pay letter rates), 1 cent for each 2 ounces or fraction thereof, which must be fully prepaid. This includes books, circulars, chromos, engravings, handbills, lithographs, music, pamphlets, proof-sheets and manuscript accompanying the same, reproductions by the electric pen, hectograph, metallograph, papyrograph, and, in short, any reproduction upon paper, by any process except handwriting, the copying press, typewriter and the neostyle process. Limit of weight 4 lbs., except for a single book, which may weigh more.

FOURTH CLASS.—All mailable matter not included in three preceding classes, which is so prepared for mailing as to be easily withdrawn from the wrapper and examined, 1 cent per ounce or fraction thereof. Limit of weight, 4 lbs. Full prepayment compulsory.

Population of the Largest Cities in the United States.

CENSUS 1890.

New York, N. Y.	1,513,501	Lincoln, Neb.	55,491
Chicago, Ill.	1,098,576	Charleston, S. C.	54,592
Philadelphia, Pa.	1,046,252	Hartford, Ct.	53,182
Brooklyn, N. Y.	804,377	St. Joseph, Mo.	52,811
St. Louis, Mo.	460,357	Evansville, Ind.	50,674
Boston, Mass.	446,507	Los Angeles, Cal.	50,394
Baltimore, Md.	433,547	Des Moines, Ia.	50,067
San Francisco, Cal.	297,990	Bridgeport, Ct.	48,856
Cincinnati, O.	296,309	Oakland, Cal.	48,540
Cleveland, O.	261,546	Portland, Ore.	47,294
Buffalo, N. Y.	254,457	Saginaw, Mich.	46,215
New Orleans, La.	241,995	Salt Lake City	45,205
Pittsburg, Pa.	238,473	Lawrence, Mass.	44,559
Washington, D. C.	229,296	Springfield, Mass.	44,164
Detroit, Mich.	205,669	Utica, N. Y.	44,001
Milwaukee, Wis.	204,150	Manchester, N. H.	43,983
Newark, N. J.	181,515	Seattle, Wash.	43,914
Minneapolis, Minn.	164,738	Hoboken, N. J.	43,561
Jersey City, N. J.	163,987	Savannah, Ga.	41,762
Louisville, Ky.	161,005	Peoria, Ill.	40,758
Omaha, Neb.	139,526	N. Bedford, Mass.	40,705
Rochester, N. Y.	138,327	Harrisburg, Pa.	40,164
St. Paul, Minn.	133,156	Somerville, Mass.	40,117
Kansas City, Mo.	132,416	Erie, Pa.	39,699
Providence, R. I.	122,043	San Antonio, Tex.	38,681
Indianapolis, Ind.	107,445	Kansas City, Kan.	38,271
Denver, Col.	106,670	Dallas, Tex.	38,140
Allegheny, Pa.	104,967	Sioux City, Iowa	37,862
Albany, N. Y.	94,640	Elizabeth, N. J.	37,670
Columbus, O.	90,398	Wilkesbarre, Pa.	37,651
Syracuse, N. Y.	87,877	Portland, Me.	36,608
New Haven, Ct.	85,981	Holyoke, Mass.	35,528
Worcester, Mass.	84,536	Fort Wayne, Ind.	35,349
Seranton, Pa.	83,450	Binghamton, N. Y.	35,093
Toledo, O.	82,652	Wheeling, W. Va.	35,052
Richmond, Va.	80,838	Norfolk, Va.	34,986
Paterson, N. J.	78,358	Youngstown, O.	33,199
Lowell, Mass.	77,605	Augusta, Me.	33,152
Nashville, Tenn.	76,309	Duluth, Minn.	32,725
Fall River, Mass.	74,351	Springfield, O.	32,135
Cambridge, Mass.	69,837	Yonkers, N. Y.	31,942
Atlanta, Ga.	65,515	Mobile, Ala.	31,822
Memphis, Tenn.	64,586	Topeka, Kan.	31,802
Grand Rapids	64,147	Quincy, Ill.	31,478
Wilmington, D.	61,437	Salem, Mass.	30,735
Troy, N. Y.	60,699	Long Island City	30,396
Reading, Pa.	58,926	Altoona, Pa.	30,269
Dayton, O.	58,868	Dubuque, Ia.	30,147
Trenton, N. J.	58,488	Galveston, Tex.	29,118
Camden, N. J.	58,274	Chattanooga, T.	29,109
Lynn, Mass.	55,684	Pueblo	28,128

Elmira, N. Y.	28,070	Little Rock, Ark.	22,496
Chelsea, Mass.	27,850	Knoxville, Tenn.	22,447
Bay City, Mich.	27,836	Lexington, Ky.	22,355
Akron, O.	27,702	Bloomington, Ill.	22,242
Pawtucket, R. I.	27,502	Springfield, Mo.	21,842
Houston, Tex.	27,411	Oswego, N. Y.	21,826
Joliet, Ill.	27,407	Montgomery, Ala.	21,790
Haverhill, Mass.	27,322	South Bend, Ind.	21,786
Brockton, Mass.	27,278	Spok. Falls, Wash.	21,786
Canton, O.	26,327	Council Bluffs, Ia.	21,388
Birmingham, Ala.	26,241	Meriden, Conn.	21,230
Auburn, N. Y.	25,887	Zanesville, O.	21,117
Rockford, Ill.	25,589	Racine, Wis.	21,022
Taunton, Mass.	25,389	N. Albany, Ind.	21,008
Allentown, Pa.	25,183	York, Pa.	20,849
Davenport, Ia.	25,161	Woonsocket, R. I.	20,759
Springfield, Ill.	24,852	McKeesport, Pa.	20,711
Newton, Mass.	24,357	Chester, Pa.	20,167
Wichita, Kan.	23,735	Lynchburg, Va.	19,779
Petersburg, Pa.	23,317	Newport, R. I.	19,449
Newburg, N. Y.	23,263	Danbury, Conn.	19,385
Malden, Mass.	22,984	Athol, Conn.	15,500
Poughkeepsie, N. Y.	22,836	E. St. Louis, Ill.	15,156
Macon, Ga.	22,698	Lebanon, Pa.	14,734
Muskegon, Mich.	22,668	Keokuk, Ia.	14,075

Population of the United States.

Alabama	1,513,017	Nebraska	1,058,910
Arizona	59,620	Nevada	45,761
Arkansas	1,128,179	New Hampshire	376,530
California	1,208,130	New Jersey	1,444,933
Colorado	412,198	New Mexico	153,563
Connecticut	746,258	New York	5,997,853
Delaware	168,493	North Carolina	1,617,947
Dist. of Columbia	230,392	North Dakota	182,719
Florida	391,422	Ohio	3,672,316
Georgia	1,897,353	Oklahoma	61,834
Idaho	84,385	Oregon	313,767
Illinois	3,826,351	Pennsylvania	5,258,014
Indiana	2,192,404	Rhode Island	345,506
Iowa	1,911,896	South Carolina	1,151,149
Kansas	1,427,096	South Dakota	328,808
Kentucky	1,858,635	Tennessee	1,767,518
Louisiana	1,118,587	Texas	2,235,523
Maine	661,086	Utah	207,905
Maryland	1,042,390	Vermont	332,422
Massachusetts	2,238,943	Virginia	1,655,980
Michigan	2,093,889	Washington	349,390
Minnesota	1,301,826	West Virginia	762,794
Mississippi	1,289,600	Wisconsin	1,686,880
Missouri	2,679,184	Wyoming	60,705
Montana	132,159		
Total			62,622,250

Stone-work.

Stone walls are measured by the perch ($24\frac{1}{4}$ cubic feet). Openings less than 3 feet wide are counted solid; over three feet deducted, but 18 inches are added to the running measure for each jamb built. Arches are counted solid from their spring. Corners of buildings are measured twice. Pillars less than 3 feet are counted on 3 sides as lineal, multiplied by fourth side and depth.

It is customary to measure all foundation and dimension stone by the cubic foot. Water tables and base courses by lineal feet. All sills and lintels or ashlar, by superficial feet, and no wall less than 18 inches thick.

The greatest safe load per superficial foot on

Granite piers	40 tons,
Limestone piers	25 "
Sandstone piers	15 "
Brickwork in cement	3 "
Rubble masonry	2 "
Lime concrete foundations	$2\frac{1}{2}$ "

The height of brick or stone piers should not exceed 12 times their least thickness at base.

Concrete Walls.

Concrete walls for houses are built of 1 of cement to 6 or 7 of broken stone, shingle, gravel or slag. The substance mixed with the cement must be free from loam, fine sand, clay or dirt of any kind.

To prevent the cement from adhering to the planks of the mold, apply freely to them with a brush, soap boiled to the consistency of paint.

Fruit for the Family.

No matter how far from market a farmer may be, he can grow a patch of strawberries and be sure of a market at home. It is astonishing how much fruit

of all kinds can be eaten by a small family when the supply is unstinted. There are few neighborhoods where those who begin by growing a supply of strawberries for home use will not find a market springing around them from neighbors, who keep on in the old ruts because they think they haven't time to attend to such small affairs as the culture of berries. They are small in size, but more bushels of strawberries can be grown per acre than any kind of grain, and the fruit may be sold cheap and yet bring more than grain profits.

Beautify the Farm Home.

Always keep in mind that a farm is a home; that everything done toward beautifying and improving it adds directly to its value. Lose no time in loafing, but put in all the time to be spared from routine work in making the thousand little improvements always needing to be done. We once heard a farmer—a cripple at that—congratulated on his beautiful home and grounds. "Why, it couldn't have cost less than \$40,000," said the speaker. "Forty thousand fiddlesticks!" was the reply. "It didn't cost \$200 all told. My boys and I did all there was to do, except buy some lumber and paint, at odd times, in ten years. My wife laid out the lawn, trained the vines, etc. There's nothing there but the same old house, covered with paint and creepers, new shrubbery, young trees, gravel drives, walks, etc." Yet the place did look as though a large sum of money had been expended on it.

Good tools are a requisite to successful farming, and a good education furnishes the mental tool to enable one to use the physical with wisdom.

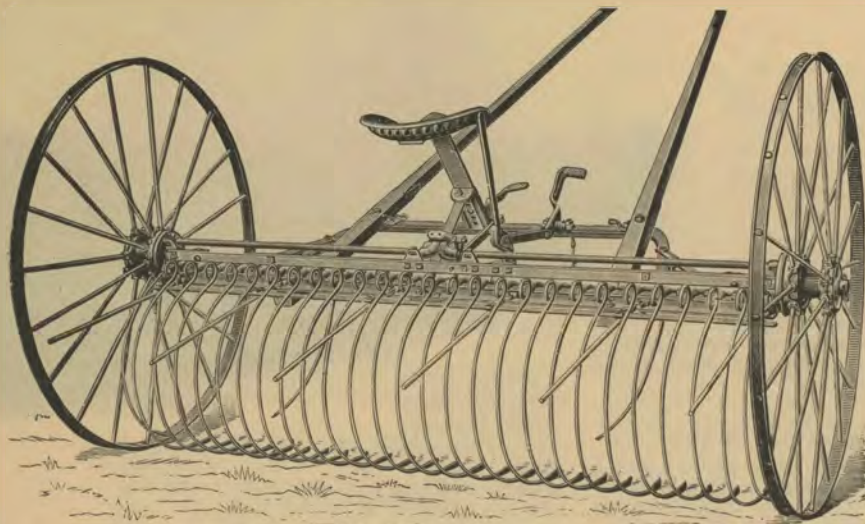


When a cow is two years old, a wrinkle begins to form at the base of her horns. At three years this wrinkle is fully developed. When she is five years old another will form, and after that one will come each year. Thus her age can be known.

Try to have products to sell in the season when they are the highest.

Clear the Fence Rows.

Many farms have belts of young trees and bushes from ten to fifteen feet wide along the road and line fences. They form a thicket which encroaches yearly upon the fields they border. It seems strange that any farmer should allow such a condition of things to exist, but many do from sheer carelessness. Sometimes they mean to cut the bushes, but the work is put off from time to time because other work seems more important. Such thickets about fields form lurking places for animals and foul weeds, from which much damage can be expected to growing crops, to say nothing of the amount of soil given up to them. There is not only great wastefulness in such farming, but it gives a farm an untidy, slovenly look which ought to be avoided.



THE OSBORNE SELF-DUMP HAY RAKE.

Its popularity among agriculturists and its enormous sales are convincing arguments as to the thorough superiority of this perfect implement—popularity won by its unexcelled performance in the field everywhere—the natural result being sales so great as to tax the capacity of our factories.

The wheels are distinctive and their like is to be found on no other rake; THEY ARE INTER-

CHANGEABLE and constructed on **SUSPENSION PRINCIPLES** that guarantee indestructibility; they have double hubs and the spokes (twenty in number) are larger at the ends, to give the greatest strength against the greatest strain.

