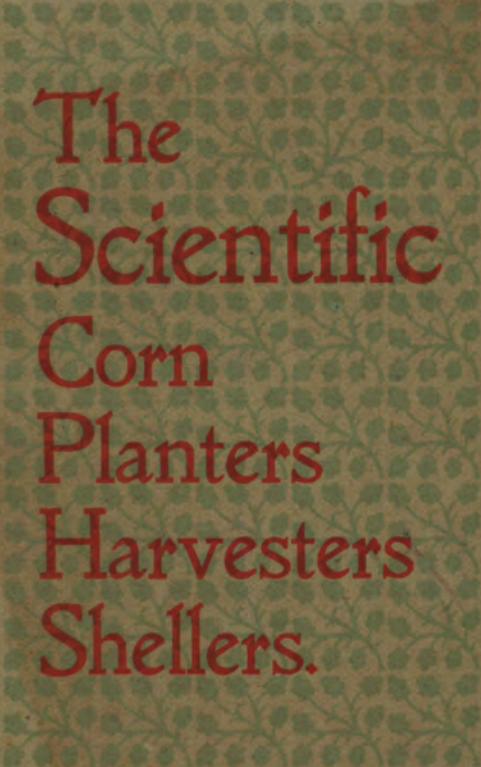




The
Scientific
Corn
Planters
Harvesters
Shellers.

Grinding
Mills.

The Foos
Mfg Co.

SPRINGFIELD, OHIO.

Farmers'
Tools.



WE trust that our friends and patrons, and all interested in advanced methods and ideas for feeding stock, may be interested in this, our 12th Annual Catalogue. In all these years we have urged the use of all the product of corn as a valuable food, and our chief aim has been to perfect our machinery to its preparation, and the success that has followed this effort is shown in the general adoption of these ideas by practical feeders, and the large demand made upon us for our mills, and the universal satisfaction which they have given the users, so that to-day we are proud to say THE SCIENTIFIC is acknowledged as the standard of excellence in this line the country over. In addition to our Mills, we have Corn Planters, Corn Harvesters and Corn Shellers, giving us a line of machines for planting, cutting, shelling and grinding corn. We also make Corn Meal Bolters, Forges and Farmers' Tools, Horse Powers, etc., all these machines being improved and perfected in the light of practical experience and observation. With our large factory, fully equipped with suitable machinery and with skilled workmen, we have every possible facility for doing our work cheaply and well, and we solicit the patronage of all in need of goods in our line, assuring them of the best possible attention to all their wants.

THE FOOS MFG. CO.



NEW WORKS ERECTED 1890.—Dimensions: Main Building, 60 x 230 Feet, Four Floors and Basement. Blacksmith Shop, 24 x 34 Feet. Warehouse 50 x 125. Foundry, 80 x 150 Feet.

COB MEAL.

THIS is our hobby, and we have thoroughly urged the use of such feed ever since we have been making mills, and after ten years of experience and observation would urge it even stronger than before. In fact, we were the first manufacturers who made a specialty of mills for grinding ear corn, and we believe this feed is now acknowledged by nearly every practical feeder as of great value for all kinds of stock. We notice, too, that other manufacturers are now following our example, and making mills for doing such work, none of them, however, equaling the "Scientific." We will not attempt at length to produce arguments as to the nutritive value of this feed, but for the benefit of any who may doubt it, will copy from good authority on the subject which we think will be sufficient; but shall be glad to correspond with any persons desiring any further information.

CORN COBS HAVE A NUTRITIVE VALUE.

The result of a chemical analysis made at the Agricultural Department at Washington, D. C., by the United States Chemist, shows the nutritive value of corn cobs alone to be 41.52 per cent., and containing the same form of nutritive matter as is

found in a large per cent. of our best grains, and nothing whatever of an injurious nature. The following is an analysis of corn and cob under the signature of H. W. Wiley, United States Agricultural Chemist, at Washington, District of Columbia:

	COB.	KERNEL.
Water.....	9.33 per cent.	10.49 per cent.
Ash.....	1.33 " "	1.55 " "
Oil.....	.47 " "	5.49 " "
Carbohydrates.....	56.01 " "	69.72 " "
Crude Fibre.....	30.36 " "	2.13 " "
Albuminoids.....	2.50 " "	10.62 " "
	100.00	100.00

A careful study of the above analysis is convincing that corn cob is of value, and should be utilized in connection with the kernels grown upon it.

Professor H. A. Weber, of the Ohio Agricultural College, writes us as follows:

"Several analyses of cobs and corn meal show that cob has less protein, nitrogen free extract, and fat, than the corn, and consequently the corn and cob meal has a lower food value than the corn meal, but ground cob is by no means without food value. It is equal to its own weight of poor hay or good straw. Hence, in the feeding of cattle, horses, sheep, etc., animals which require a certain amount of rough feed, in order that the more concentrated feeding stuffs, as grain or bran, may be fully digested, the cob meal will replace in a proper ratio its own weight of straw or poor hay, and its equivalent amount of good hay, corn or other feeding stuff.

"Very truly yours,

H. A. WEBER."

EAR CORN WITH SHUCKS ON.

If it is agreed, as we claim, that ground ear corn is valuable as feed, it will not require any argument to convince the reader that the shucks, in which the ear grows, ground up together with the cob and grain, must add largely to its value as feed. Nor is this merely a theory. The fact has been fully established by recent experiments, and we predict that at no distant day the custom of pulling (or, as it is called in some localities, jerking) the corn from the stalk and grinding shuck, cob and grain together, will be practiced by a great majority of feeders. It has been proved that the shucks, with the cob, aid digestion and keep stock in healthful condition, largely preventing colic and other troubles, and it is surely a great saving if the entire ear of corn, as it grows, can be utilized, and the labor of husking saved. Many feeders are also grinding all their

CUT CORN FODDER, HAY AND STRAW, claiming (and it seems reasonable) that the sharp ends of straw, hay and joints in fodder frequently cause sore mouths and irritate the stomach and other parts. This becomes impossible when the

feed is ground and reduced to a soft, palatable product, which can be done on the "Scientific," and we do not know that it can be done on any similar mill, although we have seen it tried, but without success. These matters, while they may seem trivial, will bear investigation, as in this day of small margins and close competition it becomes necessary to utilize everything of value and give heed to every point, though it may be small, which prevents the best development and most rapid gain and improvement in your stock. These matters are to be carefully considered in the purchase of a Feed Mill, and you cannot afford to select a mill that does not offer the opportunity to test them to your own satisfaction, and at the same time does all other kinds of grinding for feed. This the "Scientific" affords and is the only Feed Mill that does.

OTHER GRAINS.

While we make a specialty of mills for grinding corn with cobs, shucks and stalks, our mills are just as practical for grinding **all other grains**, and do the work better than most mills intended for such purpose alone, and the cost to the user is no more.

CORN MEAL.

We are aware that many customers buying a Feed Mill want to use it in making corn meal for their own use, or in a limited way for their customers. We are convinced the "Scientific" is the most practical for this work, as it surely is for all others for which a Feed Mill can be used. We do not claim that we can grind so all the grain will be reduced as fine as can be done on burr stones. We could dress our plates so this could be done, but do not regard it as practical to adapt a Feed Mill especially to such work. We do claim, however, that the regular plates in our mill will grind so that one-half to three-quarters of the product will be as fine as can be made on the stones. This can be sifted out and the remaining coarse product re-ground, or used as feed, as may be desired. We produce this large proportion of soft meal on the fine corrugations on the outer edge of our plates (see page 11) which in this respect are much better

adapted to such work than plates used in other feed mills. In this connection we would refer to our Bolter, page 39 which can be used separately or attached to the mill. We have numerous customers, however, who grind all their own meal, and for customers, doing satisfactory work in one grinding and without sifting, but we recommend the use of a bolter, as all the grit (which will be found even on unbolted meal made on stone burrs) can be removed. But to any one wanting mills for above purposes, especially, we would recommend our Burr Stones (see pages 59 to 62.)

GRAHAM FLOUR.

We make no special claim on this work, and do not make our mills with any special reference to it, but can refer to many customers who have reported making Graham Flour for their own use and the entire neighborhood, and the work was considered equal to that done on stones.

THE SCIENTIFIC IN DETAIL.

It is our purpose here to give a full and complete detailed description of some of the special features of our power mill, and illustrate them with cuts so that any one can understand why our mill is superior to others, and see at once how remarkably simple it is, and how well adapted to the work intended. A careful consideration of these matters and comparison with other mills will, we believe, convince any one that the "Scientific" is the "BEST MILL ON EARTH." We would first, however, in a general way, make reference to the

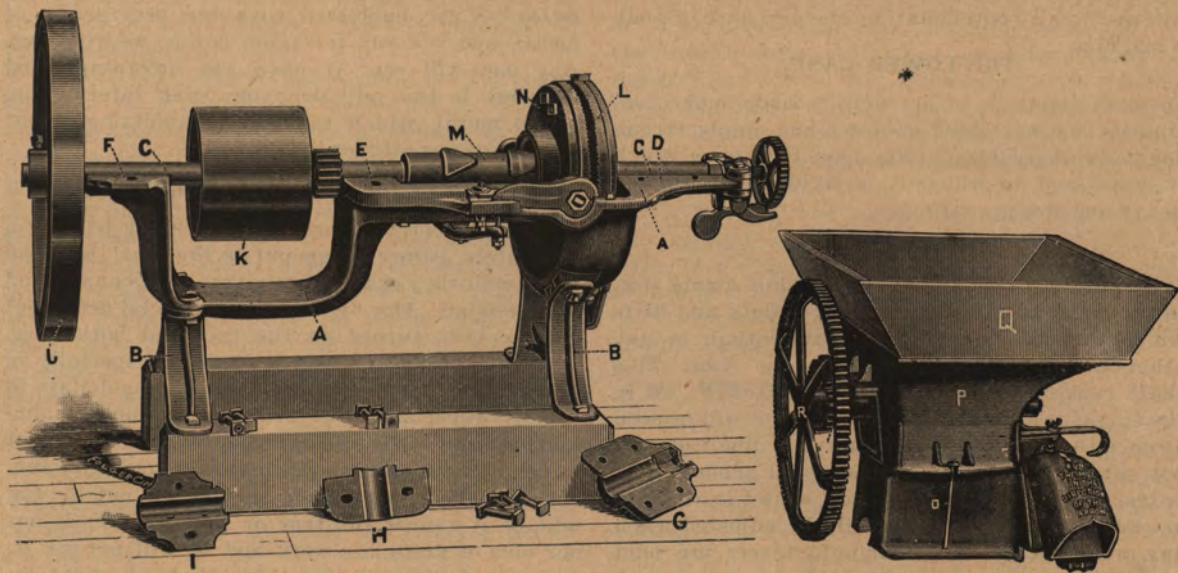
MATERIAL AND WORKMANSHIP.

We use nothing but the best material in every part of the mill, and take special pride that we never have and never will use inferior material of any kind, although it can be done, and is done, by many manufacturers at considerable saving, and could be used and not detected in a new mill. But it is our main object to produce a mill that will not

only look well when new, but that will stand for years the severe work and strain to which such machinery must necessarily be put; and as evidence of this we can refer to mills of our make which have been in constant use for years, without expense for repairs. This will be appreciated by any one familiar with machinery, AND IT SHOULD BE TAKEN INTO ACCOUNT. THE CHEAPEST GRINDING MILL IN PRICE IS NOT THE CHEAPEST IN THE LONG RUN.

We have a large factory, built especially for our use, fully equipped with special machinery for doing the work, all under the supervision of members of our own Company, so that no point in the construction of our mills is allowed to be slighted.

For better understanding of appearance and location of parts here described reference should be made to cuts on page 7, which show a mill divided at the shaft and the upper part removed so the inside can be seen. This is done by simply removing two



THE SCIENTIFIC IN DETAIL.

nuts. The ease with which the working parts of the mill can be gotten at and examined will be of interest to all contemplating the purchase of such a machine.

THE LOWER CASE,

Or main frame, A, of our mill, is made in one continuous casting, which is heavy and amply strong for the work required. The legs, B B, upon which it rests, and to which it is securely bolted, are heavy and strong castings.

THE SHAFT, C,

Is of the finest cold rolled steel, and of ample size, in each mill, to carry the largest pulleys and belts which may be desired, and heavier than in any other mills made, of corresponding sizes. This shaft runs on three long bearings, D. E. F., all in the single casting or main frame, so it will be seen at once these bearings are always in line and cannot get out of true. Journals are all made in half boxes, the upper half of each shown in cut and marked G. H. I., and can easily be adjusted when any wear occurs. Some manufacturers use solid boxes at one or more bearings. Any one the least familiar with machinery will see the fatal defect in any SOLID or NON-ADJUSTABLE BOX, and need not

be urged to avoid purchasing any such machinery as troublesome and expensive in the extreme. ALL BEARINGS are babitted with the best grade of metal, and will run for years before wearing out. Any one will see, at once, the advantage and economy in this mill over one using inferior and cheap metal, which requires rebabbiting about once a year or oftener. The

FLY WHEEL, PULLEY AND RUNNING HEAD,

J. K. L. respectively, are each carefully balanced, separately, before being put on the shaft, so when in the mill they run perfectly true, without shaking or trembling. Our fly wheel is of special design, of good weight, turned on the face and both sides. We find a heavy fly wheel is required, especially in grinding ear corn. We could save many dollars in this fly wheel alone by furnishing, as most manufacturers do with mills of this class, a light cast wheel, without any expense in turning or balancing, but the effect is at once seen when put in the mill, as it cannot run true or steady. This is not our idea of first-class work and we will not use it, although by so doing, at this and other points, we might furnish a mill to compete in price with others offered at less than we can afford to sell at

We shall continue to make a **FIRST-CLASS MILL** in every respect, and customers will surely not let any difference in price influence them to purchase an inferior machine.

The crusher or conveyor on main shaft is represented at M. The still head is shown at N. To this and the running head L, the grinding plates are bolted, as described under "Grinding Plates." O is the upper case, or casting covering the crusher and grinding plates. P is the iron hopper in which the double breakers or crushers and slide are located. (See cut page 23, and detailed description page 22.) Q is the wood hopper, of ample size to hold ear corn or any grain in quantity. R is the gear wheel which operates the double breakers. S is the pinion on shaft in which the gear wheel, R, meshes, thus giving positive motion to the breakers.

GRINDING PLATES.

We devote more space to this subject than any other connected with the mill, because it is by far the most important. In fact, the grinding plates are the very

LIFE OF ANY MILL,

And have more to do with its worth than any other part. A mill may be ever so strong and well made,

but if the grinding plates are not constructed so as to produce, from the grain, the best quality of feed; or, if they wear out after grinding 300 or 500, or even 1,000 bushels; or, if worn out plates cannot be replaced with little time or trouble, such defects make the mill of little value, even though such plates are furnished at small cost, as the expense, in a short time, will equal the first cost of the mill. We make the broad claim that our grinding plates will do **BETTER** work and **MORE OF IT** than can be done by any other mill made. And we not only make this claim, but will furnish such guarantee with each mill we make, so that this feature of our mills is equal to the other superior features upon which we pride ourselves.

RINGS AND SECTIONAL PLATES.

We make plates for T No. 1 Mill in sections (six in all, three on the running and three on the still plate), but for H No. 1, H No. 1 Geared, L No. 1 and N No. 1, they are in rings, (see cut page 11). These sections and rings are put in a machine built especially for this purpose, and ground on the back to a perfectly true and accurate bearing, and then are bolted to castings or heads, (which are first carefully balanced.) Each bolt is held in place by

nuts, each nut being securely held in place by a nut lock (of our own design and patented by us) so it cannot possibly work loose. It will thus be seen that there can be no possible danger of these nuts or bolts getting into the mill. The nut locks can easily be removed, and the bolts can be taken off, and the sections removed and replaced when worn. Each set of plates is ground alike, and when ordering extra plates our customers may be assured of receiving accurate and perfect plates, which can be put in any mill of proper size, in a short time and with little trouble, and by any one of ordinary skill and intelligence.