Every part of this rake is constructed and arranged in the most thorough mechanical and efficient manner.

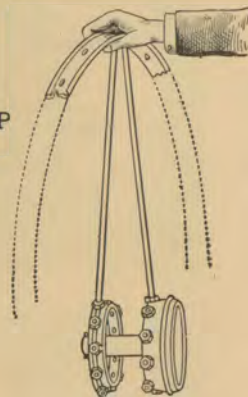
The rake head is high, giving large holding capacity, and is made of high-grade angle steel bar; the main frame is formed of similar material, forged into shape. **None but the best of steel and iron are used.**



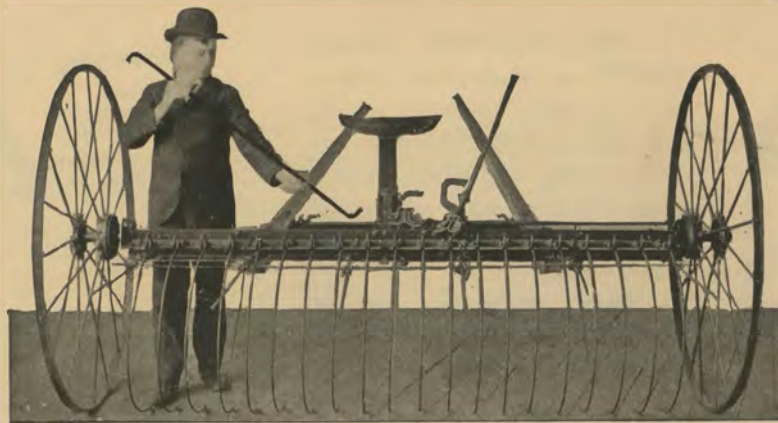
THE OSBORNE SELF-DUMP
RAKE IS MADE IN THE
FOLLOWING SIZES:

- 8-foot, with 20 teeth.
- 8-foot, with 25 teeth.
- 10-foot, with 24 teeth.
- 10-foot, with 30 teeth.
- 12-foot, with 28 teeth.
- 12-foot, with 35 teeth.

Section of the single hub
wheel used on other rakes;
12 to 16 spokes.



Section of the Osborne
double hub bicycle
wheel; 20 spokes.



Reversible dump rods—give double wear.

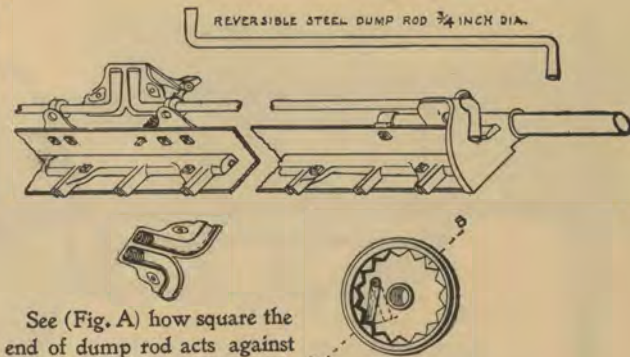
SELF-DUMP DEVICE.

A slight pressure upon the foot lever is sufficient to throw into immediate action the self-dumping device. This self-dumping mechanism has, in an eminent degree, the principles that distinguish all the Osborne machines—accuracy, simplicity and reliability. The dump rods engage instantly with the teeth in the wheel hubs, and are held in such position until the rake head is raised to its highest point and the hay is dropped. **These rods are interchangeable and add to the long life of this remarkable rake.**

The action of the rake is always accurate, either when turning or raking straight ahead. No hay is left ungathered, for the teeth drop to the very edge of the wind-row; the rapidity of the drop can be regulated to suit a fast or slow walking horse.

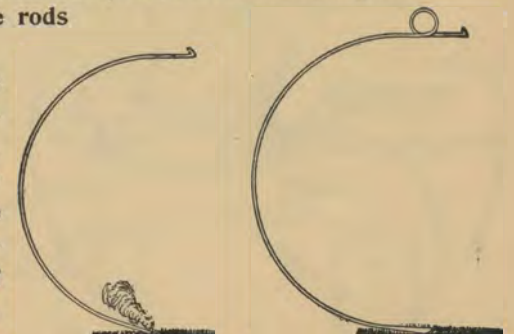
THE TEETH ARE ALL EXACTLY ALIKE AND ARE MADE OF OIL-TEMPERED HIGH-CARBON STEEL; the flattened oval points glide over the ground and do not dig into it, to stir up dust to spoil the hay and make it unpalatable to stock. **The teeth are secured** to the steel angle bar rake head **by strong clamps**, and they can be detached and replaced; a single coil adds to their elasticity, preventing breakage when encountering an obstacle.

The spacing of the teeth can be changed, if desired, by changing the clamps.



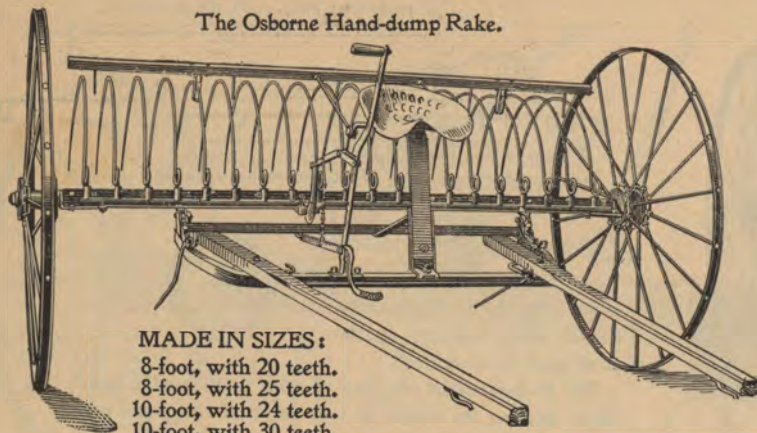
See (Fig. A) how square the end of dump rod acts against pawl plate in wheel hub.

Fig. B shows that the face of each tooth has the same angle, making the wheel, as well as the dump rods, perfectly interchangeable.



Ordinary rake tooth scratches hay full of dust, injuring stock.

Osborne flattened point tooth glides smoothly over the ground. It rakes hay without dust.

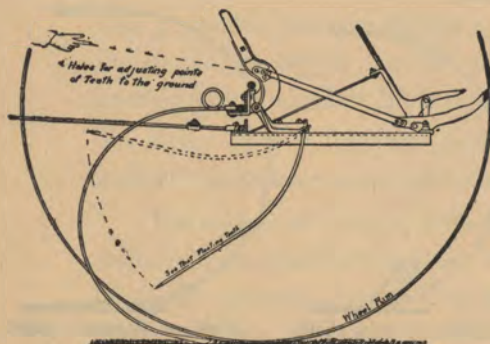


The Osborne Hand-dump Rake.

MADE IN SIZES:
8-foot, with 20 teeth.
8-foot, with 25 teeth.
10-foot, with 24 teeth.
10-foot, with 30 teeth.

An implement that is built for long and satisfactory service.

IT IS OFTEN DESIRABLE TO CHANGE THE RAKING POSITION OF THE TEETH on account of the condition of the field; for while the teeth are operated in a normal position in a dry meadow, they must be raised to give the best of work where the ground is wet or boggy. This change of the position of the teeth, to rake high or low, is quickly done, as shown in the cut.

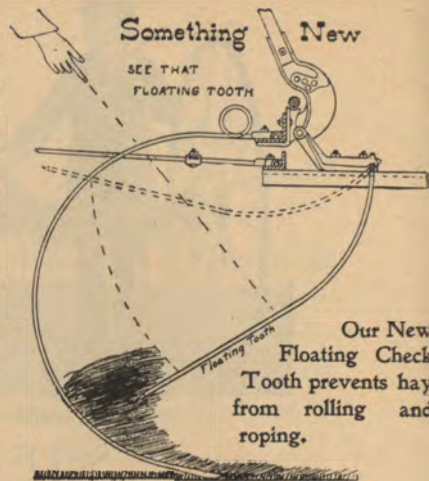


Quick adjustment for changing the raking position of the teeth. Four holes.

THE FLOATING CHECK TEETH were designed and placed upon our rakes last season for the first time. They instantly met with popular approval, for they filled a long felt want, and proved a perfect remedy for an evil much complained of.

They absolutely prevent the hay from rolling, roping in the wheel, or spilling out at the ends, when raking scatterings or a thin crop.

They are self-clearing and no rake is perfect without them.

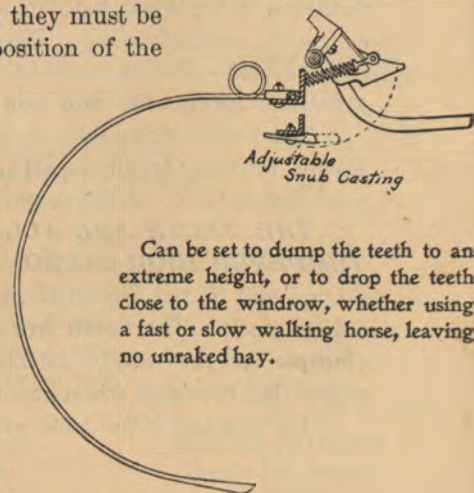


The height of the dump, for heavy or light hay, is regulated by the adjustment of the snub casting, as shown in the illustration.

The spring seat can be raised or lowered, or moved forward or back, to suit the driver.



Our patent whiffletree helps the horse to turn the rake.



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 unranked hay.

Shelves for Books.

Shelves and cases for books are always useful and these may be made at home by women who are handy with tools and paint brush. Where space is limited, hanging shelves recommend themselves. A set of corner shelves, the subject of an illustrated description in *The Woman's Home Companion*, is here suggested as a good model. It will not be a difficult matter to duplicate this, if due attention is paid to the directions here reproduced from the journal in question:

Good boxes of various sizes can be found at the grocery store. The nest of corner shelves is formed with two boxes fitted with shelves. To fasten the shelves screws should be driven into the ends of them through the side boards of the boxes. Flat headed screws 2 inches long may be used for this purpose, so that when the woodwork is painted the means of fastening will be invisible. New sides can be added to them, the lower ends of which are cut in the form of brackets. The cornice molding is mitered around the top, and the woodwork painted.

To finish the woodwork well, give it several successive thin coats of "inside" paint of some desir-



Corner Shelves for Books.

able color to match the woodwork in the room in which it may be placed. After the first coat is applied and is thoroughly dry, the surface should be sandpapered, to take off the rough places and give it a smooth finish preparatory to the second coat. Three coats will be quite sufficient for the average wooden box, as they will hide all unsightly places that may have appeared on the unpainted surfaces.

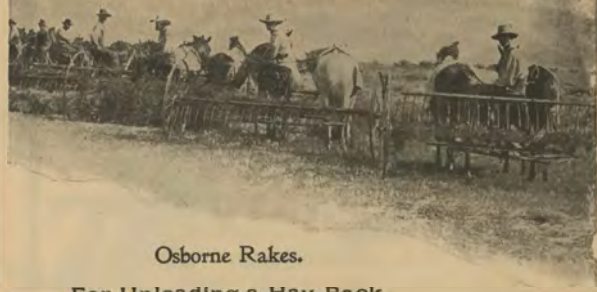
Such a nook can be made to accommodate many books and odd pieces of bric-a-brac, as well as some cups and small pitchers. The addition of curtains on rods will improve the general appearance, and such a nook should be a very useful affair in a library, sitting room or bedroom.

Small Pastures.

Two or three small pastures are better than one large one. The cattle may be turned out a week earlier, and when one field is well eaten down, they can be turned into another. They can always have fresh grass if changed every week or two. The pasture will last longer and the cattle be better for frequent changing. Too many fences are not desirable, but a four or five-strand barb-wire fence may be built cheaply, or a movable fence used, and changed as wanted.

Cheap Irrigation.

Take emptied fruit cans, place the open end on a hot stove a short time to remove the top, punch about four small holes through the bottom, set them half their depth in the ground, and plant your seed around them. Fill with water or liquid manure as often as need be. Cucumbers and the like will take a quart can full every day it does not rain. No baking of surface, no weed seed, and speed in watering are some of the advantages.



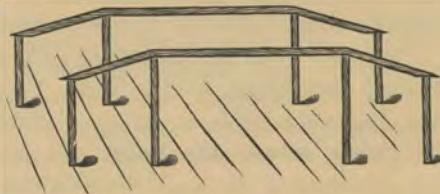
Osborne Rakes.

For Unloading a Hay Rack.