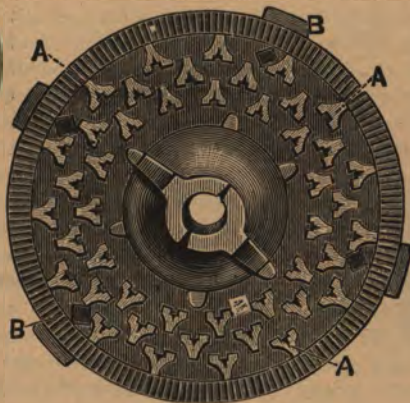
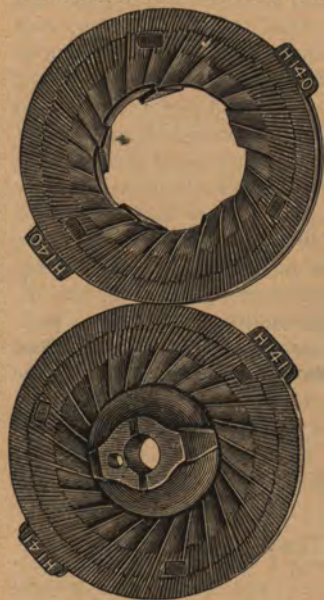
THE DRESS OF OUR PLATES

Makes them particularly valuable as to the quality of work they will do. The plan is that of gradual reduction, as will be seen by reference to cut on page 11. First, there are large ribs on the Running Plates, close around the shaft, which lack less than one-half inch of coming in contact with corresponding ribs on the Still Plate. These ribs engage the grain, small pieces of cob, etc., which have been broken by the Double Breakers, and further reduced by the crusher or conveyor on shaft, and reduce them to small, uniform pieces, so that a large per

cent. of the work, fully one-half, is done close to the shaft, within a radius of about two and one-half to three inches. Then come numerous small A-like figures, A, which stand nearly one-fourth of an inch above the surface of the plates. These have sharp edges and cut or shear the small pieces of grain, etc., as they pass from one to the other. Then comes a ring of fine reversed inclines, B B, extending entirely around the outer edge of both running and still plate. These take the grain, now reduced to small, gritty particles, and by rubbing, reduce a portion of the product to a soft, floury meal; and at this point we claim that there is no mill made that equals the "Scientific." All Iron Mills, with the common shear cut plates, can reduce the grain to the fine, gritty particles, such as our mill would produce without the

RUBBING OR FINISHING SURFACES,

But we confidently claim that there is no Iron Mill made that will produce feed with as large a proportion of soft, floury meal, as can be seen in that made by the "Scientific," which is so admired by practical feeders. We call the attention of buyers to this point, as of great value, especially as to work on ear corn, as most of the cob can be reduced



The Scientific Grinding Plates, such as used in all styles of Mills, except Style H, No. 1 and H, No. 1 Ceared. Plates in Style T, No. 1, are exactly like the above, but are in Sections, three to Running and three to Still Plate.

Grinding Plates used in our Style H, No. 1, and H, No. 1 Ceared Mills.

as fine as, or even finer than, the grain, and on oats the hulls are cut up and not merely mashed, as on other iron mills. We do not claim to reduce ALL the product to this floury meal, as we do not regard it as practicable to do so, and it is not possible to do it in any way known. But we do claim, and will guarantee, to produce a larger proportion than can be made on any other Iron Mill on the market. This we accomplish by means of the inclines, which we make of proper depth, so they will produce feed to meet the requirements of the greatest number of customers, as near as we can determine, some wanting coarse and others fine, but on the average a reasonable medium between the two. But the plates can be adapted to the requirements of any who may wish specially fine work; but such arrangement would, of course, make the quantity per hour somewhat less. Or, we can use the ordinary shear cut plates, like all others, should any desire gritty feed. We use the above style plates on all mills except our H No. 1 and H No. 1 Geared, which have plates of different dress, running in one direction only. See cut on page 11.

DURABILITY OF PLATES.

On this point we lay special stress, as of great importance and value to any one buying a mill.

The metal used is a special mixture, which produces a casting much harder than cast steel, and therefore we claim a much harder metal than is found in any other grinding plates. The A-shaped figures, to which we have referred before, standing nearly a quarter of an inch above the surface of the plates, it will be seen at once, must wear to the surface before they become useless. It will be noticed, also, that these figures are alike on both sides, and when one side is used in grinding, the other side remains untouched, so when one side becomes worn the mill can be run in the opposite direction, which is merely done by crossing the belt, changing the spout and gear wheel, (**the only mill on which this can be done without making some change on the inside of the mill,**) and the other side of the figures, which are not worn in the least, is used, thus furnishing a fresh, new surface; and, as these are used, the action of the grain sharpens the dull side, and thus the plates are

SELF SHARPENING,

And by using a little care, and reversing the mill every 500 bushels or so, thousands of bushels of grain can easily be ground on each set of plates. We have numerous customers who have ground

10,000 bushels and over on one set of plates. So, if operated as above, we cheerfully guarantee from two to four times as many bushels on each set of plates as can be ground on plates of ANY OTHER MILL on the market.

SQUARE INCHES OF SURFACE

In grinding plates is an item of GREATEST VALUE in determining their capacity and practical usefulness. We would not refer to this matter at so great length except to correct any false impression that may have been made by the claims of certain manufacturers, who make mills with four grinding surfaces, claiming they can do as much work with two sets of their plates, (or four grinding surfaces), say, nine inches diameter, as can be done on any mill with one set of plates, (or two grinding surfaces), say, 18 inches diameter, with less power, "other things being equal." We think we can show that such claims cannot be maintained, either in theory or practice, and will produce the evidence, etc., so any one can figure for themselves, and not accept incorrect statements, whether made intentionally or through ignorance. In the first place, "other things being equal," this would be impossible; because the two sets of plates,

or four grinding surfaces, do not contain the SQUARE INCHES OF SURFACE to equal the capacity of the ONE SET, which can be proved by the following rule and figures, viz: "The area of a circle equals the square of the diameter multiplied by .7854." And the figures show as follows:

The diameter of the circle being eighteen



Cut Representing one 18 Inch Circle.

inches, its square is $18 \times 18 = 324$, which, multiplied by .7854 = 254.46, or the number of square inches in

ONE 18 INCH CIRCLE. Multiply this by 2 and we have 508.92, or the number of square inches of surface in TWO 18 INCH CIRCLES, or, say grinding plates.

The diameter of the circle being 9 inches, its square will be $9 \times 9 = 81$, this multiplied by .7854 = 63.61, or number of square inches in ONE 9 INCH CIRCLE. Multiply this by 4 and we have 254.45, or number of square inches of surface in FOUR 9 INCH CIRCLES, or, say grinding plates, or, **exactly twice the area or square inches of surface in TWO 18 INCH CIRCLES as there are in FOUR 9 INCH CIRCLES.**



Cut Representing One
9 Inch Circle.

This is figuring on the supposition that all surfaces are **solid**, but it is well known that grinding plates in mills are not solid. All have openings, at least, for the shaft. Any mill using four grinding surfaces must, for obvious reasons, have openings much larger, and in nine inch plates it will be found that such opening is 5 inches in one plate and $4\frac{1}{2}$ in two, allowing for whatever grinding surface **it may be claimed** is on the spokes of wheel forming two of the plates. One wheel we allow as solid, although it would be fair to figure out, at least, a four inch

opening. In a set of "Scientific" plates the opening in both running and still plate is practically no more than the size of shaft. It is actually so in the running plate, and while in the still plate, taken alone, there is an opening of five inches, when it is put in mill, with the running plate, this opening fits closely to the form of the running head and plate, which curves gradually from the hub toward the circumference, and the lugs or projections on the curves of the still plate actually perform the office of grinding as the grain comes in contact with them and corresponding lugs on the curves of the running plate. But that we may be perfectly fair in our figures, we will deduct this opening of five inches in our still plate, and we then find, deducting this and the openings above referred to.

THAT ONE SET OF OUR 18-INCH PLATES, WITH TWO GRINDING SURFACES, HAS 489.29 SQUARE INCHES OF SURFACE, WHILE THE TWO SETS OF 9-INCH PLATES, OR FOUR GRINDING SURFACES, HAVE 203.41 SQUARE INCHES, OR 285.93 SQUARE INCHES LESS.

To make the case still stronger for the "Scientific," it can be shown that ONE SET OF OUR 12-INCH PLATES, with two grinding surfaces, allowing for openings, has 3.14 square inches of surface **more than** TWO SETS OF 9-INCH PLATES, or four grinding sur-

faces, contain. All this proves, and, we think, conclusively, the incorrectness of the claim referred to as to capacity.

IT ALSO PROVES THE CLAIM WE MAKE,

Which has been demonstrated in actual practice, and can be demonstrated at any time, in the practical working of the mill itself, and which we further guarantee, viz: that one of our mills with

ONE SET OF 12-INCH PLATES, OR TWO GRINDING SURFACES, WITH EQUAL POWER, WILL ACTUALLY PERFORM AN EQUAL AMOUNT OF WORK WITH ANY MILL USING TWO SETS OF 9-INCH PLATES, OR FOUR GRINDING SURFACES, AND OF A MUCH SUPERIOR QUALITY, as could be illustrated by photographs, showing the actual work of our mill as compared with others. But the difference in favor of the "Scientific" is so marked we might be accused of taking fine feed from our pile and coarse from our competitor's, especially if they were not invited and allowed to prepare their samples. This is so because of the greater number of inches of grinding surface coming in contact with the grain at each revolution of the plates, so the grain is retained in the plates longer than in the 9-inch plates; and its reduction is not so hurried, as the "gradual

reduction" feature of our plates greatly assists in easily producing the above result. We further will guarantee to any customer that **one set of our 12-inch plates**, or two grinding surfaces, will grind **four times** as many bushels of grain as can be ground on **two sets of 9-inch plates**, or four grinding surfaces, of any manufacutre. So, in buying, compare price of our mill, having **one set of 12-inch plates**, or two grinding surfaces, with other mills having **two sets of 9-inch plates**, or four grinding surfaces, cost of grinding plates, guaranteed capacity, work to do, etc.

In these figures and remarks we have given the 9-inch plates, or four grinding surfaces, the benefit of the supposition that both sets of plates, or all the surfaces, would do an equal amount of grinding, which can readily be shown is **absolutely impossible**, unless the grain were fed to each set alike, which is not done, as two of the grinding surfaces are attached to a wheel which revolves between the other two surfaces. The spokes on this wheel must prevent grain from passing freely through to the second set of plates. Some idea of the extent to which this is done can be gained by attempting to throw grain or other particles through a rapidly revolving pulley or wheel. **Only a small portion will pass between the spokes.**

Increase the velocity of the pulley or wheel to, say one thousand revolutions per minute, (as is the ordinary speed of grinding mills), and the result can be imagined, and the illustration readily applied to a grinding mill. This, again, is giving the two sets of plates, or four grinding surfaces, the benefit of the supposition that there is nothing further to interfere with the two sets doing an equal amount of work. The fact is, in the case in question, ONE OF THE TWO SETS OF PLATES, OR TWO OF THE GRINDING SURFACES, ARE USED IN REGULATING THE GRINDING, AND IN SUCH CAPACITY ARE IN ACTUAL CONTACT, ONE METAL SURFACE AGAINST THE OTHER, MUCH OF THE TIME, at least, and therefore the work done on both sets cannot be equal. So the case looks EXTREMELY SERIOUS for the two sets of plates, or four grinding surfaces, compared with the one set.

Careful tests and comparisons enable us to say that one set, or two of the grinding surfaces, does from 75 to 90 per cent. of the grinding, so the arrangement of plates under discussion, furnishing a mill PRACTICALLY of but LITTLE GREATER CAPACITY than any mill with single set of nine inch plates. It is but fair to state that all mills using two sets of plates, or four grinding surfaces, do not

feed the grain to them as described above. Other devices for this, as well as regulating the grinding, have been used in mills having four grinding surfaces, which have been made and used at various times since 1850. The principle of mills with four grinding surfaces is by no means new, but has been known to the trade for years. Do not be misled by mills using old devices, put in new form, with loud claims of originality.

Another point to be observed between small plates and large ones is

THE POWER REQUIRED

to do work rapidly and well. No sensible farmer desiring to sharpen an axe or tool would select a small stone to do the work, nor would he be satisfied if two small ones were offered him, but would select a large one, knowing that the increased grinding surface on the large wheel would enable him to do the work in less time with less labor, and do it better than it could be done on small ones. The same principle applies to grinding mills, and will be apparent to any intelligent person, and we are prepared to GUARANTEE MORE WORK AND BETTER WORK ON OUR MILL, WITH EQUAL POWER, THAN CAN BE DONE ON ANY MILL MADE, and are willing to

place them in competition with any other in the hands of any intending purchaser, he to keep the mill doing the most and best work.

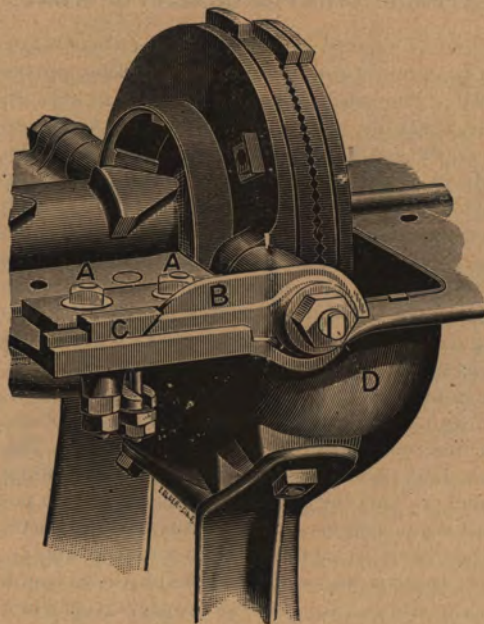
ADJUSTMENT OF PLATES.

We have made marked improvement at this point over our previous arrangement for adjusting the still plate with respect to the running plate. The still plate is hung on two steel bolts, one at either side. One side is stationary, while the other, D, page 18, is adjustable by means of a casting, B, held firmly in place by bolts, A A, but can be moved back and forth, so as to bring the still plate in proper adjustment to the running plate. A small iron wedge bolt, C, is used at end of casting for the double purpose of taking any strain from the casting and for convenience in adjusting. The plates adjust themselves at top and bottom. The simplicity of the mill at this point must impress the buyer favorably, as when changing plates, the mill can be taken apart and plates removed, new ones put in and easily adjusted as well as when the mill left the factory. We believe our mill is vastly superior to others at this point, and we invite detailed comparison.

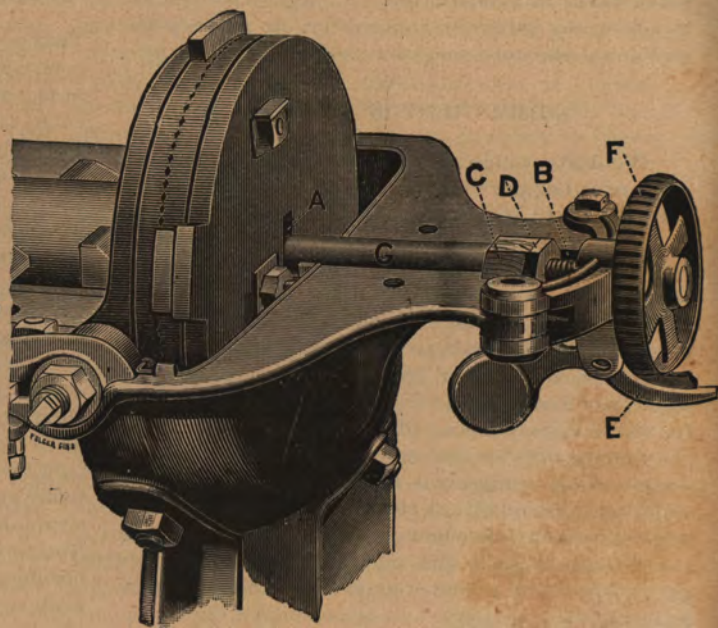
REGULATING PLATES FOR QUALITY OF WORK,

That is, fine or coarse grinding. The cuts already referred to show arrangement of our grinding plates in the mill. The running head and plate is attached to the shaft by means of a steel pin, A, driven through it, extending one-half inch on either side, which fits in a mortise made in the hub of running head. At the other side of hub is a tenon, which fits in a corresponding tenon in end of crusher, so the plate is held securely to the shaft and revolves with it. To adjust the plates for fine or coarse grinding, we use a temper screw, B, which works directly against an anti-friction block, C, which does not revolve, but with which the end of shaft, G, comes in contact. By tightening the temper screw, the running plate is moved toward the still plate, until the desired quality of work is produced. The lock lever, E, is then allowed to engage the notched hand wheel, F, and the plates are held firmly in position, but when released they naturally separate. Nor do they come in contact when running empty, nor does it become necessary for the plates to touch each other, which fact will be appreciated when wear of plates is considered.

This, it will be seen, is an easy, simple and



ADJUSTING DEVICE.



REGULATING DEVICE.

really the **most natural** way to regulate the grinding, as there is nothing to prevent the easy motion of the shaft and plate back and forth, and all the strain of grinding is taken at a point where no damage can be done, as the bearing at end of shaft is arranged to retain oil, and the shaft at that point runs constantly in oil, and whatever wear there may be is on the anti-friction block, which, when worn out, can be replaced for a trifle, and in a moment's time, without disturbing the mill, as the journal is in half box at this point. **If solid, as in some mills**, it would be very serious. We have given this particular subject much study, and examined carefully every device for such purpose we could find, and are convinced that this principle is the only **really practical, economical and reliable** one in use.

PRACTICAL, because it is and has been universally used for years, although, as in other fields of invention, new devices have been attempted and abandoned.

ECONOMICAL, because the strain and wear are taken at a point which has no vital bearing on the mill, while other known devices take such strain and wear upon the **GRINDING PLATES**, which are the **LIFE** of any mill; and at a point where the **TEARING and DESTROYING** force is greatest.

RELIABLE, because there is nothing to prevent the easy motion of the running plate toward or away from the still plate, and nothing obstructs it except the resistance of the grain being ground. While other known devices, having this resistance com-

mon to all, have also the added resistance of a plate on a peculiar bearing, (without means of oiling), moving laterally on a rapidly revolving shaft, so that dust from grinding, heat from friction and absence of oil are liable to make such device inoperative.

We submit this feature of the "Scientific" to the candid consideration of practical men, and do not doubt a decision in our favor.

THE CRUSHER

On the shaft has lugs which are amply strong to do the work without danger of breakage. These lugs have angles, which, in addition to breaking the cobs, give the crusher the nature of a conveyor, so grain and broken cobs are carried to the grinding plates. This is held securely in position on the shaft by a novel device, which enables us to dispense entirely with set screws, keyseat or pins inside the mill, and ours is the only mill in which this is accomplished without the use of one or more of these means, all of which have objections. A bolt or set screw is liable to work loose and get into the plates and cause breakage. A keyseat or pin makes it difficult to remove the crusher when taking mill apart to renew plates or for other purposes; but with our device we avoid any possibility of accident from such cause, and the crusher can easily be removed when desired.

But, while we take every precaution to guard against accidents, it will happen, occasionally, that pieces of iron, or other dangerous material, will, in some way, get into the grain, and, unobserved, get into the mill; and, unless some provision is made to avoid it, accidents are bound to occur. To prevent them we have heretofore used our

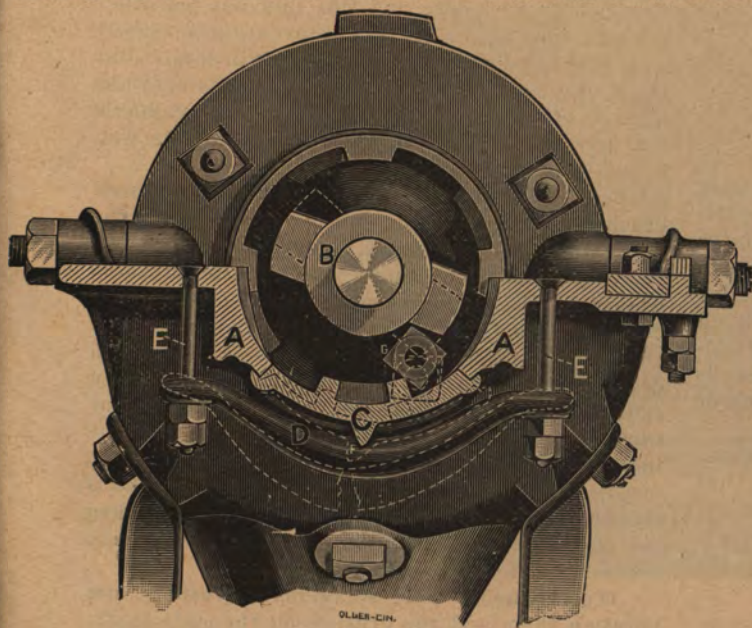
PIN BREAKER,

Which consists of a wooden pin, A, shown in cut on page 21, holding one side of a yoke, B, which holds the temper screw, C, that regulates the feed. Any hard substance, as a nail or spike, shown at D, coming between the plates, will break this pin, the yoke and screw will be thrown to one side, as shown by dotted lines, thus relieving the pressure on plates, which will separate as shown, and nail or other article will drop below and can be removed at lower spout. A new pin can be put in the yoke and the mill is again ready for work. This device has proved very efficient, and we could refer to numerous instances where accidents have been averted, which otherwise would have made a complete wreck of the mill. It will sometimes happen, however, that pieces of iron will get into a mill too large to work through the crusher box to the plates, so that

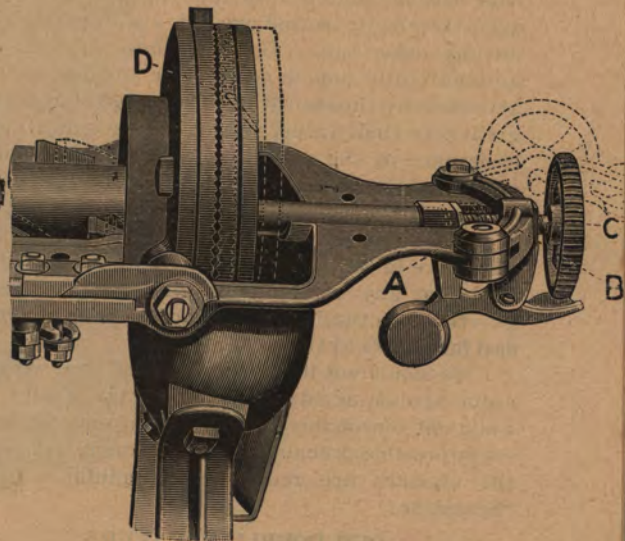
before the pin breaker gets an opportunity to act the damage is done. To prevent accidents of this kind, we have adopted our

SAFETY BOTTOM,

Which is our own device, used only on our mills. The cut, page 21, will show that the lower case, or main frame, A A, is cast without any bottom. At the point directly under the crusher, B, on the shaft, we make a separate casting, or bottom, C, which fits closely and tightly in the space left in the lower case; and this is held in place by a bar, or lever, D, hung at each end on bolts, E E. These bolts are drawn up so that the bar holds the casting, or bottom, firmly in place. This bar is sufficiently strong for all kinds of grinding, or any legitimate work, but should any piece of iron, or other substance, as shown at G, too hard to grind, get into the mill, it will cause the bar to break at the point, F, where it bears against the bottom, (as that is the weakest point), when the casting, or bottom, will fall out, as shown by dotted lines. No damage is done to the mill, and the casting can be replaced in a moment by using another bar, a number of which we furnish with each mill. We cannot place too much stress upon the **great value** of these two features—



SAFETY BOTTOM.



PIN BREAKER.

PIN BREAKER AND SAFETY BOTTOM.

But any one wishing to buy a mill will see at once that any mill, no difference how cheap, would be dear without such practical devices, both of which are patented by us, and are not, and cannot be used on any other mill. Both of these devices work automatically, and do not require any assistance or attention by the operator. This consideration adds greatly to their value, as any device requiring the assistance of the operator, in throwing the plates apart, cannot be practical. If our mill had no other points of superiority, these two would surely give it the preference over others, even though it should cost more in the start; especially when it is considered that any instance, in which an accident is averted, is actually the **saving of the price of a mill or cost for repairs** to the owner.

We would not have it understood that we guarantee against accidents in running machinery, that could not reasonably be done by any one, but we use every possible precaution against them, and believe the chances are reduced to a minimum in the "Scientific."

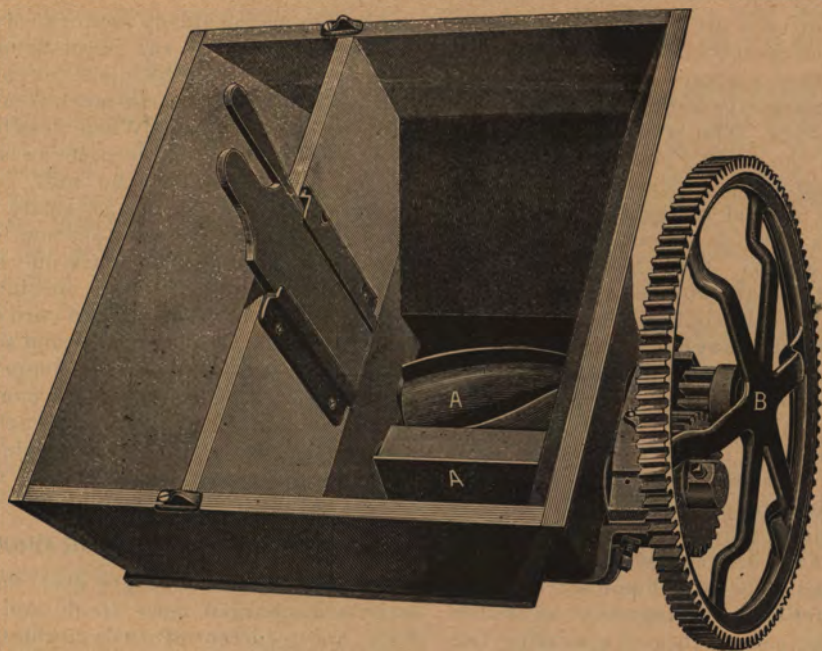
OUR DOUBLE BREAKERS,

As shown in cut, on page 23, we regard as probably

the most practical and valuable device ever used on a cob or feed mill, and this fact has led other manufacturers to boldly use our invention, as closely as it could be done without copying it in detail. But while other concerns have copied our device, their mills, in other respects, lack the peculiarly valuable features which give to the "Scientific" its well known superiority.

Our Double Breakers consist of two intergeared crushers, A A, receiving motion direct from the main shaft, by gear wheel, B, causing them to revolve towards each other. One of these crushers has spiral ribs, the other straight, both having the cutting edges. One of the crushers revolves faster than the other, so the action on the ears is both crushing and cutting, but as the edges of one crusher do not come in contact with the other, nor work against an intermediate bar, there is no wearing action to dull them and make them ineffective, nor do they require any close adjustment. **This is the only practical device in use for crushing and grinding ear corn with shucks on**, doing the work effectively without excessive wear to the crushers.

Directly under these breakers, or crushers, and between them and the crusher on the main shaft, is a large slide, which can be moved back and



DOUBLE BREAKERS.

forth. The ears of corn are thrown, or shoveled, into the hopper, and upon the Double Breakers, **the entire length** of which engages the ears, keeping them in constant motion, or agitation, so they cannot clog or bridge over. The broken pieces of cobs and grain pass to the crusher on the main shaft, where they are still further reduced and conveyed to the plates to be ground to the desired fineness. The large slide, is used to regulate amount of crushed cobs to be ground. It can be closed entirely and the supply to the plates stopped, even while the hopper is full and the mill continues to run; or any quantity, as the operator may desire, can be allowed to pass to the plates, by opening the slide, until the quantity and quality of work equal the power used, or may suit the operator. When changing from ear corn to oats, shelled corn, or any small grain, they are put into the hopper the same as ear corn, and the quantity to be ground regulated by a small slide, which is in, and a part of, the long slide. The large slide is held in any desired position by a ratchet pawl, and the small slide by a thumb screw. This device, and our particular arrangement of Double Breakers, make the convenience of operating the mill greater than in any similar mill on the market, as any and all kinds of small grain can be ground,

and a regular and steady flow of feed secured to the plates, even though the grain be uncleaned, containing straw, corn silks, pieces of cob, etc.; which, in other mills, would cause much trouble and annoyance in clogging up. When desiring to change from small grain to ear corn, it can be done without stopping or changing the mill. **Ear corn with shucks on** can be ground as easily as with the shucks off, but the quantity per hour will not be so great. We claim ours to be the only mill made that does this work without some special attachment; and upon which new or frozen corn can be ground as easily as dry, only, of course, not so rapidly.

We have a partition in the hopper so that ear corn and oats or any other grain can be ground at same time, and the proportion of each to be ground regulated as desired. A very simple and practical arrangement, easily adjusted, and no extra machinery necessary in operating it.

HIGH DISCHARGE FOR THE GROUND FEED,

We believe, has advantages over the low, as the meal is discharged more freely and with greater force, and a current of air is circulated through it as it is discharged from the mill, so we prefer to discharge at this point; but we are aware that a

few persons prefer the low discharge and we make our mills so either can be used, also that it may discharge on either side desired.

Considering all these things, we think we are justified in claiming that ours is **the best mill on earth**, and we speak positively, because we have made the subject our special study for years, and have spent more time and money in making experiments and improvements than any manufacturer in the country.

There are more "Scientific" mills at work to-day grinding ear corn than of all other makes combined.

We call attention to the different styles and sizes of mills which we make, and show in the following pages, stating size, price and capacity of each. We show all of our mills with the pulleys resting between two bearings, and we believe the mill runs lighter in this way, as there is no great strain on either bearing, as is the case with an over-hanging pulley; but if customer desires we can furnish over-hanging pulleys with any of the mills.

CAPACITY.

Our estimates of the capacity of the "Scientific" mills are on moderately coarse grinding, and from

actual tests made by ourselves grinding old, dry corn. Corn in February and March will grind nearly one-third faster than it will in October and November.

Our long experience in making and selling mills has shown us that the ideas of different men vary greatly as to what constitutes feed. Some believe (as we do) that the best feed is that ground a little finer than rice grains, while a few want very fine meal. This being the fact, and owing also to the different conditions of corn, changes in weather, speed at which the mill is run, etc., we find it impossible to guarantee that any definite work can be done, unless we know all the conditions under which the mill is to run and kinds of grain to be ground. But we will **guarantee**, with equal power, speed, etc., to do more work on any kind of grain, and of better quality, than can be done on any iron mill on the market; and our grinding plates will do from two to four times as much work. All this is based upon the results gained from actual tests, and we cheerfully put such guarantee on any and all of our mills.