B. R. BICHENOR, MINNESOTA.

Set eight posts in two rows, four on each side, far enough apart to just let a wagon pass through. On each side have the two center ones as far from each other as the rack is long and the end post eight feet from each of these, placing poles on the middle posts sufficiently strong to hold a rack. From the end post to the middle ones also put on poles. The end posts must be just high enough to allow the ends of the rack to pass over them, when the wagon is driven between the posts. Now, fasten a chain to the axle of the wagon and to one of the cross-pieces of the rack. Start the team and the poles will raise the rack off of the sticks onto the posts without any lifting. Small blocks on the lower side of the rack beams will prevent the rack from sliding out of place.

To load the rack, drive the wagon underneath and fasten a chain to the front end of the rack and to the axle. Start the team and the rack will be drawn forward and down onto the wagon. By this means, a heavy rack can be handled without any lifting at all.



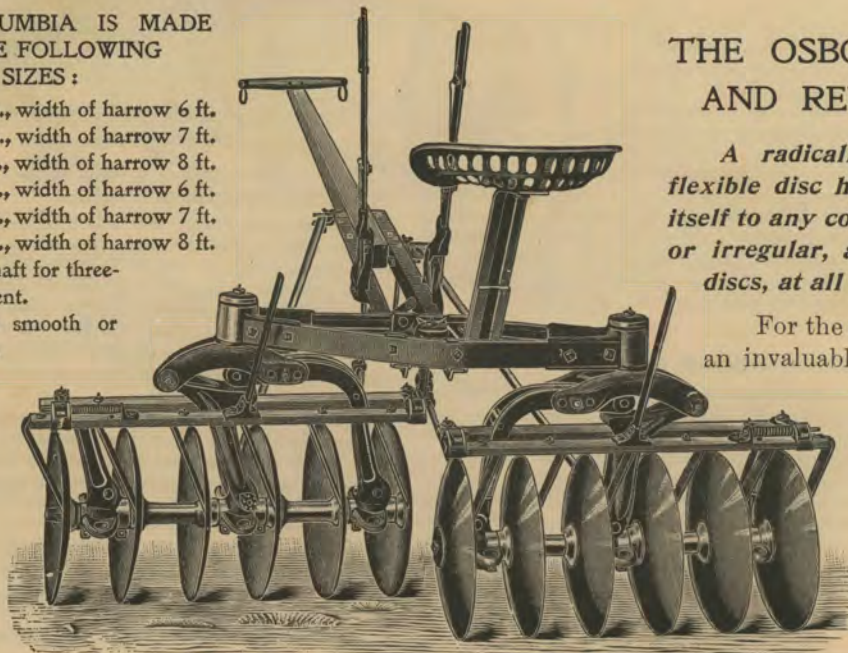
Supports for Hay Rack.

THE COLUMBIA IS MADE
IN THE FOLLOWING
SIZES :

12 discs 16-in., width of harrow 6 ft.
14 discs 16-in., width of harrow 7 ft.
16 discs 16-in., width of harrow 8 ft.
12 discs 20-in., width of harrow 6 ft.
14 discs 20-in., width of harrow 7 ft.
16 discs 20-in., width of harrow 8 ft.

With pole shaft for three-
horse attachment.

Fitted with smooth or
cutaway discs.



plowed sod is soon made as soft and mellow as the oldest cultivated field.

If either gang strikes a stone or obstruction it will rise and pass over it without injuring the edges of the discs, interfering with the work of the other gang, or throwing extra strain on any part of the frame.

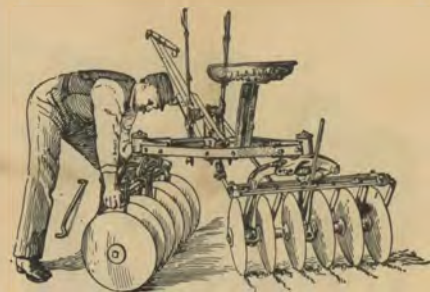
There is no side draft, for whether working as an outthrow or an inthrow, and regardless of the angle of the gangs, the draft is always from the center.

THE OSBORNE COLUMBIA FLEXIBLE
AND REVERSIBLE DISC HARROW.

A radically new harrow. The only perfectly flexible disc harrow ever constructed. It will adapt itself to any condition of the ground, whether smooth or irregular, and cut to an even depth with all the discs, at all times.

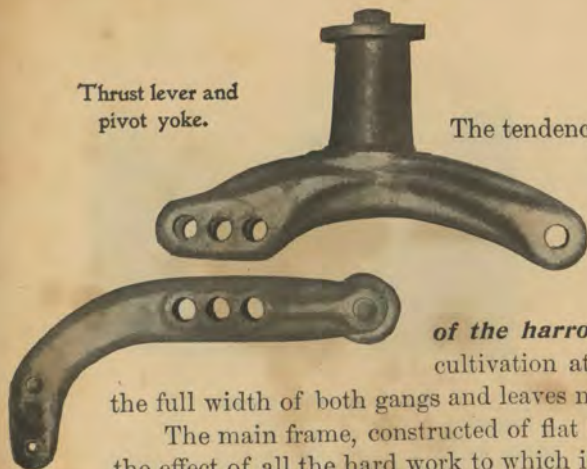
For the modern system of shallow cultivation it is an invaluable implement, for it leaves the ground in a fully pulverized state, ready for the seed.

The gangs are completely independent of each other; they are flexible and reversible in the fullest sense; fresh



The gangs are reversible.

Thrust lever and
pivot yoke.



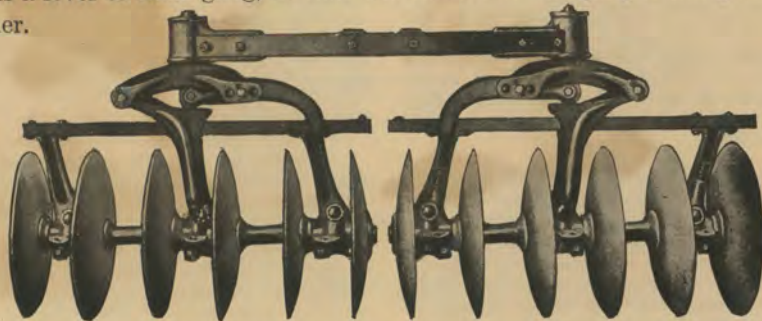
The tendency of either ends of the gangs to rise is counteracted by the rocking arms, *so that the force of the end thrust is utilized to increase the flexibility*

of the harrow, and to cause an even depth of cultivation at both ends of the gangs. This harrow cuts the soil

the full width of both gangs and leaves no center ridge of hard or unpulverized ground.

The main frame, constructed of flat heavy steel bars and castings, is fully able to withstand the effect of all the hard work to which it can possibly be subjected.

The gang frames are carried high above the gangs, so that they will not catch trash or stalks. The journals are easy to oil, and are fully protected from dirt. The long, easy levers can be readily moved while the harrow is at work. There is a lever to each gang, so that the control of one gang is independent of the other.



High frame; will not catch stalks or trash.



A strong main frame.



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.



Fattening Poultry.

Two weeks is sufficient time in which to fatten fowls for the market. But this demands conformity to certain conditions. The fowls should not have full liberty. At this time it is not economy to give them opportunity for exercise. It is desirable that all the food taken should be used to make fat, not for strength of muscle. From eight to twelve may be shut in a small room together, where there will be nothing to disturb them. If the room should be partially darkened, all the better. Let the birds have complete repose; let all their powers work toward digestion. The quickly fatted fowl is tenderest and most juicy. If no suitable room is available, a large coop may be constructed, with feeding troughs outside.

It is important that the feed should be clean, sweet and abundant. For this reason it should not be placed so that they will run over it or defile it. The object is to have the birds cram themselves, sit down quietly and digest, then cram again and so on to the end of the chapter. Now, if they are confined in a coop having a tight bottom the place will soon become intolerably filthy. There should be openings or wide spaces in the floor, that it may be cleaned often, then covered with sawdust or some other suitable litter. Kept in this condition, the fowls will 'ake four square meals in a day.



If there should be a quarrelsome one in the lot, it should be separated from the rest. Such a fowl will prevent the others from eating to the full, and disturb the quiet which is necessary to the rapid digestion of the food. Fighting tends to leanness. Even scolding will use up food and prevent an oily, rotund condition.

There is no better food for fattening purposes the world over than sweet, finely ground cornmeal wet up with skimmed milk. The mixture need not be so dry as when meal is mixed with water. There is no danger that fowls will get waterlogged on milk. Some poulterers feed buckwheat meal, thinking that it renders the poultry better in flavor. There is no objection to mixing one-third buckwheat meal with the cornmeal, as a change. The mixture should be seasoned with a teaspoonful of salt each day. Fowls that have dough for their rations will not require much water, yet fresh pure water should be supplied, that they may drink when they thirst.

A Good Idea.

A little ingenuity will often take the place of time and money in the poultry yard, even as in other places. A cute device used to keep young chicks out of their drinking water is simply a board just enough smaller than the drinking vessel to enable it to float on the water. In the board may be bored a good number of auger holes, through which the baby chicks may drink.

Poultry is nutritious and easily digested, and for these reasons the farmer who grows it should reserve a good supply for his own table. He can afford the best as well as anybody. If he goes wholly on the principle of saving by confining his meat diet to salt pork, it is ten to one that he loses more through inactivity of his mind because of this indigestible diet, than he saves by its decreased cost.



To Preserve Eggs.

Place four pounds of unslacked lime, one pound of salt and one ounce of cream tartar in an earthen jar, then add three gallons of boiling water, stir well and let the mixture stand for two days. Collect the eggs fresh each day, carefully examine them to see that they are free from cracks, lower them with care into the liquid, and put them in a cool place where they will not be disturbed. The liquid should stand above the eggs to a depth of two inches. Look at them from time to time to see if the water has not evaporated. If it has, add a little cold water. One who has tried it says that eggs will keep perfectly good for twelve months when put up in this way.

A Great Convenience.

A low-wheeled wagon is a great convenience on the farm. As the wheels are usually the first part of the running gear to play out, one can often buy a fairly good gear for little money. Then, by investing in a set of metal wheels with 3-inch tires, one can have a cheap and serviceable wagon which, when used together with common narrow-tire wagons in hauling manure or grain across the fields, will show quite an advantage in draft and the less injury done the land.

Business Law in Daily Use.

The following compilation of business law contains the essence of a large amount of legal verbiage:

If a note is lost or stolen, it does not release the maker; he must pay it, if the consideration for which it was given and the amount can be proven.

Notes bear interest only when so stated.

Each individual in a partnership is responsible for the whole amount of the debts of the firm, except in cases of special partnership.

Ignorance of the law excuses no one.

The law compels no one to do impossibilities.

An agreement without consideration is void.

A note made on Sunday is void.

Contracts made on Sunday cannot be enforced.

A note by a minor is void.

A contract made with a minor is void.

A contract made with a lunatic is void.

A note obtained by fraud, or from a person in a state of intoxication, cannot be collected.

It is a fraud to conceal a fraud.

Signatures made with a lead pencil are good in law.

A receipt for money is not always conclusive.

The acts of one partner bind all the rest.

The maker of an "accommodation" bill or note (one for which he has received no consideration, having lent his name or credit for the accommodation of the holder) is not bound to the person accommodated, but is bound to all other parties, precisely as if there was a good consideration.

No consideration is sufficient in law if it be illegal in its nature.

Checks or drafts must be presented for payment without unreasonable delay.

If the drawee of a check or draft has changed his residence, the holder must use due or reasonable diligence to find him.

If one who holds a check as payee or otherwise,

transfers it to another, he has a right to insist that the check be presented that day, or, at farthest, on the day following.

A note indorsed in blank (the name of the indorser only written) is transferable by delivery, the same as if made payable to bearer.

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 $7\frac{1}{2}$ by 4 feet. 15 plus 15 plus 12 plus 12 equals 54; 54 by 10 equals 540 feet in walls; two doors $7\frac{1}{2}$ 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.

The Hands.

Chapped hands: Ten drops carbolic acid in one ounce glycerine.

The Feet.

Chilblains: After soaking the feet for fifteen minutes in warm water, place a pair of rubbers on the feet without stockings and go to bed.

Bunions: Poultice and wear a rubber ring around the bunion under the stocking, to relieve the pressure of the shoe.

Corns: A piece of lemon or cranberry mashed and bound on the corn will remove it readily.



Osborne Mowers.

Time at Which Money Doubles at Interest.