The Scientific, Style H, No. 1,

Has our Double Breakers, with partition, shown on page 23, Pin Breaker, on page 21, and Safety Bottom, on page 21, as well as all other improvements described and illustrated. It grinds ear corn with or without shucks on, shelled corn, oats, rye, barley, cheat, screenings, or, in fact, any and all kinds of small grain separately, or any two or more mixed, for feed.

Dimensions and Weight.—3 feet 10 inches long, 2 feet 8 inches wide, and 3 feet 7 inches high. Weight of mill, 508 pounds; weight of fly wheel, 40 pounds.

Shaft.—1½ inches in diameter: cold rolled steel

Grinding Plates.—10 inches in diameter. These plates are unlike those in our other mills, and run **only in one direction**, to the right, but can furnish left hand plates if so ordered. We furnish an extra

set free in this style of mill, but in no other, as all others are reversible. Extra plates, per set, \$2.00.

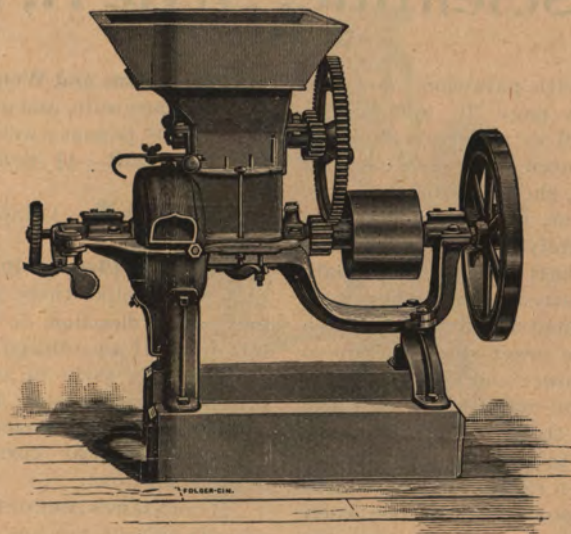
Power.—4 to 8 horses to sweep power, or 4 to 6 horse steam power.

Pulley.—We furnish an 8 inch diameter, 6½ inch face pulley, unless special size is ordered, which can be furnished with mill without extra charge.

Speed.—800 to 1,000 revolutions per minute for horses, and 1,000 to 1,200 revolutions per minute for steam power.

Capacity.—Ear corn with shucks on, 5 to 10 bushels per hour; with shucks off, 8 to 18 bushels. If corn is new, wet or frozen, the work can be done equally as well but not so fast. Shelled corn, 8 to 20 bushels per hour. All kinds of small grains separately, or corn and oats or other grains mixed, 6 to 15 bushels per hour. (See page 25.)

Price of H, No. 1, complete with extra set plates, on cars here, \$60.00.



STYLE H, NO. 1 MILL.

The Scientific, Style H, No. 1, (CEARED.)

Has our Double Breakers, with partition, shown on page 23, Pin Breaker, on page 21, and Safety Bottom, on page 21, as well as all other improvements described and illustrated. It grinds ear corn with or without shucks on, shelled corn, oats, rye, barley, cheat, screenings, or, in fact, any and all kinds of small grain separately, or any two or more mixed, for feed. It has a shaft directly under main shaft of mill, which is supported on ample bearings, and carries a large gear wheel which meshes into a pinion on main shaft. The lower shaft is coupled direct to tumbling rod of power and the large gear wheel imparts motion to the main shaft, the speed of which is increased four times to one of the rod, and this speed is sufficient to properly operate the mill. This gear wheel has a ratchet clutch in hub so that when stopping the power the mill continues to revolve, but the sweeps do not run onto the teams. In connection with this mill we make a power especially strong and heavy, which is superior to other powers for such work.

Price of H, No. 1, complete with extra set plates, on cars here, \$70.00.

Dimensions and Weight.—3 feet 10 inches long, 2 feet 8 inches wide, and 3 feet 7 inches high. Weight of mill, 508 pounds; weight of fly wheel, 40 pounds.

Main Shaft.—1½ inches in diameter; cold rolled steel.

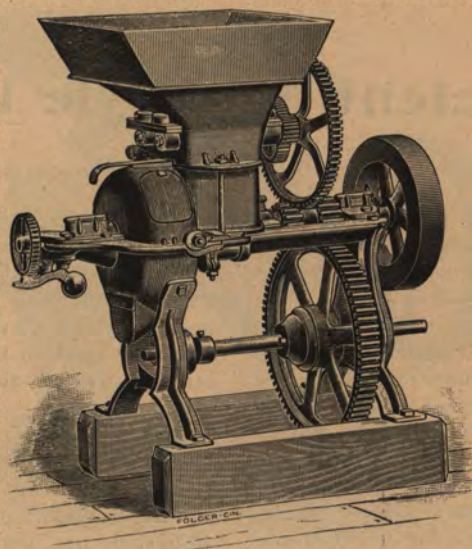
Lower Shaft.—1½ inches in diameter; cold rolled steel.

Grinding Plates.—10 inches in diameter. These plates are unlike those in our other mills, and run **only in one direction**, to the right, but can furnish left hand if so ordered. We furnish an extra set free in this style of mill, but in no other, as all others are reversible. Extra plates, per set, \$2.00.

Power.—4 to 8 horses to sweep power.

Capacity.—Ear corn, with shucks off, 8 to 18 bushels per hour.

If corn is new, wet or frozen, the work can be done equally as well, but not so fast. Shelled corn, 8 to 20 bushels per hour. All kinds of small grains separately, or corn and oats or other grains mixed, 6 to 15 bushels per hour. (See page 25.)



STYLE H, NO. 1 GEARED MILL.

The Scientific, Style L, No. 1.

Has our Double Breakers, with partition, shown on page 23, Pin Breaker, on page 21, Safety Bottom, on page 21, as well as all other improvements described and illustrated. It grinds ear corn with or without shucks on, shelled corn, oats, rye, barley, cheat, screenings, or, in fact, any and all kinds of small grain separately, or any two or more mixed, for feed.

Dimensions and Weight.—4 feet 2 inches long, 2 feet 3 inches wide, and 3 feet 2 inches high. Weight of mill, 560 pounds; weight of fly wheel, 55 pounds.

Shaft.—1½ inch; cold rolled steel.

Grinding Plates.—12 inches in diameter, having all the advantages referred to in our description of plates, and same as shown on page 11. Are reversible and self-sharpening. Price of extra plates, \$4.00.

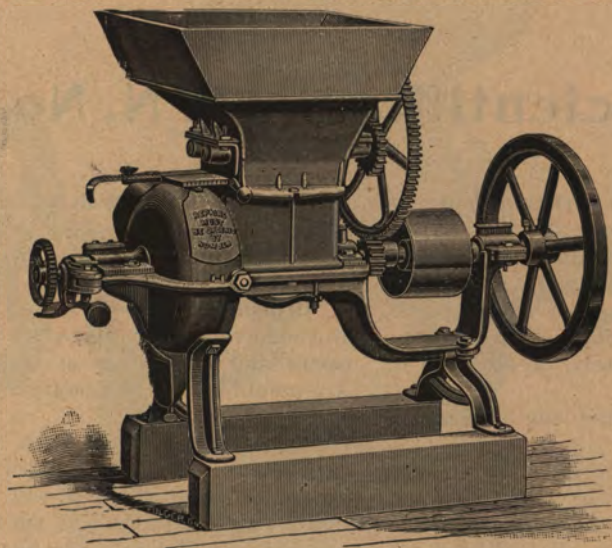
Power.—8 to 12 horses to sweep power, 6 to 10 horse steam power.

Pulley.—We put on mill a pulley 8 inches in diameter, 6½ inch face, but can furnish larger, if desired, without extra charge.

Speed.—1,000 or 1,200 revolutions per minute for steam power; 800 to 1,000 revolutions per minute for horse power.

Capacity.—Ear corn with shucks on, 10 to 20 bushels per hour; with shucks off, 15 to 30 bushels. If corn is new, wet or frozen, the work can be done equally as well, but not so fast. Shelled corn, 25 to 40 bushels per hour. All other small grains separately, or corn and oats or other grains mixed, 15 to 30 bushels per hour. (See page 25.)

Price of L, No 1, complete, on cars here, \$65.00.



STYLE L, NO. 1 MILL.

The Scientific, Style N, No. 1,

Has our Double Breakers, with partition, shown on page 23, Pin Breaker, on page 21, and Safety Bottom, on page 21, as well as all other improvements described and illustrated. It grinds ear corn, with or without shucks, and shelled corn, oats, rye, barley, cheat, screenings, or, in fact, any and all kinds of grain separately, or any two or more mixed, for feed.

Size of Shaft.—4 feet 9 inches long by $1\frac{1}{4}$ inches in diameter, cold rolled steel.

Power Required.—10 to 15 horse steam power.

Speed.—900 to 1,000 revolutions per minute.

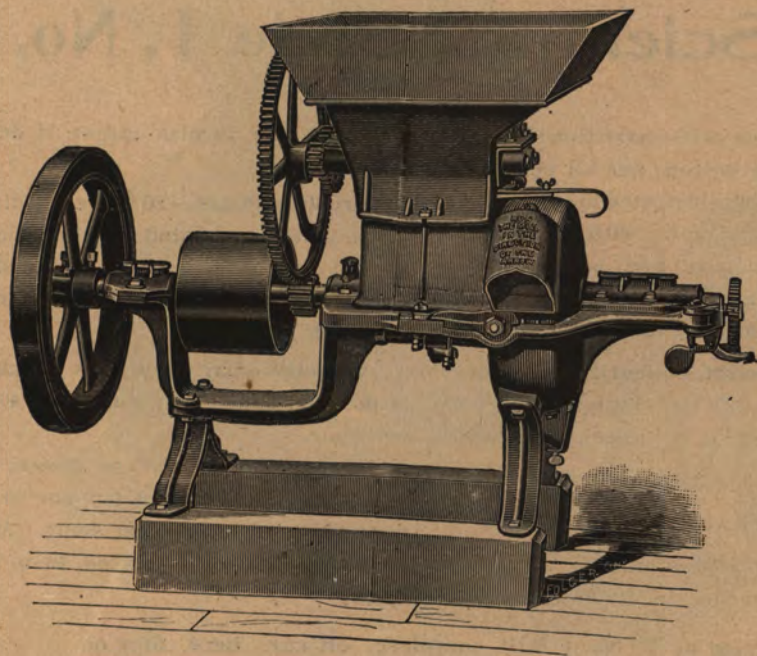
Pulleys.—Unless otherwise ordered we put on this mill a pulley 10 inches in diameter, $8\frac{1}{2}$ inch face, but can furnish any size up to and including 14 inches in diameter, $8\frac{1}{2}$ inch face, without extra charge.

Dimensions and Weight.—4 feet 9 inches long, 2 feet 5 inches wide, and 3 feet 5 inches high. Weight of mill 625 pounds; weight of fly wheel, 100 pounds.

Grinding Plates.—14 inches in diameter, having all the advantages referred to in our description of plates, and same dress as rings shown on page 11. Are reversible and self-sharpening. Price of extra plates, per set, \$5.00.

Capacity.—Ear corn with shucks on, 15 to 25 bushels per hour; with shucks off, 20 to 50 bushels per hour. If corn is new, wet or frozen, the work can be done equally as well, but not so fast. Shelled corn, 20 to 65 bushels per hour. All other small grains, separately or mixed, 20 to 60 bushels per hour. (See page 25.)

Price of N, No. 1 Mill, complete, on cars here, \$80.00.



STYLE N, NO. 1, MILL.

The Scientific, Style T, No. 1,

Has our Double Breakers, with partition Hopper, Pin Breaker and Safety Bottom, and all other improvements described and illustrated in our 72 page catalogue. It grinds ear corn, with or without shucks on, shelled corn, oats, rye, barley, cheat, screenings, or, in fact, any and all kinds of grain separately, or any two or more mixed, for feed.

Dimensions and Weight.—6 feet 2 inches long, 3 feet 3 inches wide, and 5 feet high. Weight of mill, 1,400 pounds; weight of fly wheel, 150 pounds.

Power Required.—15 to 25 horse steam power.

Speed.—800 to 1,000 revolutions per minute.

Pulleys.—Unless otherwise ordered, we put on this mill a pulley 14 inches in diameter, 8½ inch

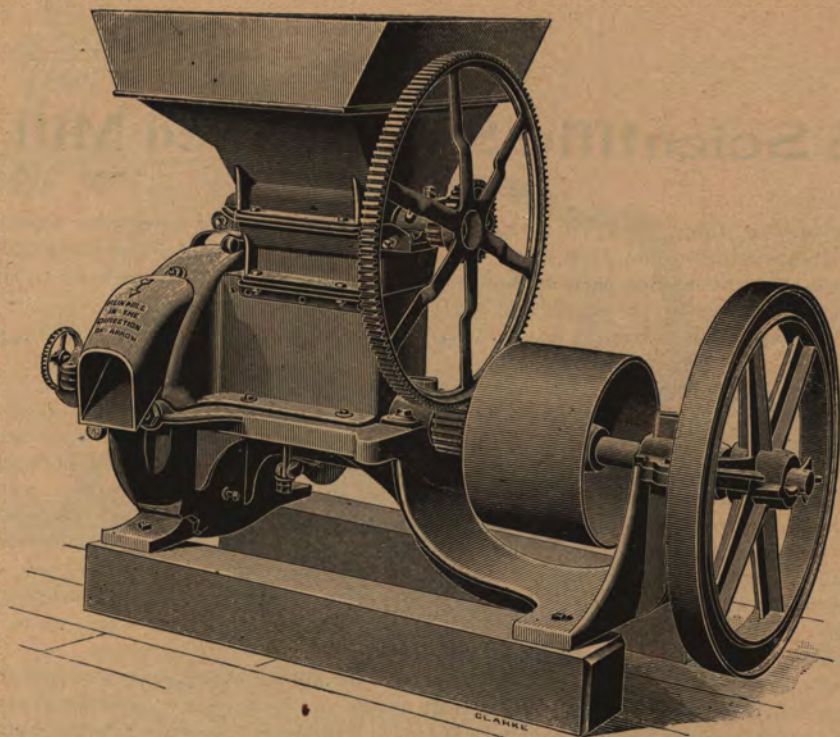
face, but can furnish larger, if desired, without extra charge.

Grinding Plates.—20 inches in diameter, of extremely hard metal and very durable. Are reversible and self-sharpening, having double the capacity of non-reversible plates. Price of extra plates, per set, \$6.00.

Capacity.—Ear corn with shucks on, 25 to 40 bushels per hour; with shucks off, 40 to 75 bushels per hour.

If corn is new, wet, or frozen, the work can be done equally as well but not so fast. Shelled corn, 50 to 90 bushels per hour. All other small grains, separately or mixed, 40 to 75 bushels per hour.

Price of T, No. 1 Mill, complete, on cars here, \$135.00.



STYLE T, NO. 1 MILL,

The Scientific Sweep Feed Mill

Grinds ear corn, new, dry or damp; shelled corn, alone or mixed with other grain for chop feed, oats, etc., and is so arranged that the **interior parts of the Mill** revolve with the revolutions of the team and the power is applied directly to the grinding parts, thereby making the draft very light.

Consider this point, as it is a vital one in such a mill, and with other special features makes the "Scientific" superior to others.

It is extremely simple, having no cog gearing or complicated machinery to get out of order, and any one who can drive a team can readily operate it, as it is only necessary to set it in place, hitch the team to it, put in grain and grind away, the quality of work being easily and quickly regulated while the team is in motion.