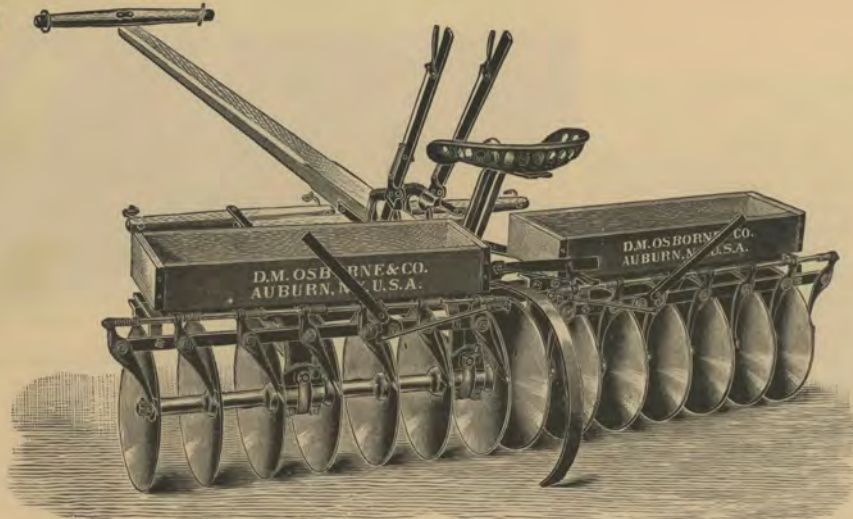
Rate Per Cent.	Simple Interest.	Compound Interest.
10	10 years	7 years, 100 days.
9	11 " 40 days	8 " 16 "
8	12½ "	9 " 2 "
7	14 " 104 days	10 " 89 "
6	16 " 8 months	11 " 327 "
5	20 "	15 " 75 "
4½	22 " 81 days	15 " 278 "
4	25 "	17 " 246 "
3½	28 " 208 days	20 " 51 "
3	33 " 4 months	23 " 164 "
2½	40 "	28 " 26 "
2	50 "	35 " 1 "

Reading good agricultural literature elevates the mind and swells the purse.

The true stockman finds pleasure and profit in being much among the animals.

Pet the young things—the colts, calves, lambs, and even the pigs; win their confidence.

Two ears of corn per day, with plenty of hay and water, and good shelter, will keep a sheep in fine condition all winter.



The Osborne Rival Disc Harrow. Light and strong.

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. |
| 10 discs, 20-inch . . . | Width of harrow, 5 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. |

THE OSBORNE RIVAL DISC HARROW.

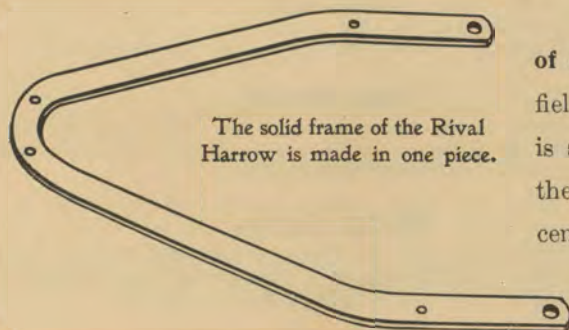
A close second to the Columbia.

The same care is exercised throughout in the selection and use of material in its construction as we employ in building the Columbia.

It is the leader in its class, and cannot be equalled for ease of handling and quality of work.

THE HARROW IS ACCURATELY BALANCED, whether the driver is on or off his seat, consequently there is no neck weight or side draft.

Its efficiency has been proven without an equal for many seasons. It has greater strength and endurance than any of its competitors, and is an implement perfect in every detail.



The solid frame of the Rival Harrow is made in one piece.

THE MAIN FRAME is one piece of solid bar steel; no kind of hard field usage can possibly affect it, and it is so attached to the disc gangs that the line of draft is direct from the center of the discs.

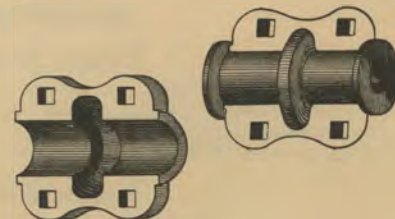
The discs are of the same quality as those used on the Columbia; the gang frames are high-grade steel and iron, and are guaranteed for strength and durability.

The levers, within easy reach of the driver, control the gangs so that they can be angled to any desired degree.

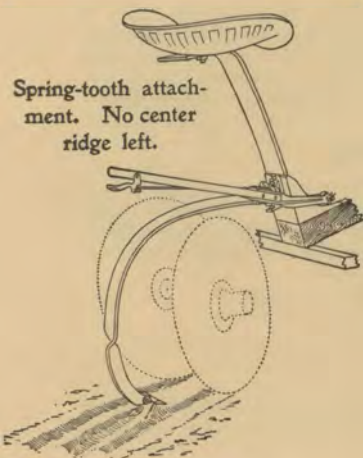
The center shovel attachment cuts out the ridge always left by harrows of this class, leaving the ground cultivated the full width of the harrow.

The shovel can be raised out of a working position, when desired; its working depth is regulated by a lever.

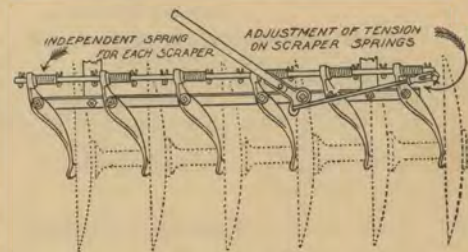
THE SCRAPERS are similar to those on the Columbia. They are governed by spring pressure, and locked either in or out of engagement with the discs.



Mechanically constructed chilled bearing; does not wear out.



Spring-tooth attachment. No center ridge left.



Osborne scraper attachment.



SOUPS.

Tomato Soup.

One quart of tomatoes, one quart of milk, one pint of water; boil water and tomatoes together twenty minutes, then add the milk and one teaspoonful of soda. Season as you would oyster soup, with butter, salt and pepper. Rub through a colander into a tureen.

Tomato Soup.

One and one-half pounds of lean beef in one gallon of water, boiled down to three pints; add one quart of tomatoes, one cup of sweet milk, two tablespoonfuls of flour rubbed into a piece of butter the size of an egg. Then boil one hour; less will do. Season with pepper and salt, and strain through a colander.

Turkey Soup.

Place the frame of a cold turkey, with the remnants of dressing and gravy, in a pot, and cover with cold water, simmer gently three hours, let it stand till the next day. Remove the fat, skim off all the bits and bones. Put the soup on to heat until it boils; then thicken slightly with flour wet with water, and season to taste.

OYSTERS AND FISH.

Cream Oysters.

Take one quart of fine large oysters; wash and drain; one pint of cream (milk will do, with more butter). Put the oysters and cream into separate kettles to heat. The oysters, when the edges curl, are to be taken from the juice in the kettle and put on a platter to keep warm; then take crackers rolled very fine and sift into the cream or milk. Add the oyster juice, season with pepper and salt to taste, and more or less butter as the richness of the cream may require. Pour the cream over the oysters and serve very hot.

Escaloped Oysters.

Put a layer of cracker crumbs in the bottom of a baking dish, then a layer of oysters; next a layer of cracker crumbs, with salt, pepper

and small pieces of butter sprinkled over, and so on until the dish is full, having cracker crumbs, with pepper, salt and butter for the top layer. Then pour over all one cup of milk, and bake forty minutes.

Fried Oysters.

Take count oysters, drain them from their liquor, and dip them first in beaten egg and then in rolled cracker, and fry in a spider or on a griddle in hot butter and lard (equal parts).

Panned Oysters.

Wash the oysters and put them in a stew pan without water. Cook them only two or three minutes. Season with butter, pepper and salt. Serve in hot oyster plates, as they must be eaten hot.

Codfish Balls.

Pick fine one quart bowl of codfish; let it simmer on the back of the stove for an hour; boil six good-sized potatoes, mash fine and mix, while hot, with the fish thoroughly; season with pepper, salt and butter; add three eggs, well beaten, and drop in hot lard. Serve in a napkin; lay the napkin on a platter, and the balls on the napkin to absorb the grease.

Codfish on Toast.

Soak a cupful of shredded codfish in cold water for an hour; let it come to a boil, drain through a colander; turn into the skillet again with a little cold milk; season with butter and pepper, stir smooth a tablespoonful of flour with a little cold milk; add, and let it boil for a moment; pour over buttered toast on a platter.

MEATS.

Beef Hash.

Chop fine cold steak or roast beef, and cook in a little water; add cream or milk, and thicken with flour; season to taste, and pour over thin slices of toast.



Beef Loaf.

Three pounds of raw beef chopped fine, one slice of pork, chopped, three soda crackers rolled fine, one egg, one-half cup of milk, one tablespoonful of melted butter, one tablespoonful of salt, one teaspoonful of pepper. Mix well together, pack into a tin and bake two hours.

Chicken Sandwiches.

Stew a chicken until very tender; season with a little salt; take out the bones and pack the meat firmly into a deep dish, mixing the white and dark nicely together; pour the broth in which the chicken is stewed over it—there should be just enough to cover the meat; when it is cold cut into smooth slices and place between slices of good bread or biscuit.

Chicken Pie.

Cut into pieces one chicken, boil in enough water to cover until tender, adding when half done one tablespoonful salt. Take out chicken, keep warm, and thicken the liquid with one tablespoonful each flour and butter rubbed together. Add salt and pepper to taste. Boil five minutes. Take one quart flour, two teaspoonfuls Cleveland's Baking Powder, a little salt and one small cup butter. Mix as biscuit. Take half, roll one-quarter inch thick, and line a deep dish, leaving an inch over the sides to turn up over top crust. Put in chicken, pour over gravy, cover with the other crust, with a large hole in center for steam to escape. Wet the edge and fold over the under crust, press firmly together. Spread soft butter over the top, make ornament to fit the center, and bake until done.

English Yorkshire Pudding.

One-half pound of flour, one pint of milk, a pinch of salt, one teaspoonful of Cleveland's Baking Powder. Mix well together the baking powder, flour and salt, then add one-half the milk, and beat until perfectly smooth; then add remainder of the milk. Melt some butter or dripping in a flat tin, pour in the batter, place a joint of beef or mutton on it, and bake in a quick oven.

Deviled Eggs.

Boil as many eggs as are desired twenty minutes, put them in the ice box until thoroughly cold, remove the shells and cut them in two around the middle. Remove the yolks and trim out the inside of the white. Mash the yolks very fine and season to taste with oil, salt, mustard and a few drops of vinegar. A little chopped parsley may be added, if desired. Fill the whites with the prepared yolks and sprinkle with pepper. Serve on lettuce leaves. The yolks that are left can be made thin with melted butter, then pour over the eggs with a teaspoon, and put them in the oven until they brown nicely.

To Poach Eggs.

Have the water well salted, and do not let it boil hard. Break the eggs separately into a saucer, and slip gently into the water; when nicely done, remove with a skimmer, trim neatly, and lay each egg upon a small, thin round of buttered toast, then sprinkle with salt and pepper. Some persons prefer them poached, rather than fried, with ham, in which case substitute the ham for toast.

Scrambled Eggs with Ham.

Put into a pan, butter, a little pepper and salt, and a little milk; when hot drop in the eggs; with a knife cut the eggs and scrape them from the bottom; add some cold ham chopped fine, and when done serve in a hot dish.

Fried Sweetbreads.

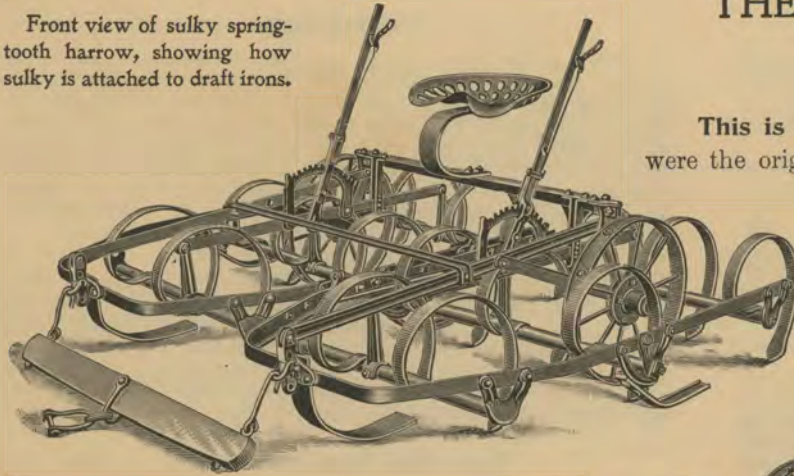
Wash the sweetbreads in salt and water, and parboil twenty minutes. Either cut them in two, or in small pieces, dip in egg, then in rolled cracker crumbs, and fry in a spider in hot butter and lard.

Veal Loaf.

Three pounds of raw veal cutlet chopped fine, two slices of salt pork chopped, two eggs, three teaspoonfuls of salt, one of pepper, two slices of bread crumbed fine, one-half cup of cream or milk. Make into a loaf, dredge with flour and bake three hours. It is nice to put hard boiled eggs through the loaf.