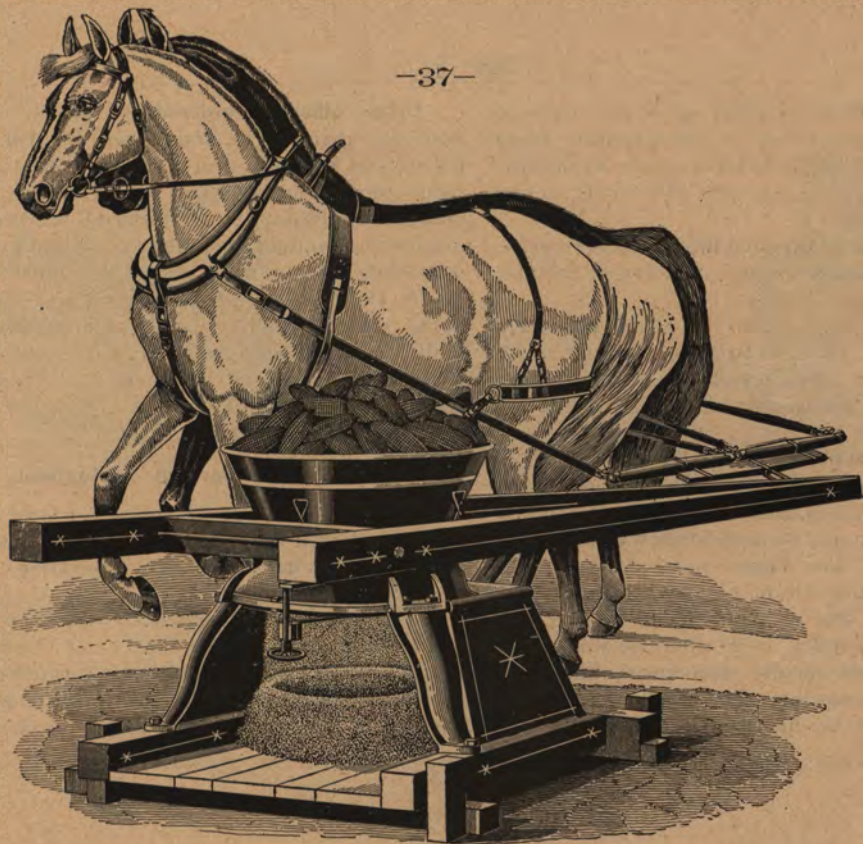
Our device for breaking cobs has no equal on any mill of this class. We do the work quickly and thoroughly, breaking, cutting and crushing the cobs into very small pieces before they get to the grinding rings.

Our Grinding Rings or Burrs have a peculiar dress by means of which the broken pieces of cobs and whole grains are gradually reduced to the fineness desired, so that we produce a

BETTER QUALITY OF FEED AND WITH LESS WORK TO THE TEAM

Than can be done on other similar mills. This breaking device, in connection with our grinding rings, enables us to **grind new ear corn** just husked from the shock, as well as damp or wet corn, and we believe ours is the only one that will do the work successfully. This is a **valuable item**, as new corn can be used early when there is a scarcity of the old, and when most of the crop is poor and damp, as for two seasons past, all can be saved and utilized as profitable feed.

Our Mill will not choke, either on new or old corn, wet or dry, nor on any other kind of grain, and does not give trouble or annoyance to the user from any other cause.



It is very durable, there being no boxes, journals or other parts to wear, except the grinding rings which are made from a special grade of metal, extremely hard, and each set will grind large quantities of grain.

We make two sets of Grinding Rings, one for coarse and one for fine grinding. The capacity of the fine grinders is:

Corn in the ear	12 to 15 bu. feed per hour.
Shelled Corn.....	15 to 20 bu. feed per hour.
Corn and Oats (chop feed) ..	8 to 12 bu. feed per hour.

To grind very fine the amounts will, of course, be reduced.

With the coarse plates in mill we can grind :

Ear Corn, dry or damp, coarse,	15 to 25 bu. feed per hour.
Shelled Corn	20 to 20 bu. feed per hour.

Coarse plates should be used for new or wet corn.

These amounts are based upon actual work done by ourselves and others, but bear in mind that condition of grain, size of team, speed at which it is driven, etc., have much to do with the work produced, so we would hardly guarantee anything definite without knowing the conditions under which the mill will be operated.

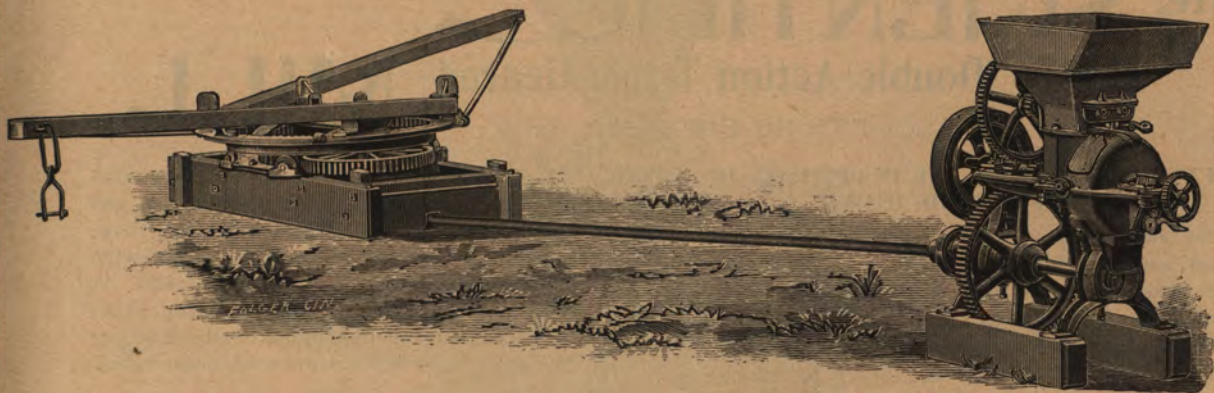
Unless otherwise ordered we always ship mills with fine grinders in, and do not furnish any extra set except when so ordered, and at the additional price named below. The fine grinders furnish a complete mill, capable of doing all kinds of work in a superior manner, grinding corn and cob, shelled corn, oats, etc., equally well. But most customers prefer the coarse plates also, so they can do more rapid work when desiring to grind coarse, and the additional cost being so little, we recommend both. Price of mill, complete with one set of plates..\$35 00
Extra Grinders, additional..... 4 00
Platform, additional..... 1 00

Free on Board Cars at Springfield, Ohio.

The platform can be omitted where customers wish to set mill on floor, or they can be made very easy if parties have the lumber and time convenient to do the work.

When ordering always state plainly which style of grinders are to go in mill, and if extra set is wanted, and whether platform is wanted or not.

We will sell mills on trial to any responsible party, and guarantee all we claim for them.



MILL AND POWER.

The above cut shows our H, No. 1 Geared Mill attached to Power ready for operation. As explained in our description of Power this outfit is without an equal for grinding all kinds of grain. A clamp pulley can be attached to fly wheel of mill, from which a sheller or feed cutter can be operated at the same time grinding is being done.

We can furnish the Outfit, complete on board cars here, for \$150.00.

The SCIENTIFIC

Double-Action Triple-Geared MILL.

SOMETHING ENTIRELY NEW.

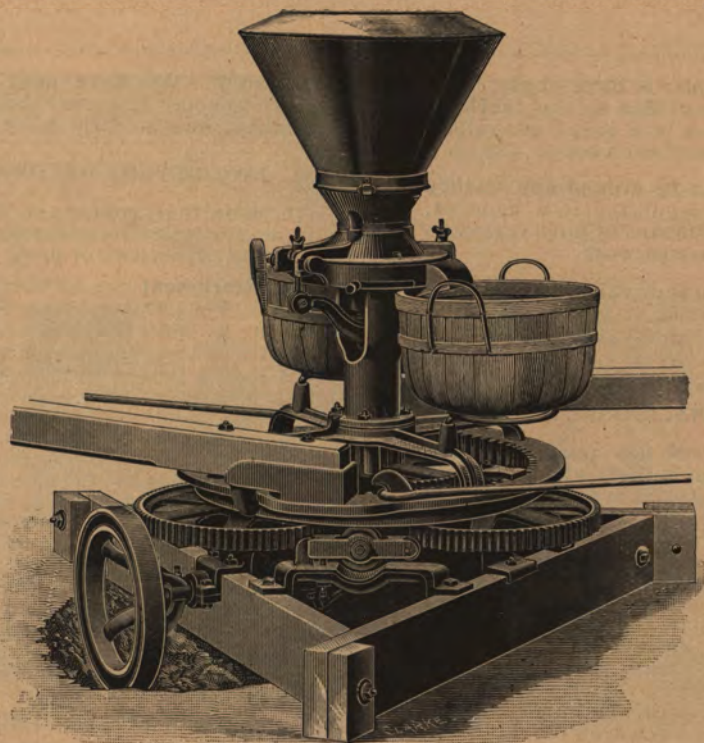
BOTH PLATES REVOLVE, ONE IN OPPOSITE DIRECTION FROM THE OTHER.

The sweeps or levers, to which horses are hitched, are attached to a large internal geared master wheel, into the teeth of which three strong pinions mesh, and through these pinions motion is imparted to the three large gear wheels, the teeth of which engage a heavy strong pinion on end of shaft which carries one of the grinding plates. The other one rests in casting which is attached to the master wheel and makes one revolution with each round of the horses and in contrary direction to other plate. With this plan we get greater speed without increase of power than can possibly be produced on any other Triple Geared Mill, and this, of course, gives us **greater capacity** than any other, and without increasing power. The three gear wheels above mentioned engagè the pinion on

shaft at the same time at different points equalizing the strain and giving a strong purchase and great efficiency to the mill. The teeth of all these gear wheels and pinions are dressed and fitted with greatest care to insure the least possible draft. At the ordinary speed of team the one grinding plate makes 30 revolutions to one round, or about 90 per minute, the other one revolution with each round of team.

THE GRINDING PLATES

Are of the same peculiar hard metal which have given our mills their unequaled record for durability, and are so dressed as to give them the greatest capacity and at the same time do an excellent quality of work, cutting oats and rye into fine feed, not merely mashing these grains, or letting most of the product pass through untouched, as is the case with most other mills of this class. They



DOUBLE ACTION MILL FOR EAR CORN AND SMALL GRAIN.

are so arranged that no injury is done should they run empty, as means are provided so the teeth do not come in contact. This is a great advantage and adds largely to the life of each set of plates.

Both quantity of feed to be ground and quality of work to be done, are regulated in a moment, without stopping team, by means of hand screws in convenient position and easy to work.

Plates are put in mill so they can be easily and quickly removed and replaced, or gotten at if desired, by simply loosening two set screws and turning the head back.

OUR FEED DISCHARGE

Is a great improvement, and has advantage over all others. We furnish two baskets with each mill, which set on rests as shown, and feed is alternately discharged into them, a cut off being used to change the discharge to the empty basket when one is filled, which can then be emptied without stopping team, loss of time or waste of feed, which is always the case with other machines. No extra gearing required with this arrangement, and nothing to get out of order or cause trouble; no trough or conveyor to choke or freeze up. We furnish two good bushel baskets which can be used elsewhere about the farm if desired. This arrangement is a great convenience and when seen its value will

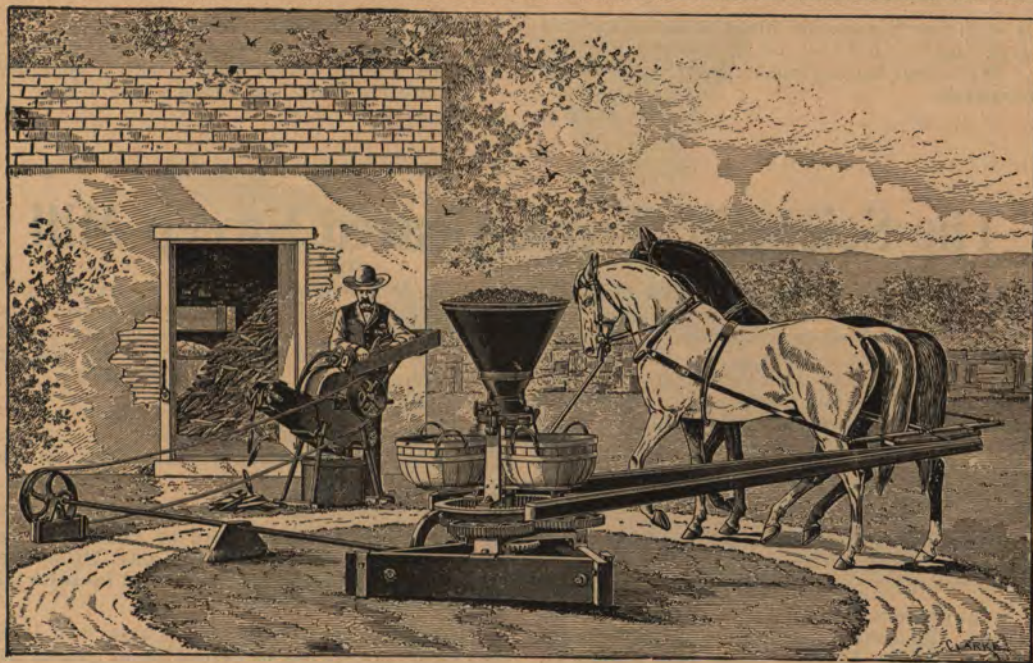
be appreciated. **We have built this Mill extra strong,** with special reference to great capacity and durability; we also furnish with it

TWO LEVERS OR TONGUES

So two, three or four horses can be used and the work can be controlled so it is entirely practical to operate it with either two or more horses.

Power Attachment can be furnished so that a Corn Sheller, Feed Cutter, Saw, or other similar machine, can be operated at same time grinding is done, or plates can be removed and mill used only as a power. A 15 foot rod goes with each attachment, and can furnish pulley either 15x4, 20x4 or 24x4, as desired. The Tumbling Rod makes 70 revolutions to one round of horses or 210 per minute, giving ample speed for any machine suitable for such power. This is faster, we believe, than rod runs on other machines. We generally furnish Mills with this attachment, but can furnish Mill only arranged for grinding ear corn and all small grains, where customers desire. The cut on page 43 shows our **Triple Geared Mill** all complete with Power Attachment, and from it a good idea may be gained of the **Double Action Mill** all complete, as the appearance is much the same, but the **Double Action**, having two levers, could be used with either two, three or four horses.

Capacity of Mill on small grain, 12 to 18 bushels



SCIENTIFIC TRIPLE GEARED SWEEP MILL AND POWER COMBINED AT WORK.

per hour with two horses and 10 to 15 bushels of ear corn, according to condition of grain and fineness of feed. With four horses work can be proportionately increased.

Price of Mill for Small Grain only\$55 00
 Price of Mill for Small Grain and Ear Corn... 70 00
 Price of Power Attachment, which includes
 Tumbling Rod, Rod Rests and Pulley..... 15 00

F. O. B. cars here.

The Scientific Triple Geared Sweep Mill

In some respects is like our **Double Action Mill**, but in this **only one plate revolves**, the other being stationary. It is lighter and corresponds in price, capacity, etc., with other similar mills. It is geared to give rapid motion to the revolving Grinding Plate, running it about 90 revolutions per minute, thus giving it greater capacity than the ordinary Sweep Mill, also much better results. The feed is discharged into baskets, as explained under **Double Acting Mill**, page 42. **A great convenience, and saves feed.**

The quality of work is regulated by a convenient hand wheel, so that fine or coarse feed can be made as desired.

Our arrangement for putting in plates is simplicity itself. By simply loosening a thumb nut the head or case can be thrown back and plates removed or replaced in a moment.