Front view of sulky spring-tooth harrow, showing how sulky is attached to draft irons.

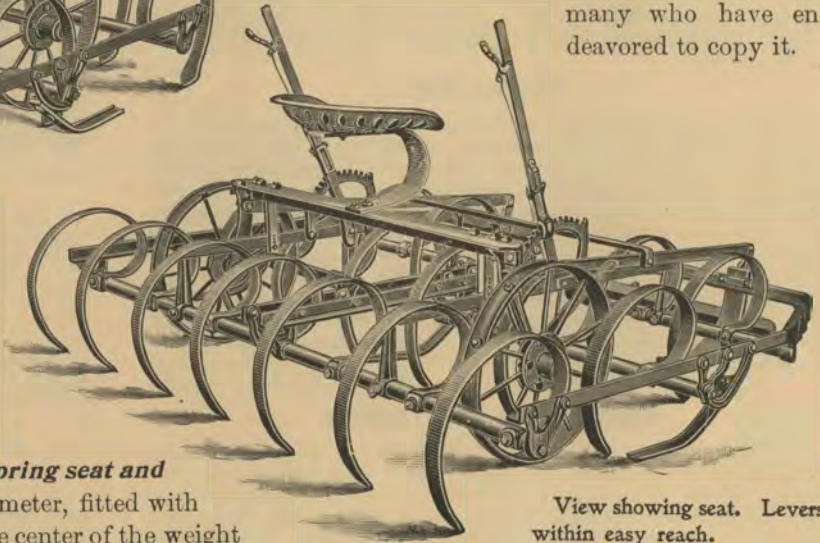


Recognizing that the trade is looking to us to meet a demand for a successful riding spring-tooth harrow which will be satisfactory in its work, we have devoted our best inventive skill to the task, and are now prepared to furnish our customers the only practical sulky spring-tooth harrow ever put on the market.

THE SULKY ATTACHMENT has an easy spring seat and high, broad-faced steel wheels, 20 inches in diameter, fitted with sand-proof bearings. The sulky is located near the center of the weight of the harrow, carrying almost all of it, but allowing just enough to bear on the front shoes to steady the implement and keep it from swinging sidewise.

THE OSBORNE SULKY SPRING-TOOTH HARROW.

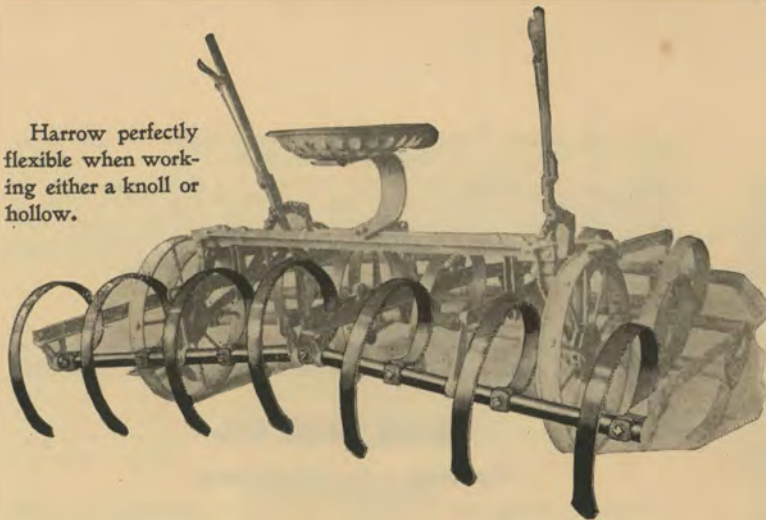
This is another step in advance of all competitors. We were the originators and the first to introduce the all-steel lever set spring-tooth harrow, an implement entirely new in the harrow trade, and its wonderful success is attested by the many who have endeavored to copy it.



View showing seat. Levers within easy reach.



Harrow perfectly flexible when working either a knoll or hollow.



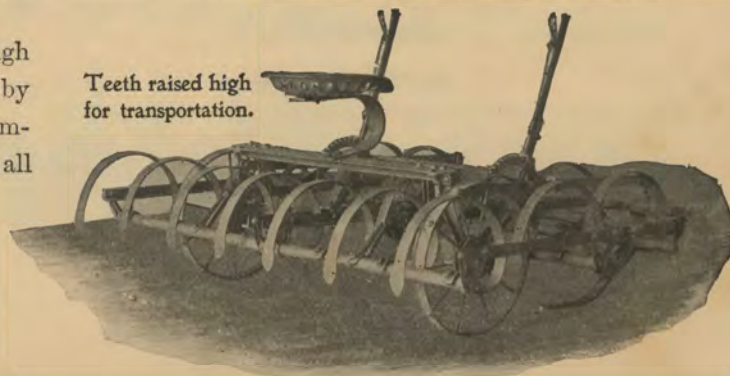
The teeth can be set to cultivate at any required depth, by the set lever.

If it is desired to change the pitch of the teeth, on account of the condition of the soil, or because they have become worn and shortened by long use, it can easily be done by raising or lowering the frame through an adjustment of the shoes at the front of the harrow, and by changing the pins in the lower ends of the slotted brackets on the axle.

On riding harrows where the wheels are attached to tooth beams, the weight of both wheels and driver holds the teeth rigidly to the ground, and a tooth is liable to bend or break when it catches a root or tight stone. **On our harrow the entire weight of the driver is carried on the sulky, and the sections working independently of the sulky attachment, allow the frame to rise, relieving the tooth so it will not break.** By using shoes on the front of the frames, instead of small swivel wheels, the harrow is prevented from running forward on the horses in transportation on down grade, and from swinging sidewise in the field.

No crop can be grown without cultivation, and thorough cultivation means a finely pulverized and mellow soil, obtained by using the Osborne Sulky Spring-tooth Harrow. There is no comparison between it and similar implements, for it is superior to all in simplicity, lightness of draft and thorough efficiency.

Teeth raised high for transportation.





Fried Apples and Pork Chops.

Season the chops with salt and pepper, a little powdered sage and sweet marjoram; dip them into beaten egg, and then into bread crumbs. Fry about twenty minutes, or until they are done. Put them on a hot dish, pour off part of the gravy into another pan, to make a gravy to serve with them, if you choose. Then fry apples, which you have sliced about two-thirds of an inch thick, cutting them around the apple, so that the core is in the center of each piece. When they are browned on one side and partly cooked, turn them carefully with a pancake turner, and cook the other side; dish around the chops, or on a separate dish.

Fried Rabbit.

After the rabbit has been thoroughly cleaned and washed, put it into boiling water for about ten minutes; drain, and when cold cut it into joints; dip into beaten egg, and then into fine bread crumbs, seasoned with salt and pepper. When all are ready dry them in butter for fifteen minutes, thicken the gravy with an ounce of butter and a small teaspoonful of flour, give it a minute's boil, stir in two tablespoonfuls of cream, dish the rabbit, pour the sauce about it, and serve quickly.

Head Cheese.

Clean the head nicely and boil it till very tender. Remove the meat and fat, chop very fine, and season with salt, pepper, sage and a little cloves, while hot. Put into a deep dish and cover with a plate smaller than the dish, that it may rest on the meat. Place on the plate a very heavy weight and let it stand for twenty-four hours. This makes the famous "Pig's Head Cheese."

Pot Pie Dumplings.

BY MRS. DEARBORN.

Mix and sift together one pint of pastry flour, one heaping teaspoonful of Cleveland's Baking Powder and one-half teaspoonful of salt. Beat one egg until thick and light, add one-half cupful of cold water, stir this into the dry mixture, and enough more water to make a

dough stiff enough to hold its shape when dropped from the spoon. Drop the dumplings on a plate a little distance apart and cook in a closely covered steamer for fifteen minutes; or, drop them on top of the boiling stew and cook for the same length of time. The secret of having them light and tender lies in their not being disturbed while cooking, and in not having much liquid around them, if cooked on top of the stew. (Copyright 1891 by Cleveland Baking Powder Co.)

Rabbit Pie.

Line a deep dish with a puff paste or rich biscuit crust; stew the rabbit, season well and pour into the dish; cover with an upper crust and bake.

VEGETABLES.

Cabbage a la Cauliflower.

Cut the cabbage fine as for slaw; put it into a stewpan, cover with water and keep closely covered. When tender, drain off the water, put in a small piece of butter with a little salt, one-half a cup of cream, or one cup of milk. Leave on the stove a few minutes before serving.

Potato Balls or Croquettes.

Four large, mealy potatoes, cold, mash them in a pan, with two tablespoonfuls of fresh melted butter, a pinch of salt, a little pepper, one tablespoonful of cream, and the beaten yolk of one egg; rub it together for about five minutes or until very smooth: shape the mixture into balls about the size of a walnut, or small rolls, dip them into an egg well beaten, and then into the finest sifted bread crumbs. Fry them in boiling lard.

Potatoes in Jackets.

Select fine large potatoes and bake them; take from the oven while hot, cut an oval piece from one side, remove the inside, taking care not to tear skins. Put them in a dish, season with butter, pepper, salt and a little cream or milk; add one or two eggs. Beat all thoroughly together with a fork. Fill the skin, place a small piece of butter on each, return to the oven until brown and serve on a platter.



Baked Tomatoes.

Take a baking dish and put first a layer of tomatoes, either fresh or canned, a layer of onions sliced thin, a layer of bread and butter with pepper and salt, then another layer of tomatoes, onions, and so on until dish is filled. Bake one and one-half hours.

Macaroni with Tomatoes.

Boil one-half pound of macaroni till tender, pour off all the water, then add one-half cup of sweet cream, one-third of a cup of butter, pepper and salt; let all simmer for a short time, but be careful that it does not become much broken; turn into vegetable dish; have ready one pint of stewed tomatoes; season with butter, salt and pepper; pour over the macaroni.

ENTREES.

Apple Fritters.

Make a batter with one cup sweet milk, one teaspoonful sugar, two eggs, whites and yolks beaten separately, two cups flour, one teaspoonful Cleveland's Baking Powder mixed with flour. Chop some good tart apples, mix in the batter and fry in hot lard. Serve with maple syrup.

Clam Fritters.

Twenty-five clams dried well with a clean towel. One pint flour, one small teaspoonful Cleveland's Baking Powder, two well beaten eggs, one-half pint milk, nearly as much clam liquor. Beat until smooth, then stir in the clams. Fry by dropping spoonfuls in hot lard. The clams can be chopped, if preferred.

Corn Fritters.

One pint grated corn, one-half teacup milk, one-half teacup flour, one small teaspoonful Cleveland's Baking Powder, one tablespoonful melted butter, two eggs, one teaspoonful salt, a little pepper. Fry in hot lard.

Oyster Fritters.

Chop one pint of oysters. Take one pint of milk, a little salt and pepper, one small teaspoonful Cleveland's Baking Powder, and flour enough to make a thin batter. Stir in the oysters, drop from a spoon in hot lard or butter and fry a delicate brown.

Omelet.

Beat the yolks and whites of eight eggs separately until light; beat together; add a little salt and one tablespoonful of cream. Have in the omelet pan a piece of butter. When the butter is boiling hot, pour in the omelet, and shake it until it begins to stiffen, when let it brown. Fold double and serve hot.

Omelet.

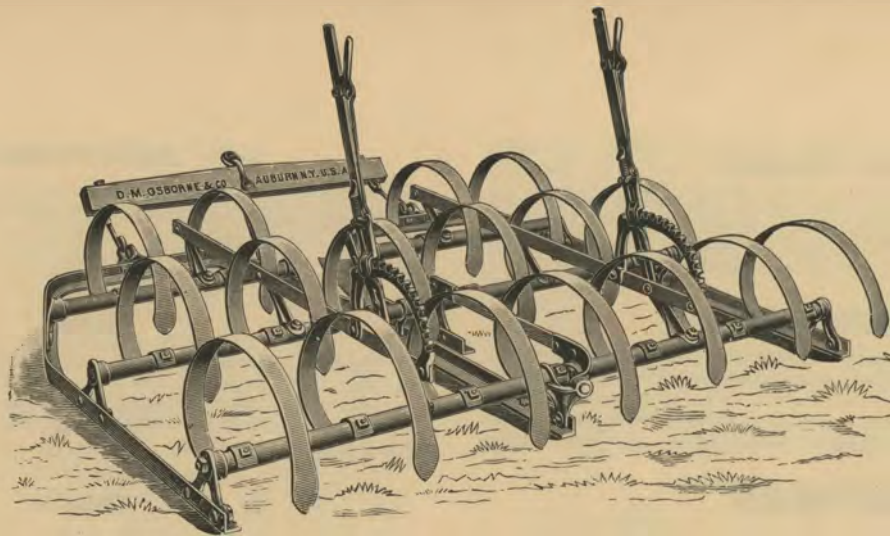
BY MRS. MILLER.