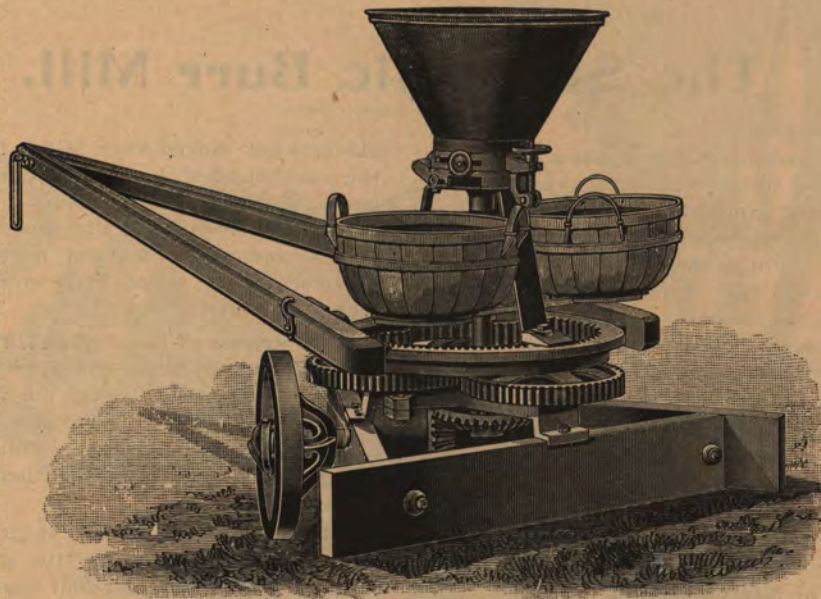
The Mill is shown on page 45 set up and ready for work, and will grind shelled corn, oats, rye, wheat and other small grains separately or mixed. It can be arranged to grind ear corn also, fine or coarse, as desired. We can furnish it

For Small Grain only.....\$50 00
 For Small Grain and Ear Corn..... 65 00
 Power Attachment for either (same as for

Double Action)... 15 00
 (See page 43 for Mill with Power Attachment.)

The Grinding Plates are of the same peculiar hard metal which have given our Mills their unequaled record for durability, and no injury is done should the Mill run empty.

The Mill has a capacity of from 8 to 12 bushels per hour, according to condition of grain and fineness of feed.



TRIPLE GEARED SWEEP MILL FOR EAR CORN AND SMALL GRAIN.

The Scientific Burr Mill.

WHILE we have heretofore made a specialty of Iron Feed Mills we have always had some demand for Burr Stone Mills, to which we have given much study, and made extensive experiments in producing the mill we now offer to the trade, and which will surely take rank as "THE BEST ON EARTH" among Burr Stones, as our Iron Mills have done for years in that class of mills. We therefore invite your attention to the SPECIAL FEATURES for which we claim SUPERIORITY:

The Burrs are Old Quarry French Stone Blocks, selected with care from the best quarries in France, dressed with reference to our particular work. The Running Burr is cemented to an iron ring which is fastened rigidly to the shaft, and runs in the main case, while the Stationary Burr is cemented to a solid casting which forms one bearing for shaft and is bolted to the main case itself.

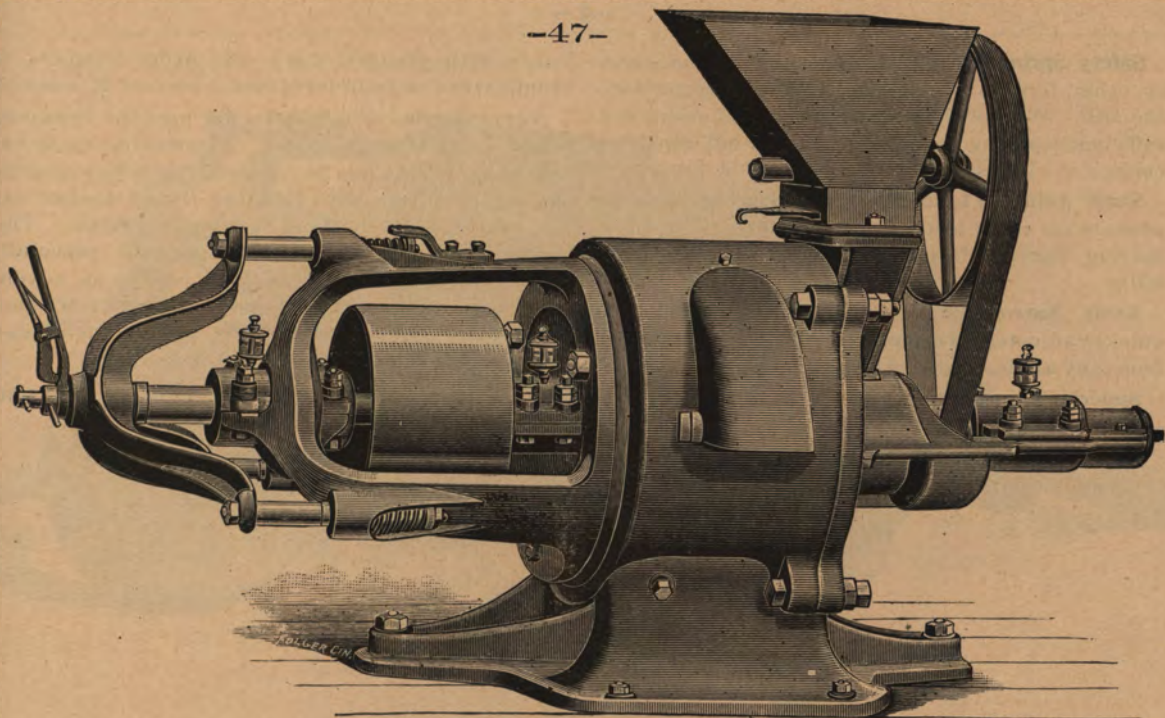
The Base to which the main case is securely bolted is one solid casting which when once set in

place, is not moved when Mill is taken apart, thus the position of Mill, with relation to line shaft, is never disturbed, and the trouble of "lining up" is avoided when putting Mill to work after dressing stones, and as the heaviest parts of Mill are not disturbed, there is but little trouble in removing stones and putting in place.

Quick Release of Burrs when through grinding, so that adjustment is not disturbed; but when Burrs are once set to grind desired fineness, they need not be disturbed unless to grind finer or coarser. We also have an arrangement peculiar to our Mill, so that Burrs do not run together when hopper is empty.

Ball Bearings at end of shaft, and of special design, found only on our Mill, so there can be no heating; all bearings are four times the diameter of the shaft, and babbitted with best metal.

Positive Force Feed that will handle all kinds of grain and crushed cobs without clogging.



THE SCIENTIFIC FRENCH BURR CORN AND FEED MILL.

Safety Springs to relieve stones should iron, stone, or other foreign substances accidentally get into the Mill. We use three of these springs, which are sufficiently strong for legitimate use, but sensitive enough to allow Burrs to open and avoid damage.

Shaft Adjusted Laterally in its Bearings to compensate for stock lost in dressing Burrs, instead of moving Burr itself on shaft, as is done in other mills.

Arms Surrounding Pulley, can be easily and quickly adjusted as desired, so mill can be belted to from any angle, or directly underneath.

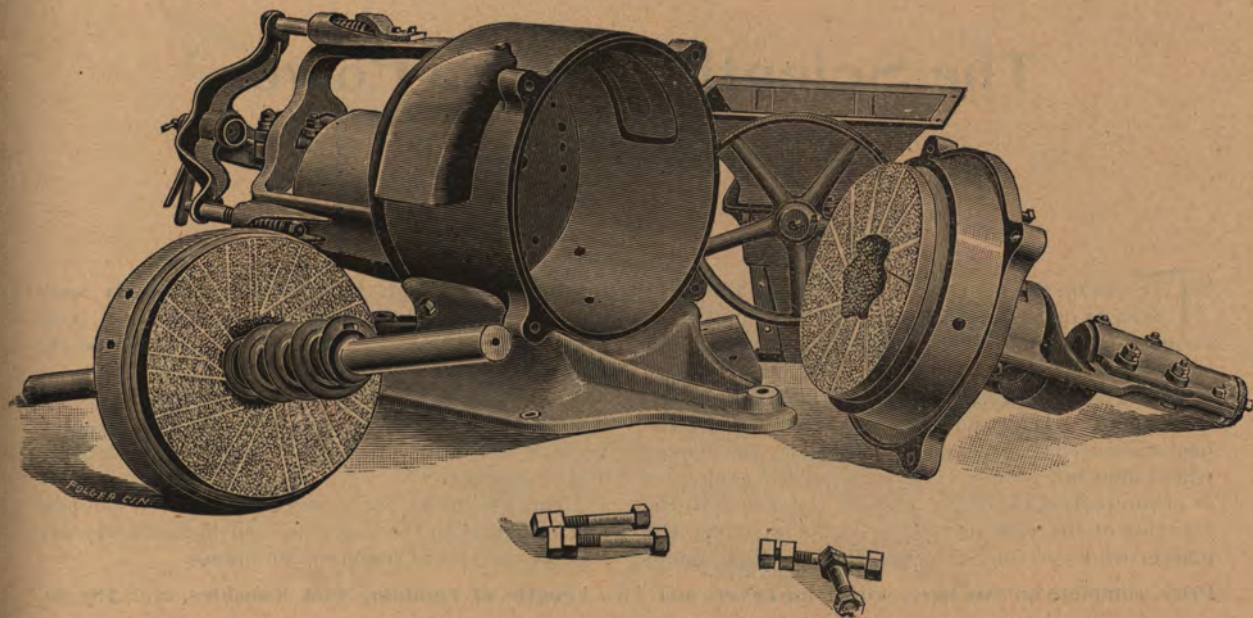
Superior Construction.—Every part about Mill is

made with greatest care, and from templets, so duplicates can be ordered and a perfect fit assured.

Very Simple.—Four bolts are used in fastening front plate to main case. By removing these the Stationary Burr can be removed; then by loosening pulley, the shaft with Running Burr attached can be removed and nothing further disturbed. This point will commend itself to anyone, especially those who are not practical mechanics, as anyone can take mill apart and put it together without trouble. We now have but one size—16-inch Mill—but can furnish others on short notice.

Price of 16-inch Mill on Cars here.....\$160.

Can Furnish an excellent Cob Crusher, if desired, at \$15. Write for Discounts.



THE SCIENTIFIC FRENCH BURR STONES.—TAKEN APART, FOR DRESSING STONES.

The Scientific Horse Power,

DOUBLE GEARED.

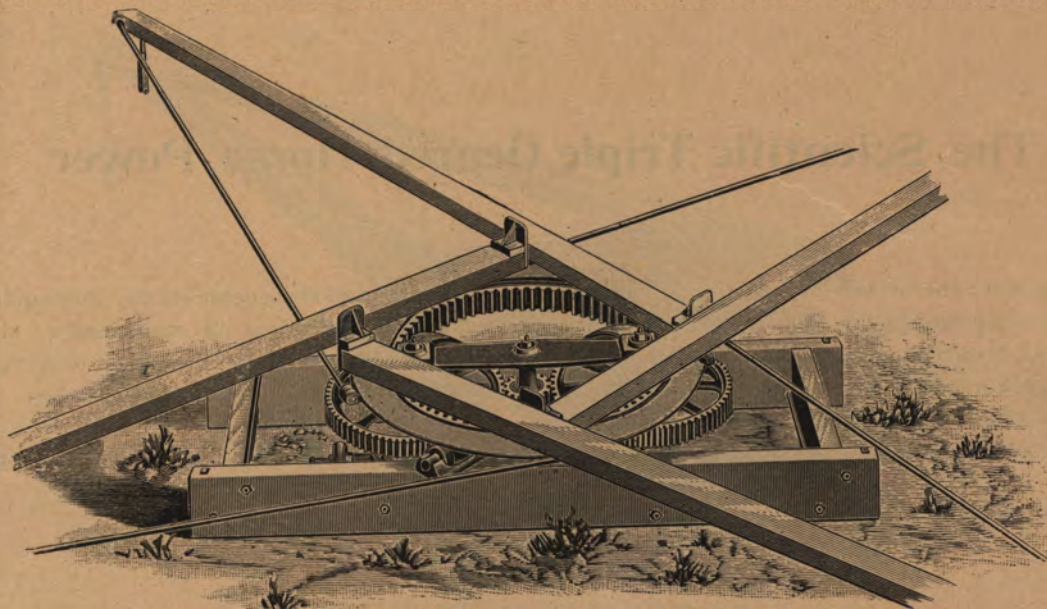
THE cut on the next page will furnish a correct idea of our Horse Power, which is unusually strong for a power of this kind, we having made it with special reference to the requirements of Feed Mills. The castings and timbers are all heavy and strong and carefully put together so as to insure the best work with the least possible friction. The master wheel does not rest on the flanges of the pinion, as in other powers, whereby a great resistance to the rotation of the pinions is caused; but we carry the master wheel on four friction wheels, which makes

it run so light that two horses can readily work it where no more power is required, and it is sufficiently strong for any work requiring eight horses.

This power, in connection with our H No. 1 Geared Mill (page 47), makes an outfit for grinding feed, of durability and capacity, without an equal on the market.

The weight of the power alone is 1,350 pounds, and is geared so the tumbling rod makes forty-five revolutions to one round of the horses.

Price, complete on cars here, with Four Levers and Two Lengths of Tumbling Rod, Knuckles, etc., \$85.00.



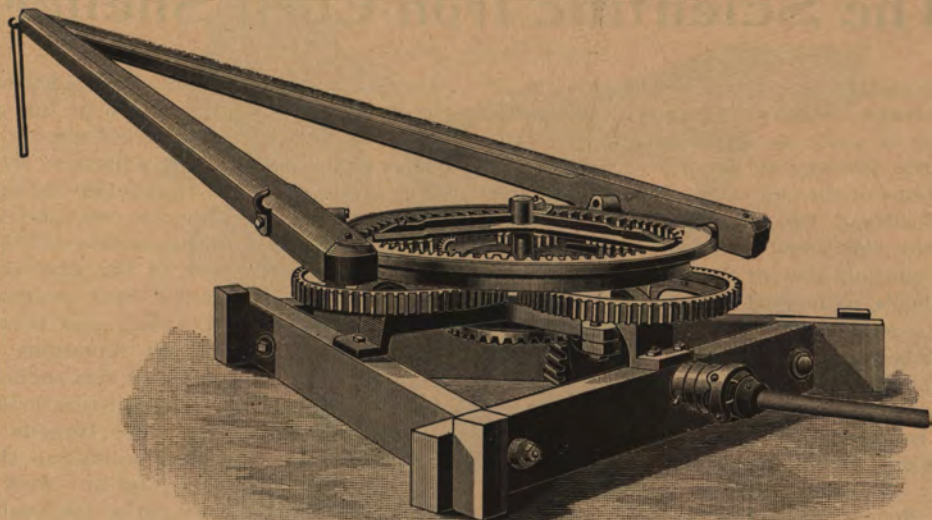
THE SCIENTIFIC FOUR TO EIGHT HORSE POWER.

The Scientific Triple Geared Horse Power

Is intended for one or two horses, and to run our two-hole Scientific Sheller. Can also be used with wood saws, feed cutters and other machinery requiring such power. The gears are fitted with great care, so that they work with the least possible friction, and every casting is made extra heavy so

as to withstand all reasonable strain. The tumbling rod makes 60 revolutions to one round of horse. We furnish with the power one lever, one 12 foot tumbling rod, two knuckles and one rod rest.

Price of power complete.....\$45 00



SCIENTIFIC TRIPLE GEARED HORSE POWER.

The Scientific Iron Corn Sheller.

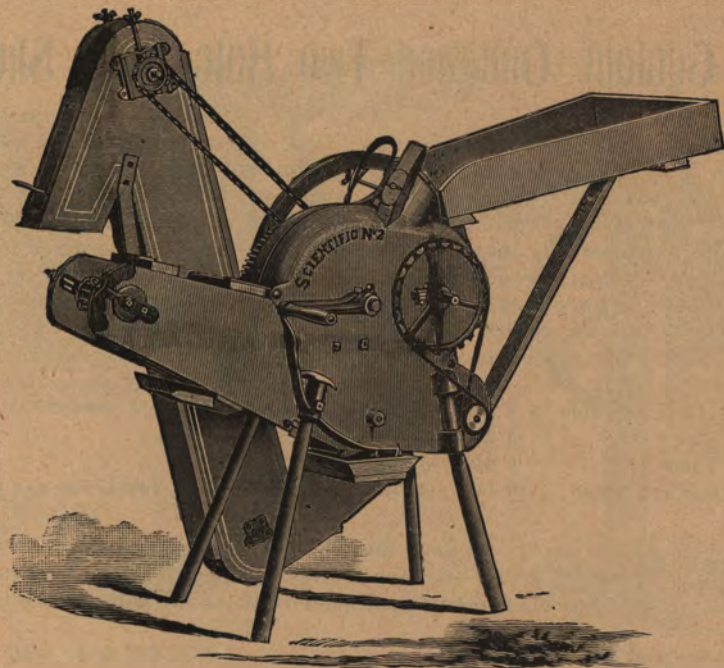
WE offer something entirely new in this line of machinery which we think will be appreciated, as it is quite an improvement over the ordinary wood sheller. It is all iron except the table and frame of the cob rake. The main frame or casing consists of two solid iron castings, which enclose all the wheels and machinery for doing the work. The journals also for the shafts which carry the gear wheels, pulley and fly wheel, are in these castings, so a solid bearing is always furnished, and the castings being bolted together, are held firmly in place; cannot warp or twist out of shape and thus throw the journals out of line, and cause the machine to run hard and soon shake to pieces. The legs are gas pipe which fit in sockets, and are held in place by set screws and are thus adjustable to uneven floor. The fan in this sheller is not an ordinary sheller fan, but is much superior, having a cut-off similar to all pressure fans, so all the blast is utilized in cleaning the grain, so we get a stronger blast and can clean the grain better than

on ordinary shellers. We operate the cob rake by direct gearing, as will be seen in cut, and in this way dispense with two sprocket wheels, six feet of sheller chain and two idler pulleys to stretch same.

The arrangement of the sheller inside is similar to all wood shellers, except we have made some changes which add to the efficiency of the machine. We give an extra turn to the ears just as they leave the sheller, and find that we can clean all grain from ears that would pass through other shellers with some kernels remaining. We only make one size and style of this sheller, using on all a table fan and cob rake, but can furnish sacking attachment if desired. We furnish with each sheller a crank and 12x4 pulley, as they can be operated by hand or run by any kind of power, and have a capacity of 250 or 300 bushels of corn per day.

PRICE OF SELLER.

With Table Fan and Cob Rake.....	\$25
With Table Fan, Cob Rake & Sacker.....	\$40



IRON SHELLER WITH TABLE, FAN, COB RAKE AND SACKER.

The Cyclone One and Two Hole Corn Sheller.

THE one hole is a right hand sheller, which we can furnish with or without fan or table. The table is supported by a wrought iron loop which fastens over the spout and can thus be easily and quickly removed or put in place. Oil cups are on all boxes, an advantage over other shellers of this class.

It has a row of auxiliary or force feed pickers on rim of picker wheel which act as a force feed and prevent clogging, so that the largest ears of corn may be fed either end foremost.

	PRICE.	WEIGHT.
One-hole Sheller, without Fan or Table..	\$ 9 00	125 lb.
One-hole Sheller, with Fan.....	9 50	130 lb.
One-hole Sheller, with Table.....	9 50	132 lb.
One-hole Sheller, with Fan and Table...	10 00	137 lb.

The two-hole sheller we can furnish with table, fan and cob carrier, and it is the best sheller of this grade on the market, using good heavy lumber, which is put together in first-class workman-like manner. The balance wheel is large and heavy and carefully balanced so there is no irregular motion. The cob carrier is made from the best wrought iron wire, driven by a chain which gives it a positive regular motion. It is intended for either hand or light power. We make a one or two horse Triple Gearing Power well suited for this machine—wood saw or feed cutter.

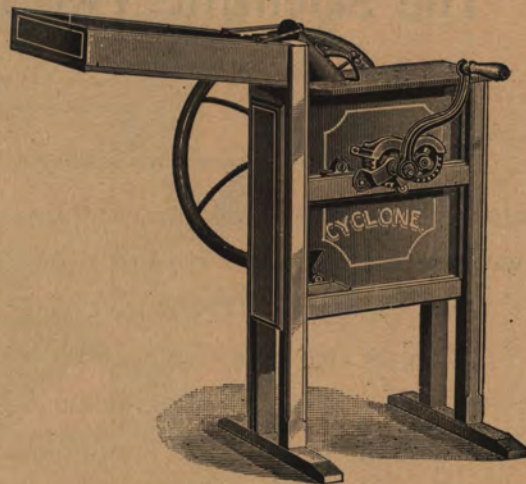
	PRICE.
Two-hole Sheller, Table, Fan and Cob Carrier...	\$20 00.

We make the "Cyclone" to meet the demand for a low priced sheller, but pride ourselves that we use better material and furnish a much better machine than others of this class are furnished at equal price. We also make our "Scientific" one and two-hole wood shellers which are much heavier and better, the price for same also being greater.

Price for one-hole, Fan and Table.....	\$12 00.
Price for two-hole, Table, Fan and Cob Carrier.....	25 00.



TWO HOLE CORN SHELLER.



ONE HOLE CORN SHELLER.

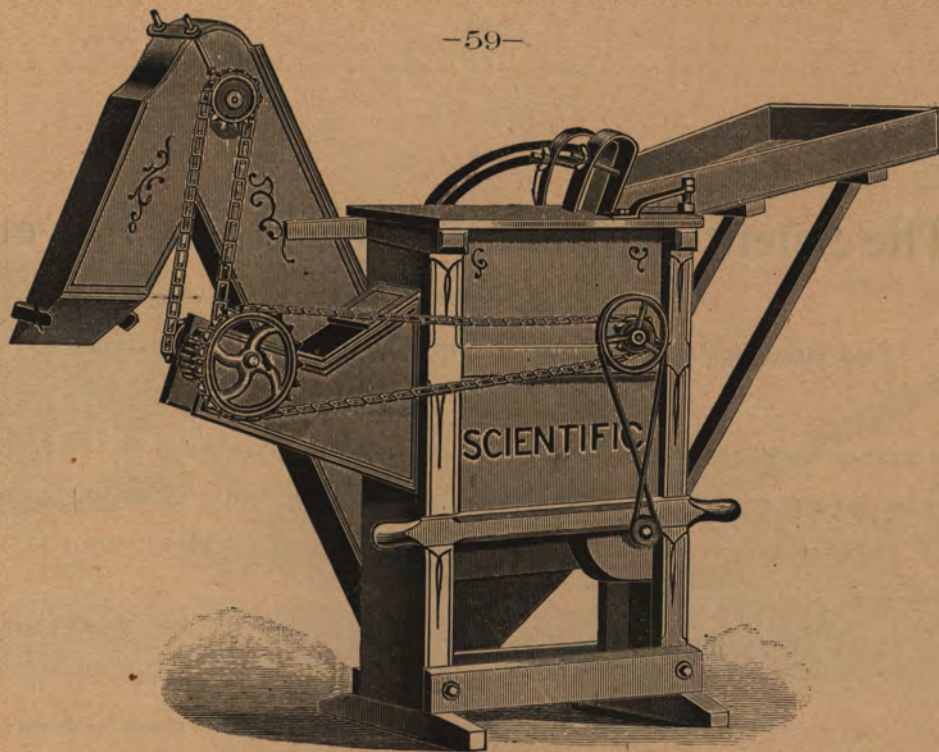
The Scientific Two Hole Sheller and Sacker.

Many customers want a sacking attachment with sheller, so corn can be delivered into sack without handling. We therefore make such attachment for our Scientific two hole sheller, as shown in cut on opposite page.

Has capacity of 250 to 300 bushels per day.

Price of two hole sheller, table, fan, cob rake and sacker, \$40.00.

Can also furnish longer sacker, suitable for delivering corn into wagon or bin, and will name price for such additional length to any one desiring.



THE SCIENTIFIC TWO HOLE WOOD SHELLER AND SACKER.

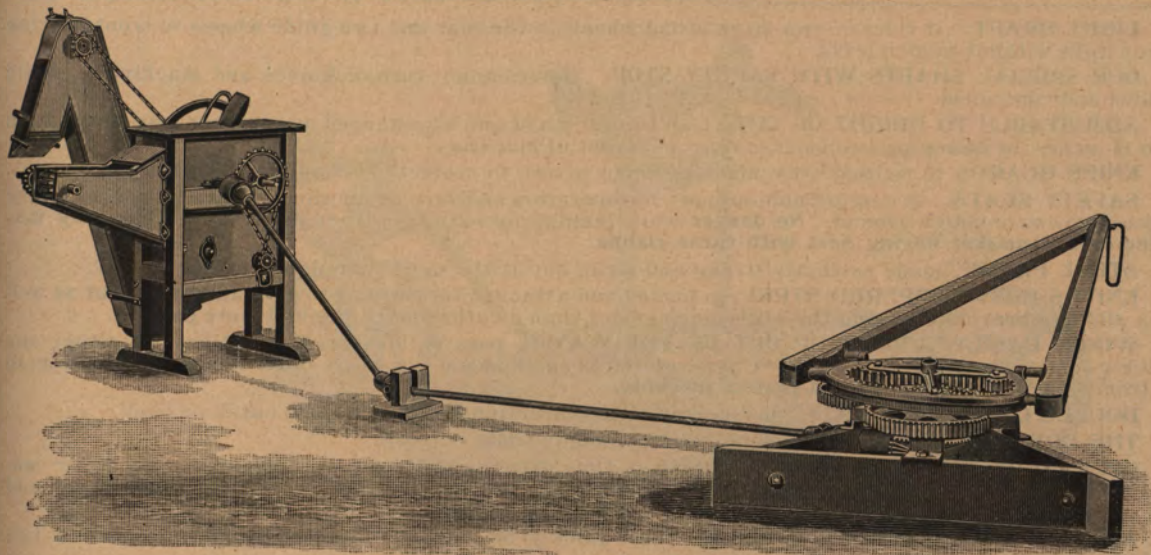
The Scientific One and Two Horse Power

—W.T.H.—

Two Hole Scientific Sheller, Table, Fan, Cob Rake and Sacker.

This makes a desirable outfit. The sheller is attached direct to the tumbling rod of power by means of couplings, as shown, dispensing with gearing, band wheels, belts, etc. The machines are fully explained on pages 58 and 52, and the manner of working is here shown.

Price of outfit, as shown, \$85.00.



SCIENTIFIC TWO HOLE WOOD SHELLER, TABLE, FAN, COB RAKE AND SACKER, WITH ONE OR TWO HORSE POWER.

THE SCIENTIFIC CORN HARVESTER. Latest Improved Steel Frame.

LIGHT DRAFT. It rides on two large broad wheels in the rear and two guide wheels in front, making it run light without sudden jerks.

OUR SPECIAL SHAFTS WITH SAFETY STOP. Horse cannot turn on knives and machine is easily guided and controlled.

ADJUSTABLE TO HEIGHT OF CUT. Can be easily and quickly changed as operator may desire from 3 to 14 inches, by changing two bolts in rear and front of machine.

KNIFE GUARDS to be used when machine is not in use, to protect the blade and avert accidents.

SAFETY SEATS. A comfortable support for operators and sure protection from falling as machine passes furrows or rough ground. **No danger** while leaning forward to gather down corn. **The only machine on the market having Seat with these claims.**

STEEL FRAME, made perfectly strong and rigid, but at the same time light and not clumsy.

KNIVES BEST TEMPERED STEEL, so placed and attached to wings as to give an **upward cut** as well as a **sliding shear cut**, making the work much easier than on other machines and more certain.

WINGS EASILY TURNED UP OUT OF THE WAY to pass gallows or obstructions, or either one quickly removed entirely if desired. Can be stored in small space. A great convenience when taking to or from field. **Indispensable to a perfect machine.**

DOUBLE CASTER WHEEL turns freely in either direction, nothing in it to catch or bind.

THE BOYS CAN HANDLE IT and quickly save many times its cost.

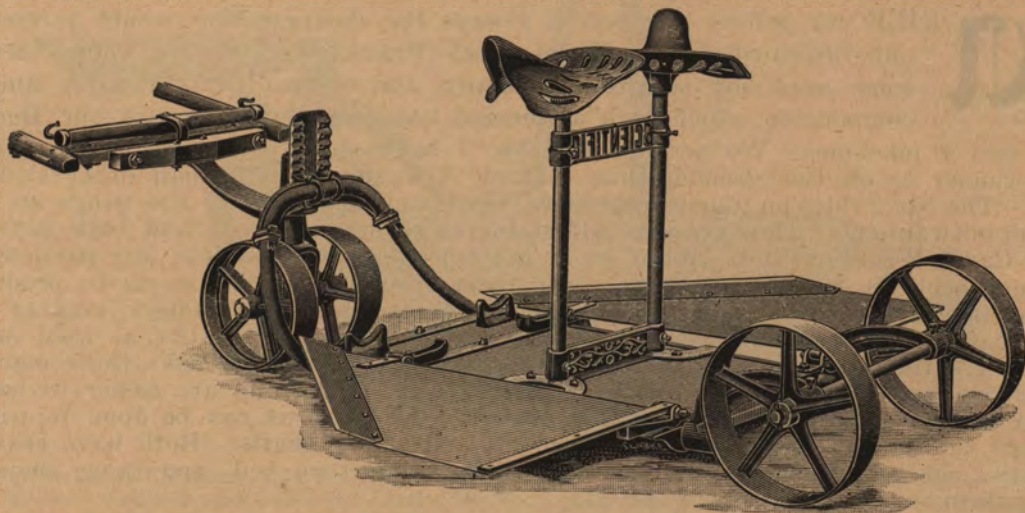
OPERATORS SIT AT THE WORK, which is thus greatly lightened, as compared with other machines, and being able to **firmly brace themselves**, there is no danger of falling off the machine, should the horse stop or start suddenly, as is often the case.

ADJUSTABLE, INDEPENDENT SEATS. Can quickly be raised or lowered to accommodate a tall and short operator at the same time.

MALLEABLE IRON AND STEEL, so it is almost **impossible to break** it and is practically **everlasting.**

WRITE FOR PRICES.

The Scientific Corn Harvester No. 1. THE BEST HARVESTER ON EARTH



WITH SAFETY SHAFTS to prevent accident to horse.

WITH SAFETY SEAT to prevent accident to operators.

WITH SAFETY GUARD to protect knives and prevent accident when machine is not in use.