Beat up smooth the yolks of four eggs in a dish. Then beat up into a froth *with a fork* the whites of the four eggs in another dish and sprinkle on the same one-half teaspoonful of Cleveland's Baking Powder. Mix the whites and yolks, and pour into a hot pan and cook the same as for any other omelet. The success of the omelet is in the beating with a fork, and after the omelet is cooked, in getting it onto the plate in its foamy deliciousness.

PUDDINGS.

Apple Pudding.

Fill a buttered baking dish with sliced apples and pour over the top a batter made of one tablespoonful of butter, one-half cup of sugar, one egg, one-half cup of sweet milk, and one cup of flour in which has been sifted one teaspoonful of Cleveland's Baking Powder. Bake in a moderate oven until brown. Serve with cream and sugar, or liquid sauce. Peaches are very nice served in the same way.



Osborne Spring-tooth Harrow. Sizes: 9, 15, 17 and 23 teeth.

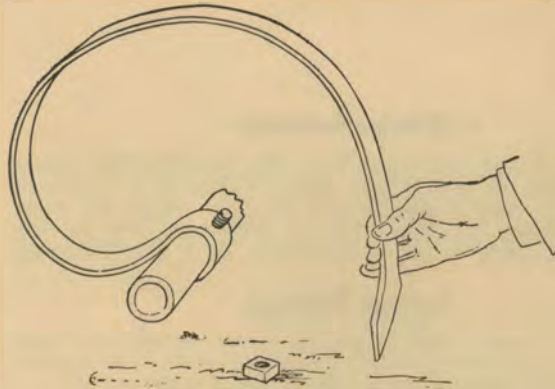
THE OSBORNE COLUMBIA SPRING-TOOTH HARROW.

The champion of all spring-tooth harrows; a masterpiece of skillful construction, built for any and all conditions of soil. The teeth can be adjusted to any depth, while in motion, by the levers on the rear bars, to give any amount of cultivation desired, or they can be lifted high above the ground, for the transportation of the harrow.

The one-piece steel angle bar frames are shaped to withstand all strain without warping; the front part of each is bent upward, sled-runner shape, to allow the harrow to slide over ordinary obstacles and trash, and to render its transportation to and from the field exceedingly easy.

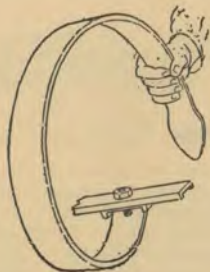
The rear inner side of one of the frames is cut away, to prevent clogging. This is a novel and unusual feature, and is found only on the Osborne; it is a complete and practical remedy to prevent the accumulation of trash between the frames.

The steel pipe tooth bars are mounted in malleable boxes, secured to the frame, and will not bend or break.



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.

The draft is steady and direct, for the harrow has no side motion; all the ground is thoroughly pulverized, for the teeth are so spaced that they will not trail one another.



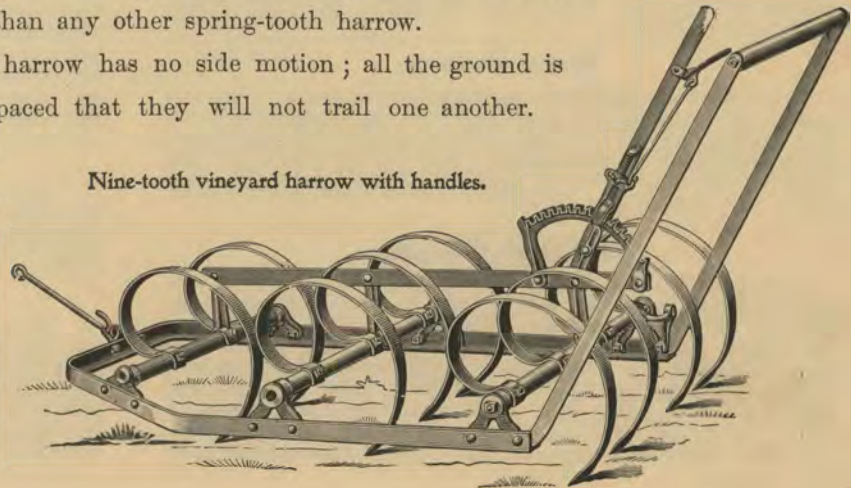
Another tooth fastening
—all the strain on the bolt.

All the superior qualities necessary to a popular and effective implement are found in the Osborne Spring-tooth Harrow. The world-wide reputation it possesses has been fairly and quickly won.

The effectiveness of a harrow depends, to a great degree, upon the quality of the teeth; those used on the Osborne harrows are made of highly tempered spring steel, and are secured to the tubular steel bars by a simple, positive and absolutely reliable fastening.

The ends of the teeth curve two-thirds about the bars where they are bolted. This manner of securing them gives the greatest amount of spring possible without straining the bolts; consequently they are more durable, and their work more thorough, than any other spring-tooth harrow.

Nine-tooth vineyard harrow with handles.





Apple Trifle.

Scald as many apples as will, when pulped, cover the dish you design to use to the depth of two or three inches. Before you place them in the dish add to them the rind of half a lemon grated fine, and sugar to taste; mix half a pint of cream and the yolk of an egg; scald it over the fire, keep it stirring, and do not let it boil; add a little sugar, and let it stand till cold, then lay it over the apples, and finish with the cream whip.

Apple-Tapioca Pudding.

Six tart apples, one cup of tapioca, one and one-half cups of tepid water, one large cup of sugar; pare and core the apples, cut them in quarters, slice them, or leave them whole, as preferred. Wash the tapioca and soak three hours in the tepid water, stir the sugar with the tapioca and pour over the apples, which have been put in a greased pudding dish. Bake about two hours. Serve with cream; sauce is not necessary.

Boston Pudding.

One cup sugar, two-thirds cup butter or one-quarter pound suet minced, one cup sweet milk, three cups flour, two teaspoonfuls Cleveland's Baking Powder, two tablespoonfuls molasses, one cup seeded raisins, a little salt. Boil four hours. One pint of milk can be used instead of one cup, with bread crumbs soaked in it, and only *one cup* flour. Serve with rich liquid sauce.

Baked Apple Dumplings.

One quart flour, two teaspoonfuls Cleveland's Baking Powder, one-half teaspoonful salt, mixed well together. Add one large tablespoonful butter and lard mixed, and enough sweet milk or water to make a soft dough. Roll out into half-inch sheets. Peel and quarter some good tart apples. Put each quarter on a square of dough, sprinkle over it sugar, and press the edges together firmly. Place in a deep pan, sprinkle over sugar and a little cinnamon, and put a bit of butter on each. Fill the pan with water (boiling) just leaving top of dumplings uncovered, then bake forty-five minutes. Serve with sweetened cream or hard sauce.

Cottage Pudding.

One cup of sugar, one cup of milk, three tablespoonfuls of melted butter, one egg, one pint of flour, three teaspoonfuls of Cleveland's Baking Powder sifted thoroughly into the flour. Cream the butter, add the sugar, and beat light. Add the beaten egg, then the milk, lastly the flour. Bake in a loaf in a buttered tin. Serve with liquid sauce.

Cottage Pudding.

One cup of sugar, butter the size of a walnut, one-half cup of milk, two eggs beaten separately, one and one-half cups of flour, two teaspoonfuls of Cleveland's Baking Powder. Serve with lemon sauce.

Cream Tapioca.

Soak a cup of tapioca all night in milk enough to cover it; in the morning add nearly a cup of sugar and the yolks of three eggs beaten; put a quart of milk into a pail and set into a kettle of water on the stove; when the milk boils add the tapioca, and let it boil until thick; take from the stove and flavor to taste, adding also the whites of the eggs beaten stiff.

Cottage Pudding.

One cup of milk, one-half cup of sugar, one egg, two tablespoonfuls of melted butter, one teaspoonful of Cleveland's Baking Powder sifted with one pint flour. Bake half an hour, and serve with liquid sauce.

Delicious Peach Pudding.

Fill a pudding dish with whole peeled peaches, and pour over them two cups water. Cover closely, and bake until peaches are tender, then drain off the juice from the peaches, and let it stand until cool. Add to the juice one pint sweet milk, four well beaten eggs, a small cup flour with one teaspoonful Cleveland's Baking Powder mixed in it, one cup sugar, one tablespoonful melted butter and a little salt. Beat well three or four minutes, and pour over peaches in dish. Bake until a rich brown, and serve with cream.



Dutch Apple Pudding.

One pint flour, one and one-half teaspoonfuls Cleveland's Baking Powder, one-half teaspoonful salt. Rub one-quarter cup butter into the flour, beat one egg light, add to it three-quarters cup cold water, and stir into the flour. Spread in well buttered shallow pans. Pare, core and quarter four or five sour apples, place them on the dough, and sprinkle over them two tablespoonfuls sugar. Bake twenty or thirty minutes. Serve at once with lemon sauce.

Feather Crust.

BY MISS ANDREWS.

Two cups flour, two teaspoonfuls of Cleveland's Baking Powder, half a teaspoonful of salt, two tablespoonfuls of butter, one egg, three-quarters of a cup of milk, four tart apples. Place the flour in the sieve and add the baking powder, sift into a mixing bowl and rub in the butter. Add the salt to the egg and beat to a thick cream with a Dover beater in a small bowl with straight sides. To the flour add the apples sliced thin, then the egg and milk. Place in buttered cups. The half-pound baking powder cans answer this purpose nicely. Put on the covers and steam one hour and a quarter. Serve with a liquid or a hard sauce. Almost any fruit can be substituted for the apples in this receipt. The same batter makes the best of crusts for meat pies and fruit pudding.

Fruit Puff Pudding.

Mix well one pint flour, one and one-half teaspoonfuls Cleveland's Baking Powder and a little salt. Make into a soft batter with milk. Put into well greased cups a spoonful of batter, then one of strawberries, or any fruit preferred, then another of batter. Steam twenty minutes. Serve with liquid sauce.

Favorite Pudding.

One cup sugar, one cup milk, one egg, two cups flour, one and one-half teaspoonfuls Cleveland's Baking Powder. Flavor with nutmeg. Put in the bottom of a pudding dish two cups sliced apples, peaches peeled and halved, cherries or any fruit desired, then pour over the mixture and bake. When done turn on to serving dish, fruit side up. Serve with liquid sauce.

Grandma's Baked Indian Pudding.

One quart of milk, seven tablespoonfuls of Indian meal, one cup of molasses, one-half teaspoonful of salt. Put the milk in a kettle; when scalding hot stir in the meal which has been wet with a little cold milk. Take from the stove and add the molasses, the salt and half a cup of cold milk. Two tablespoonfuls of chopped suet make it richer. Bake two hours in a moderate oven.

Margie's Brown Betty.

One cup of bread crumbs, two cups of chopped tart apples, one-half cup of sugar, one teaspoonful of cinnamon, two tablespoonfuls of butter. Butter a pudding dish, put a layer of bread crumbs in the bottom, then a layer of chopped apples with a sprinkle of sugar, cinnamon and small pieces of butter, then a layer of bread crumbs, and so on until the dish is full, having bread crumbs for the top. Cover the dish with a pan, bake three-quarters of an hour, then uncover and brown. Serve with sugar and cream, or butter and sugar. A particularly nice dish for a nursery dinner.

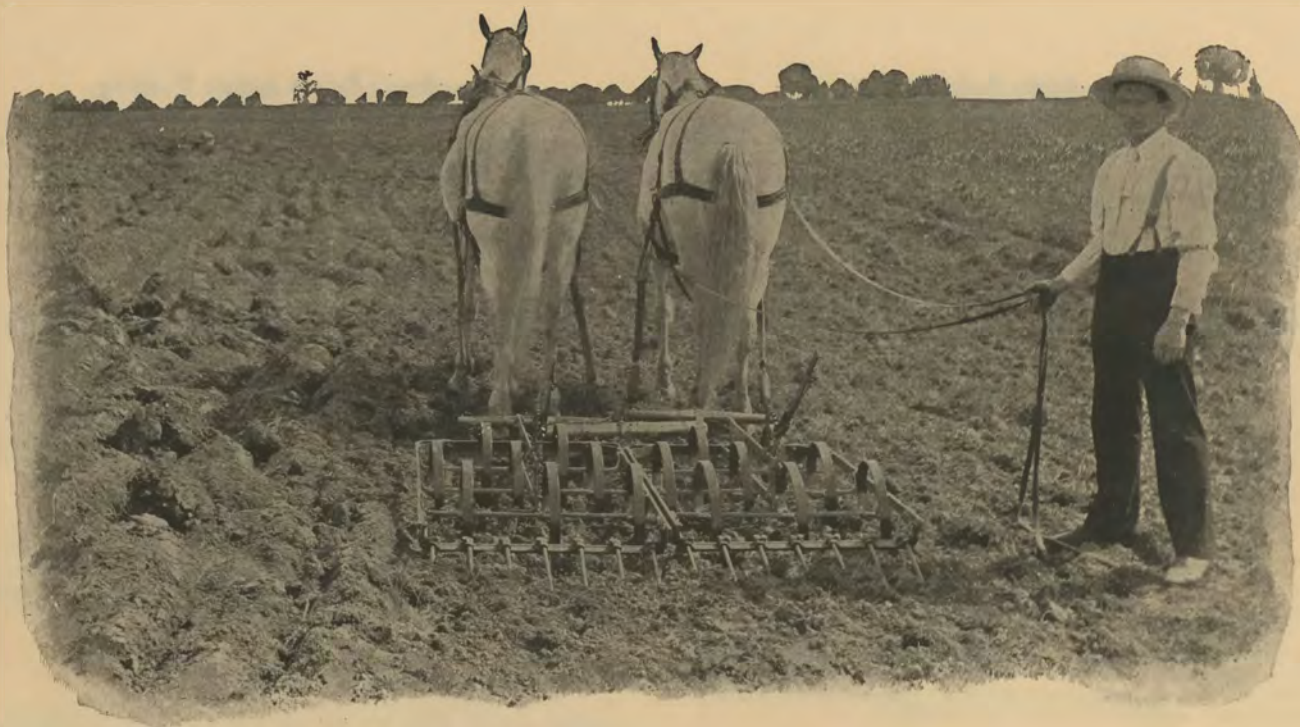
Peach Cottage Pudding.

Stir sliced peaches into a batter made of one-half cup sugar, three tablespoonfuls melted butter, one beaten egg, one cup milk, one pint flour, and one and one-half teaspoonfuls Cleveland's Baking Powder. Bake in a loaf, and serve with hard sauce.

Peach Cups.

BY MISS CORNELIUS.

One pint of milk, two and one-half cups of flour, one-half teaspoonful of salt, two eggs, one tablespoonful of melted butter, two teaspoonfuls of Cleveland's Baking Powder. Peaches as required. Beat the eggs without separating until light, add the milk, salt and flour; beat thoroughly, add the melted butter and baking powder, grease some custard cups, half fill with the batter, put into each cup a half peach, cover with batter, dust with powdered sugar, stand the cups in a baking pan half filled with boiling water, bake twenty minutes in a quick oven. Serve with sweetened cream.



THE OSBORNE COMBINATION HARROW.

8-tooth sections furnished with draw bars for 2 or 3 sections, as ordered, making harrow 8, 16 or 24 teeth.

The most practical and economical implement ever designed.

The double effect of a lever set spring-tooth harrow opening the soil, and a lever set peg-tooth harrow putting it in a perfectly level and smooth condition.



**A BROAD EXTENT OF EFFECTIVE USEFULNESS
FOUND ONLY IN THIS HARROW.**

The frames are strong and powerful, and act independently ; the side bars are made of channel steel and are rigidly fastened to front and rear angle steel end pieces.

The broad, easy sloping shoes in the front, and the slanting steel teeth in the rear, allow the harrow to ride smoothly over the ground. The frame is carried high, giving a complete clearance for trash.

The teeth and their bars are similar to those on our other spring-tooth harrow, and are fastened in the same way. The ground is leveled and all lumps thoroughly pulverized

Osborne Combination Harrow.

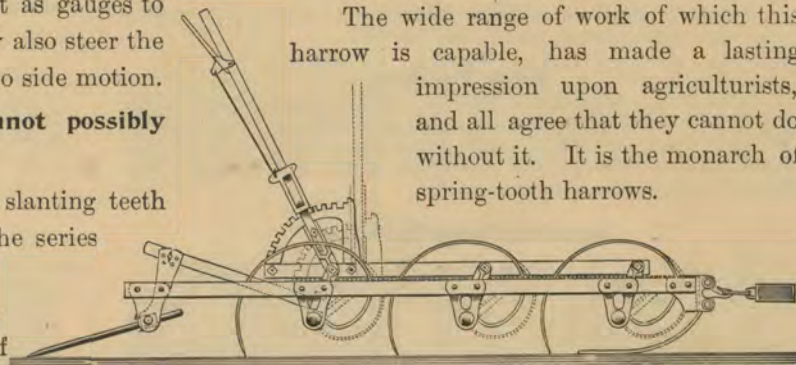
by the slanting teeth ; together with shoes they act as gauges to regulate the working depth of the spring teeth ; they also steer the harrow in a straight line, and destroy all tendency to side motion.

The spring teeth being set alternately, cannot possibly trail each other.

More or less weight can be thrown upon the slanting teeth by changing the draft, by hitching high or low in the series of holes in the draft iron on the front of the frame.

Any adjustment of the teeth to drag deep or shallow can be secured by the levers on the rear of the frames, within easy reach of the operator.

The wide range of work of which this harrow is capable, has made a lasting impression upon agriculturists, and all agree that they cannot do without it. It is the monarch of spring-tooth harrows.



Sectional view of Combination Harrow.



Sweet Shortcake.

Beat a lump of butter size of an egg to a cream, add one cup of sugar, two eggs, whites and yolks beaten separately, one cup sweet milk, one and one-half teaspoonfuls Cleveland's Baking Powder, and flour enough to make as stiff as cake. Bake in two jelly tins, and spread mashed sweetened strawberries between layers, and on top whole berries with sugar sprinkled over them. Serve with mashed berries sweetened.

Steamed Berry Pudding.

One cup of sugar, two eggs, one and one-half teaspoonfuls Cleveland's Baking Powder, two cups of flour, one cup of sweet milk, two cups of berries. Steam about two hours.

Suet Pudding.

Two eggs, one cup milk, one-half cup molasses, one-half cup of suet chopped fine, one teaspoonful of salt, two teaspoonfuls Cleveland's Baking Powder sifted in three small cups of flour, cloves, cinnamon, nutmeg, and as much fruit (stoned raisins and citron) as you like. Steam two hours.

Sauce.—One-half cup of butter, two cups of sugar, a little boiling water and a little nutmeg, beaten well together.

Snow Pudding.

One-half box of gelatine soaked ten or fifteen minutes in four tablespoonfuls of cold water; then add a pint of boiling water, the juice of two lemons, and one cup of sugar; strain it and set it away to cool. When cool—not stiff—add the well-beaten whites of three eggs. Mix thoroughly, pour into a mold and cool.

Steamed Apple Pudding.

Pare, quarter and take the cores from tart apples, enough to fill pudding dish, rub a piece of butter the size of an egg into one pint of flour in which are sifted two teaspoonfuls of Cleveland's Baking Powder. Mix with milk with the spoon, about the consistency of soda biscuit. Put the dish in a steamer over a kettle of boiling water and steam two hours. This is a general favorite, surpassing the old-fashioned dumplings.

Sauce.—Two tablespoonfuls of flour, one cup of sugar, a little nutmeg, a tablespoonful of butter. Mix these ingredients together with one tablespoonful of cold water. Put into a saucepan and pour on slowly a little less than a pint of boiling water.

Snow Pudding.

Dissolve one box of gelatine in one pint of cold water. When soft, add one pint of boiling water, the grated rind and juice of two lemons; two-and-a-half cups sugar, whites of five eggs (well beaten). Let it stand until cold and almost firm; then beat in the whites of eggs.

Sauce for Snow Pudding.—One quart of rich milk, the yolks of five eggs; add one-half cup of sugar, and flavor with vanilla, as for stirred sugar.

Steamed Graham Pudding.

Two cups graham flour, one cup of milk, one cup of molasses, one cup of raisins, one egg, one teaspoonful of soda, one-half teaspoonful of cloves and cinnamon each, a little nutmeg, a pinch of salt. Put the flour in a basin, then add all the other ingredients. Mix thoroughly. Flour the raisins, put the mixture in a greased pan and set in a steamer and steam three hours. An excellent pudding. Serve with hard sauce.

Whortleberry Pudding.

Rub thoroughly one-half cup of butter with one and one-half cups of sugar; add one cup of sweet milk, two eggs, three cups of flour, two teaspoonfuls of Cleveland's Baking Powder. After adding one cup of the flour, stir in one pint of berries, then the remainder of the flour. To be eaten hot, with hard sauce.

PIES.

Currant Pie.

Short Paste.—One pound of flour, one-half pound of butter, two ounces of finely powdered loaf sugar, a pinch of salt, one tablespoonful of Cleveland's Baking Powder. Mix the powder, flour, sugar and salt thoroughly together, then rub well in the butter, and make into a stiff paste by adding a little milk; roll out once very thin.

Fruit.—One pint of currants, the yolks of one or two eggs; sweeten to taste. The whites may be used for meringue, if desired.



Pastry with Baking Powder.

One and one-half cups flour, one saltspoon salt, one saltspoon Cleveland's Baking Powder, one-third to one-half cup of butter and lard mixed.

Pumpkin Pie.

One pint of stewed pumpkin, two or more eggs, sweeten with molasses and sugar to taste, one pint of rich milk, or cream, which is better. A little salt, season with cinnamon or nutmeg, and ginger also if liked, stir well together and bake with one crust only, in a deep pie dish, and in a quick oven.

DESSERTS.

Arrow-root Custards.

Boil one pint of milk, and while boiling stir into it one tablespoonful of arrow-root, mixed smooth with a little cold milk, add a little salt and let it boil three or four minutes, and then let it cool and add two beaten eggs, sugar and nutmeg to taste. Return to the range, and stir all the time till it boils; then pour into custard cups.

Apple Cream.

Six apples stewed and mashed to a pulp. When the apples are cold, add six eggs beaten very light, and five tablespoonfuls of sugar; whisk until stiff, and serve with sweetened cream flavored to taste.

Floating Island.

Beat the yolks of three eggs until very light; sweeten and flavor to taste; stir into a quart of boiling milk; cook until it thickens; when cool, pour into a low glass dish; whip the whites of the eggs to a stiff froth; sweeten, and set over a dish of boiling water to cook. Take a tablespoon and drop the whites on top of the cream, far enough apart so that the "little white islands" will not touch each other. By dropping little specks of bright jelly on each island a pleasing effect will be produced.

Katie's Cup Custards.

One quart of milk, the yolks of eleven eggs, one large cup of sugar, a pinch of salt, nutmeg to taste. Scald the milk one hour, then measure, Add the sugar, the eggs well beaten, salt and nutmeg. Pour into custard cups and bake in a dripping pan filled with hot water in a moderate oven, about half an hour. It is well to make these on the same day with angel's food.

Ice Cream.

One quart of cream, one quart of milk, two eggs, one pound of sugar, two teaspoonfuls of vanilla. Scald the milk, sugar and eggs together until it thickens; strain and set aside until cold. Whip the cream and beat into the custard thoroughly; add the vanilla and freeze. If not sweet enough add more sugar. Equal parts of vanilla and lemon extract make an excellent flavoring.

Lemon Jelly.

One package of gelatine, one cup of lemon juice or six lemons, two and one-half cups of sugar, two quarts of water. Dissolve the gelatine in one pint of water, add the other three pints of boiling water, the lemon juice and sugar. If desired, it can be colored a beautiful red with cochineal syrup, add a few drops at a time until the color is satisfactory. Strain into molds and set into the ice chest to harden.

Whipped Cream.

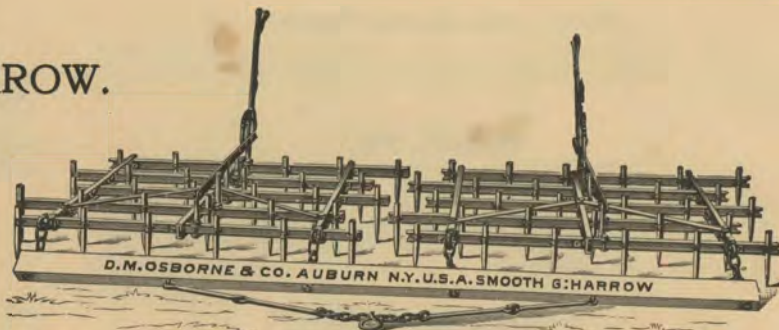
One pint of sweet cream sweetened to taste, one teaspoonful of vanilla, or other flavoring. Put the cream in a bowl and beat with a wheel egg beater until thick, then sweeten and flavor. The cream will beat better if cold. The whites of two or three eggs beaten to a stiff froth may be added. This makes a delicious dessert. Different jellies or fruit may be served with it.



THE OSBORNE COLUMBIA PEG-TOOTH HARROW.