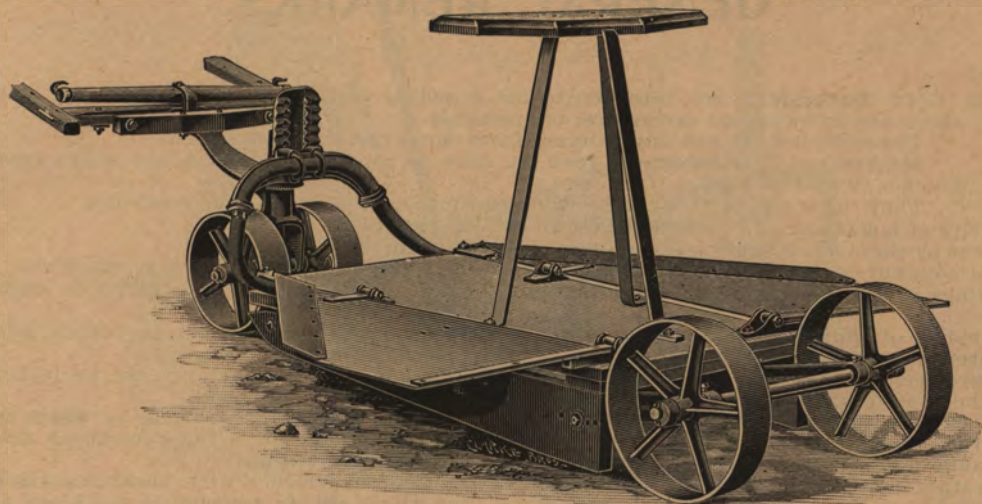
The “Buckeye” Corn Harvester.

WHILE we believe the best is always the cheapest and would recommend our “Scientific” Four-Wheel Steel Frame Machine, we know there is some need for something cheaper, and to meet this demand, and the competition which such a demand has created, we furnish our Buckeye No. 1 and 2 machines. We arrange the No. 1 so that only a part of the rear end of the runner is on the ground, thus making it easier to pull than other sled machines. The No. 2 rides on four wheels. On these machines we place the wings so as to make an outward cut. They are also adjustable as to height of cut, and both have our Double Caster Wheel in front. While we do not consider these equal in any particular to our four-wheel “Scientific,” we have given them special attention, so as to produce a machine in every way superior to all other types of similar harvesters, making them very strong; the knives and wings being the same weight and quality as used on our “Scientific,” and with every convenience possible at the price we ask—these machines will cut corn better than the ordinary machines of this class and are easier to handle. The cut on page 4 shows the machine with one wing turned up, as can be done in passing gallows. Cut on page 8 shows it with wheels and safety shafts. Both have seats for operators, but **not** adjustable. Wings have long support on bed, and brace underside making them very stiff and strong.

LIST PRICE ON No. 1 BUCKEYE.....
“ “ “ “ 2 “

WRITE FOR PRICES.

THE BUCKEYE CORN HARVESTER, No. 2.



Wood frame and Runners like No. 1 Buckeye, but rides on wheels, having **Double Caster Wheel** in front and two wheels in rear; also our **Safety Shafts** to guide machine. Wings make out-cut only, adjustable as to height, leaving uniform stubble, 6 to 14 inches. It is the **best Four Wheel, Wood Frame Harvester made**, but not equal to our Scientific, which we believe, all things considered, to be the best and cheapest machine of the kind on the market.

LIST PRICE ON No. 2 BUCKEYE.....

WRITE FOR PRICES.

GENERAL REMARKS.



Our Corn Harvesters are intended to cut standing corn, and will do the work faster and easier and at an actual saving over old methods.

The draft is light and any ordinary farm horse can easily pull them.

Machines will cut one or two rows at once as desired, planted in any width from 2 feet 6 inches to 4 feet, or wider if necessary.

They run steady without the jerking motion found in most other machines.

The price of a machine can easily be saved in cutting twenty acres of corn.

Corn cut by these machines will stand in shock better than if cut by hand.

Men or boys not experienced in cutting corn the old way can do the work on these machines.

The wings and knives being of steel, castings of malleable iron, there is nothing to wear out or break.

The amount of work in given time depends on the men handling the machine, which will cut all the operators can take care of.

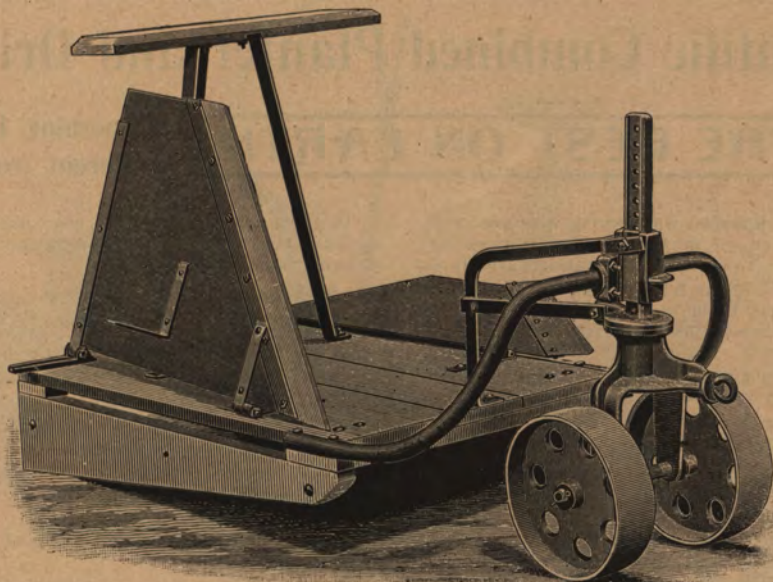
We have been making Corn Harvesters for five years and present machines are perfected in the light of the experience we have gained.

All of our Harvesters have double Caster Wheels, our own patented devices, by which machines can be turned short around. It will not get out of order nor break, nor is there anything about it to catch or annoy the operator in turning, it being simple, strong and reliable.

These statements are made in the light of actual practical experience with these machines in the field, testified to by hundreds of customers who have used them, and we guarantee, if machines are properly handled, the above can be realized in the experience of any one cutting corn.

There are more of our make of machines in use than of any other and our sales from year to year were largely in excess of any other, as can be proven by the record.

From the present outlook the hay crop will be short in many sections, which will make corn fodder more valuable than ever. The best machines should be used to gather it quickly and economically.



BUCKEYE HARVESTER, No. 1.

Showing Wing Turned Up to Pass Galls.

The Scientific Combined Planter and Drill.

THE BEST ON EARTH!

Something Entirely New,
Different from All Others.

Independent Flexible Runners, with Spring Pressure, a decided improvement over all others, making our planter much simpler and easier to operate. The runners are hinged to the front end of steel frame and are easily controlled by the Hand Lever, forcing them to a desired depth, and the springs hold them in place so that a uniform depth is maintained in crossing furrows or uneven ground, leaving them also flexible in passing obstructions. **We apply the pressure direct to the Shoes, not to the Frame.**

Independent Covering Wheels, can be quickly changed to make them open or solid tread. *

Adjustable Guards on Runners and steel covering shovels to regulate the depth of planting in all kinds and condition of soil.

Balanced Frame, practically no weight on the horses' necks whether runners are in or out of ground.

PERFECT CHAMBER DROP, no springs, no complication, drop regularly 2 to 5 grains by changing plates to suit size of corn.

Plants three widths—3 ft. 4 in., 3 ft. 6 in., 3 ft. 8 in., by simply changing the runners.

Drills 10, 12, 14, 16 or 18 inches apart by changing the sprocket wheels and changing speed and using thin plates instead of thick ones.

THE SCIENTIFIC CHECK ROWER contains the most important improvements in recent years.

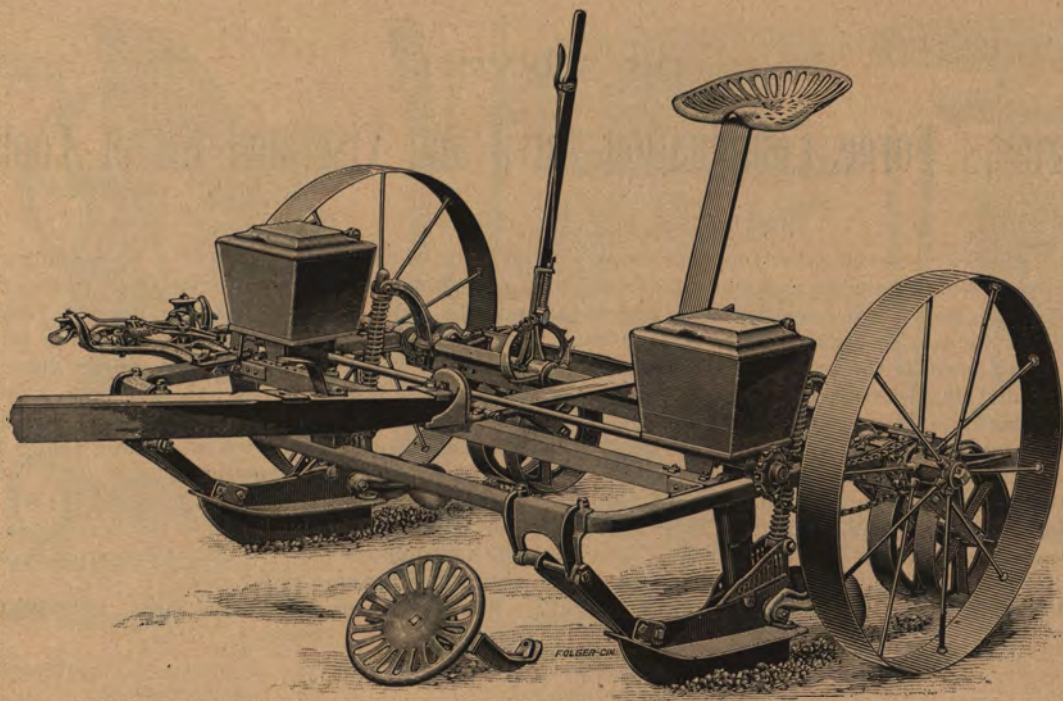
Only Check Rower which does not require skill to handle it.

Adjusts itself automatically when set forward or back to suit gait of team, thus overcoming the great source of trouble in all check rowers.

Check Rower fork opens automatically at proper instant to pass knot, avoiding friction, consequently wire will last life time of the planter as it passes through the fork in a straight line.

The only Planter that can be backed without doffing the wire.

These Features Give Us a Planter neater, lighter and easier to handle than others and more durable; one that **PLANTS EQUALLY** well in **ROUGH, UNEVEN, HARD OR SOFT GROUND**; no deeper on a ridge than on a level. Does not drag in soft ground.



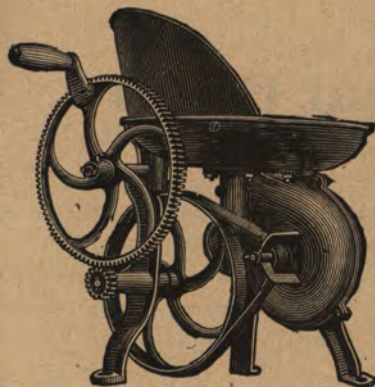
THE SCIENTIFIC

Farmers' Forge, Combination Anvil and Vise, and Kit of Tools.

WE illustrate on the following page a kit of tools which we make especially for farmers for doing blacksmith work on the farm, and with these tools the greater part of the work that must be taken to town, or the nearest shop, can be done at home, and at great saving, both of time and money, which, in the course of one season, will greatly exceed the cost of the tools. The principal articles in this kit we make ourselves and can therefore guarantee them to be superior, and, at the same time, we are able to furnish them cheaper than such goods can be bought elsewhere, and at these low prices we don't think you can afford to be without them. The forge is built especially for

our kit, is 15 inches high to top of bowl; bowl, 14 inches diameter; fan, 8 inches diameter; weight, 45 pounds. We guarantee it the lightest running, strongest blast and the best forge made for the purpose. The anvil is solid and strong; face, $4\frac{1}{2}$ x 9 inches; vise jaws, 3 inches wide and open 4 inches. The drill is not a cheap bench drill, but a genuine blacksmith post drill with adjustable table; drills $\frac{1}{4}$ inch hole to the center of 18 inch circle. Compare it with other drills offered with kits. We warrant every tool in this kit to be the best made, and the kit complete the best and cheapest on the market, and guarantee satisfaction.

Price of Kit, complete, on cars here, \$25.00.



Farmer's Forge, No. 5B, will heat
1 1-2 inch iron.



Farrier's Pincers, Cast Steel, 12 inch.



Screw Plate, 3 Taps, 3 Set Dies, Cut 1-2,
3-8 and 5-8 Inch.



Farrier's Knife, Woostenholm.



Blacksmith
Hammer and
Handle, 2 lbs.,
solid cast steel.



Combination Anvil and Vise, hardened face,
finely polished, weight 55 pounds.



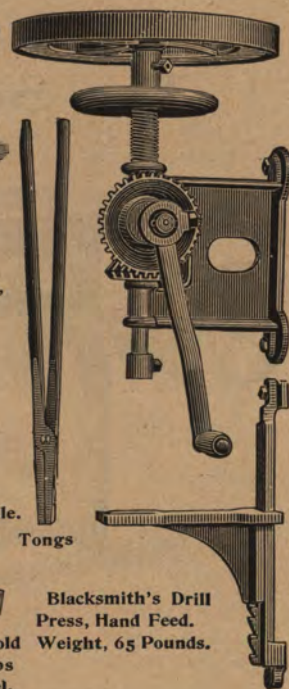
Adze Eye Shoeing Hammer and Handle.
Weight, 9 ounces.



Blacksmith's Hot
Chisel, 1 1-2 lbs.,
solid cast steel.



Blacksmith's Cold
Chisel, 1 1-2 lbs
solid cast steel.

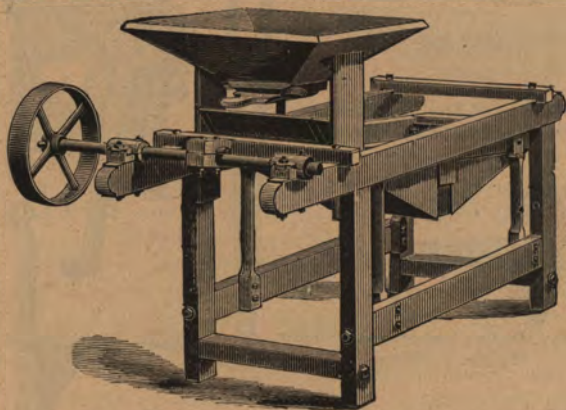


Blacksmith's Drill
Press, Hand Feed.
Weight, 65 Pounds.



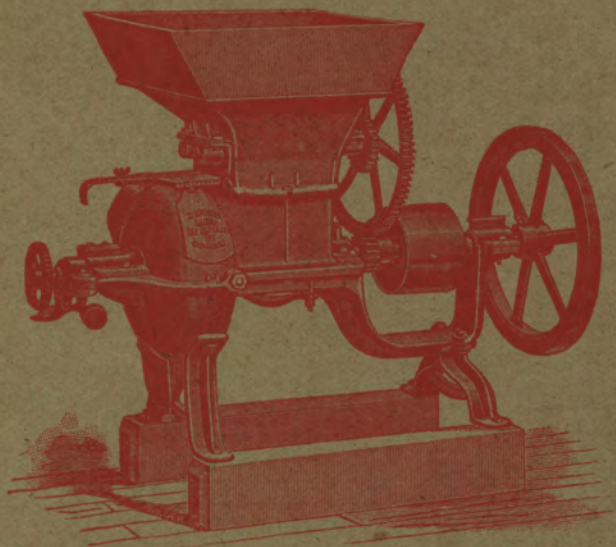
Tongs

The Scientific Corn Meal Bolter.



Is strong, substantial and well made, every joint in the frame being secured by a draw bolt, by means of which the joints are prevented from becoming loose. The seive frame is clothed with steel wire bolting cloth of suitable number for corn meal; coarser or finer can be put on if desired. The bolter can be driven, if desired, direct from the mill by a clamp pulley bolted to the fly wheel.

	PRICE.
Bolter, with Hopper and Pulley.....	\$20 00
Clamp Pulley.....	2 00



STYLE L, NO. 1 MILL.