For finely pulverizing the soil ready for the seeder, or to follow and cover the seed, this harrow has an enviable reputation for thorough effectiveness.

The frame bars, tooth beams and teeth are made of highly carbonized steel, insuring its great strength and wearing qualities.



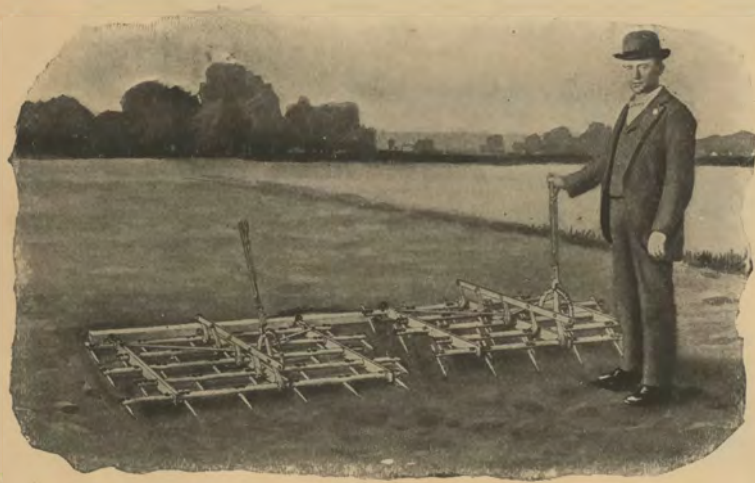
Made with 30 and 35 teeth in each section ; as many sections can be coupled together as desired.

The levers on the rear beams, within easy reach of the driver, regulate the set of the teeth at any angle desired, from a pitch forward to a horizontal position for transportation.

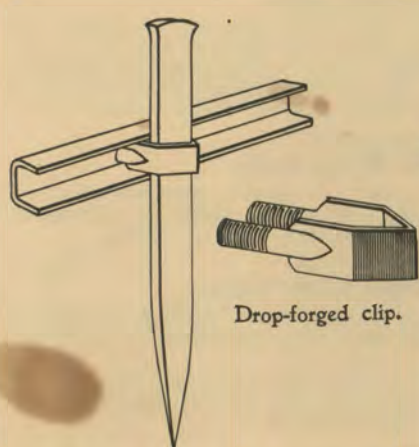
One section can be detached from the draw bar and used as a single-horse harrow.

If it is desired to drag the harrow at an angle, the draft ring must be shifted on the chain of the draw bar.

This implement adapts itself to the surface of the ground, so that, whether going over ridges or hollows, the soil is thoroughly pulverized.



Teeth slanted for transportation ; levers in easy reach of the driver.



Drop-forged clip.

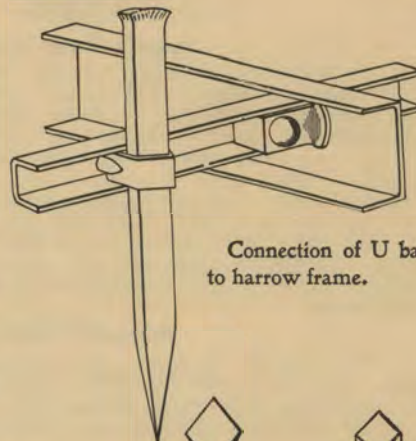


Tooth securely bolted to U bar.

THE TOOTH BARS ARE U SHAPE.

THE DIAMOND-SHAPED

reversible teeth are secured to the bars by steel *drop-forged clips*, which, if loosened, will allow of the teeth being raised, lowered or reversed, giving them a long life of continuous



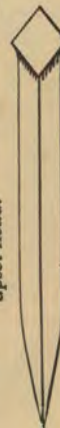
Connection of U bar to harrow frame.

use, and making it possible to keep them in service until almost completely worn out.

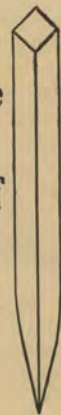
One, two, three or four sections are furnished, as desired, with thirty or thirty-five teeth in a section. Each complete harrow is equipped with a draw bar of suitable width.

No farm is fully supplied without it. It is adjustable to any condition of ground it is required to cultivate; it is easy to operate, and is the best of its kind.

Osborne diamond-shape tooth, upset head.



We are
not
Two of
a
kind



The ordinary square tooth.



CAKES.

Angel's Food Cake.

The whites of eleven eggs, one and one-half tumblers of granulated sugar, one tumbler of flour, one teaspoonful of cream tartar, one teaspoonful of vanilla. Break the whites of the eggs in a large cake bowl, add a pinch of salt and beat very light with an egg beater. Sift the sugar once and stir lightly into the beaten whites, add the vanilla, or other extract if preferred, sift your flour four times, then measure; add the cream of tartar and sift once more and stir lightly into the eggs and sugar. Bake from forty minutes to an hour in a moderate oven. A tin with a tube in the center is much to be preferred. Do not grease the tin, and when taken from the oven turn upside down on a sieve to cool. Tins made purposely for this cake can be obtained.

Almond Cake.

Three-quarters cup butter, one cup sugar, half cup sweet milk, three eggs, whites and yolks beaten separately, two cups flour, two level teaspoonfuls Cleveland's Baking Powder, and one pound almonds blanched and sliced, stirred in last. Save a few whole ones to put on top of icing.

Belden Cake.

BY MISS BURRELL.

Four cups of flour, two cups of sugar, one cup of butter. Three-quarters of a cup of milk, four eggs, one teaspoonful lemon extract and two teaspoonfuls of Cleveland's Baking Powder. Cream butter, add sugar and beat thoroughly; add the yolks of eggs and milk, then the flour and extract. Beat the whites of eggs to a stiff froth and stir in carefully. Add the baking powder and bake in moderate oven forty-five minutes.

Boiled Frosting.

One pint granulated sugar, moisten with water sufficient to dissolve it. Let it boil until it threads from the spoon, stirring it often. Beat the whites of two eggs to a stiff froth, place in a deep dish, and turn the boiling sugar over them; beat quickly until of the right consistency to spread over the cake. This is sufficient for two loaves. Flavor as you like.

Coffee Cake.

One-half cup butter, one cup brown sugar, one cup molasses, one cup strong coffee (boiled), one beaten egg, four cups flour, one heaping teaspoonful Cleveland's Baking Powder, one tablespoonful cinnamon, one teaspoonful cloves, two pounds seedless raisins, one-quarter pound sliced citron. Dredge the fruit and add last. Bake one hour.

Cold Water Cake.

One and one-half cups sugar, one quarter cup of butter, two and one-half cups flour, two eggs, one cup of water, two teaspoonfuls Cleveland's Baking Powder. Flavor with vanilla or lemon.

Chocolate Layer Cake.

One cup of sugar, one-half cup of butter, two eggs, one-half cup of sweet milk, two cups of flour, two teaspoonfuls of Cleveland's Baking Powder.

Filling.—One-half cake of chocolate, grated and dissolved in a small cup of milk; let it boil; then add one-half cup sugar, small piece of butter, a little salt and flavoring.

Crullers.

One cup sugar, one tablespoonful butter, two eggs, one cup rich sweet milk, three cups flour mixed with two teaspoonfuls Cleveland's Baking Powder, one teaspoonful salt.

Cream Crullers.

One and one-half cups sugar, two cups cream, two eggs, two teaspoonfuls Cleveland's Baking Powder mixed in enough flour to roll out soft. Cut in desired shapes, and fry in very hot lard.

Delicate Cake.

One cup of butter, two cups of sugar, one cup of sweet milk, three and one-half cups flour, whites of five eggs, three teaspoonfuls of Cleveland's Baking Powder. Beat together thoroughly, adding the whites last. Flavor with bitter almond or vanilla.



Delicate Cake.

Three-quarters cup butter rubbed to a cream, with two cups sugar, one-half cup sweet milk, three cups flour, one and one-half teaspoonfuls Cleveland's Baking Powder, whites of eight eggs well beaten. Add flour and eggs alternately. Flavor.

Doughnuts.

BY MRS. LINCOLN

Beat one egg, add one cup fine granulated sugar, and beat till very light and white. Add one cup new milk, without stirring. Then sift in one pint pastry flour to which has been added three level teaspoonfuls Cleveland's Baking Powder, one level teaspoonful salt and half a nutmeg grated. Beat this thoroughly, then add quickly enough more flour to make a firm but soft dough. Roll out one-half inch thick, cut into rings with an open cutter, or into narrow strips, and twist them into shape. Fry in half lard and half suet or beef drippings, and have the fat hot enough for the dough to rise to the top instantly. Turn them over as soon as the underside is a golden brown, and when done on the other side drain them carefully. (*Copyright 1891 by the Cleveland Baking Powder Co.*)

Doughnuts.

BY MRS. GREEN.

Mix well together three cups sifted pastry flour, two teaspoonfuls Cleveland's Baking Powder, one-half teaspoonful salt, and one salt-spoon mace. Beat one egg, add to it one-half cup sugar, one teaspoonful melted lard and one-half cup milk. Mix with the dry ingredients, cut in rings and fry. This rule makes twenty.

Delicate and Fruit Cake.

Cream three-quarters cup butter with two cups sugar. Add one cup sweet milk, two and one-half cups flour, two teaspoonfuls Cleveland's Baking Powder, whites of five eggs. Flavor with lemon juice. Take four large tablespoonfuls of this and add spices to suit and one cup raisins, one-half cup sliced citron dredged with flour, or one-half cup of molasses and one small cup flour with fruit. Bake one layer of dark mixture and two of white in flat square tins, and put together with boiled icing—the dark layer in the middle.

Golden Jumbles.

The yolks of eleven eggs, one cup of butter, two cups of sugar, one-half cup sweet milk, three teaspoonfuls of Cleveland's Baking Powder, two and one-quarter cups of flour, making nearly as stiff as pound cake. Bake in thin cakes in square tins or in a dripping pan. When baked moisten the top with sweet milk, while hot, and sprinkle with sugar. Cut from the tins in small squares.

Hickory-nut Cake.

One cup of butter rubbed to a cream, with two cups sugar, one-half cup sweet milk, three cups flour, one teaspoonful Cleveland's Baking Powder, whites of eight eggs, and one pint hickory-nut kernels, or half nuts and half raisins. Add flour and beaten whites alternately. Dredge the nuts slightly with flour.

Ice Cream Cake.

One cup of butter, two cups of sugar, three cups of flour, four eggs and two teaspoonfuls of Cleveland's Baking Powder.

Filling.—Beat the whites of two eggs very stiff. Pour over two cups granulated sugar, one-half cup boiling water, and boil until stiff, but not brittle, then pour it over the beaten whites, beating all the time, and while hot sift in one-half teaspoonful of citric acid and one teaspoonful of vanilla. Beat this mixture until cold. When it is cold spread between the layers and on top of cake.

Orange Cake.

Two cups of white sugar, two cups flour, one-half cup water, yolks of five eggs and whites of four, beaten separately, a little salt, two teaspoonfuls of Cleveland's Baking Powder, the juice and grated rind of two oranges. Bake in layers.

Orange Jelly.—The juice and rind of two oranges, one-half teacup of sugar, enough water to dissolve one and one-half teaspoonfuls of gelatine. Let it all boil ten minutes, and spread between the layers, and if desired, frosting may crown the whole. This is a nice dish for dessert. Half the quantity is enough for a small cake.

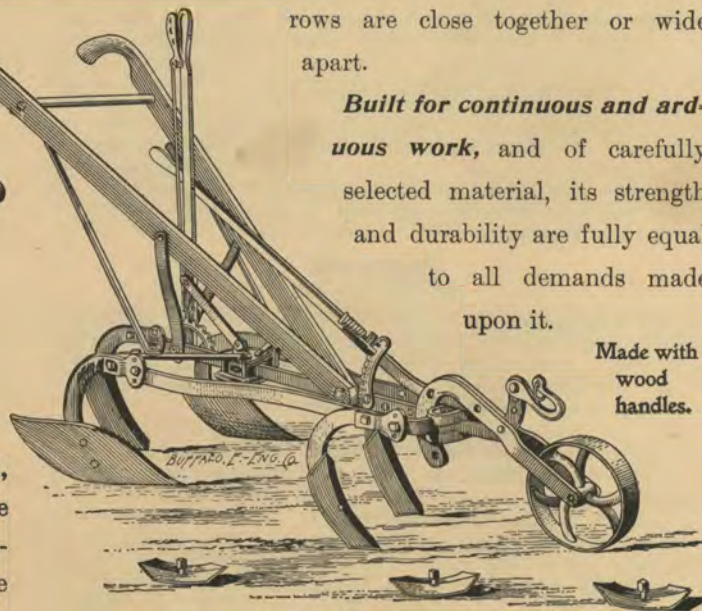


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