

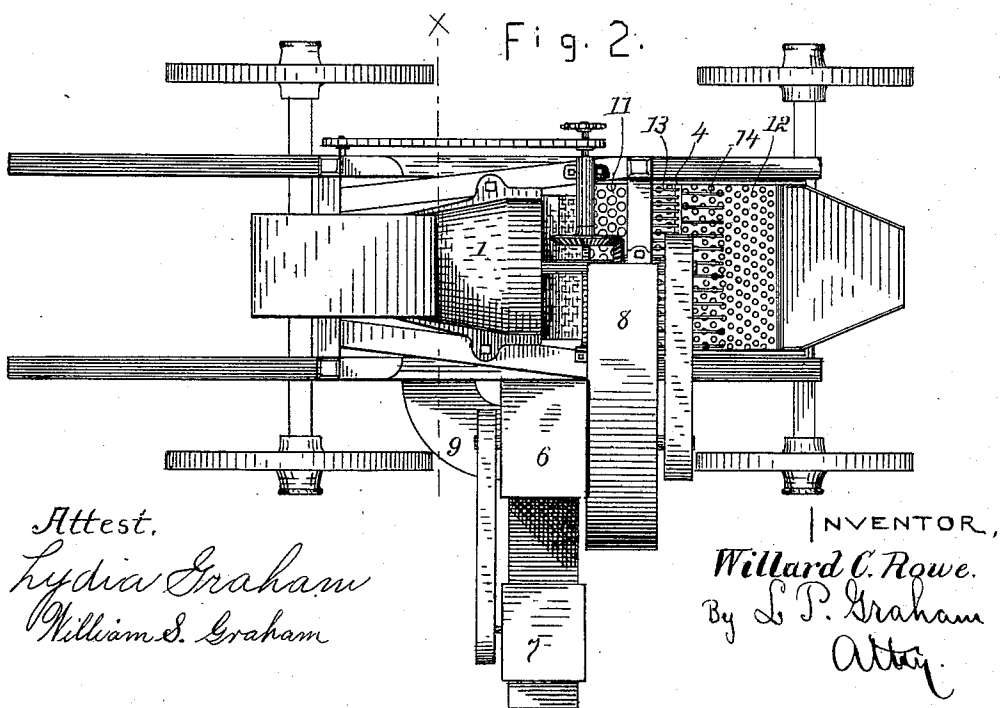
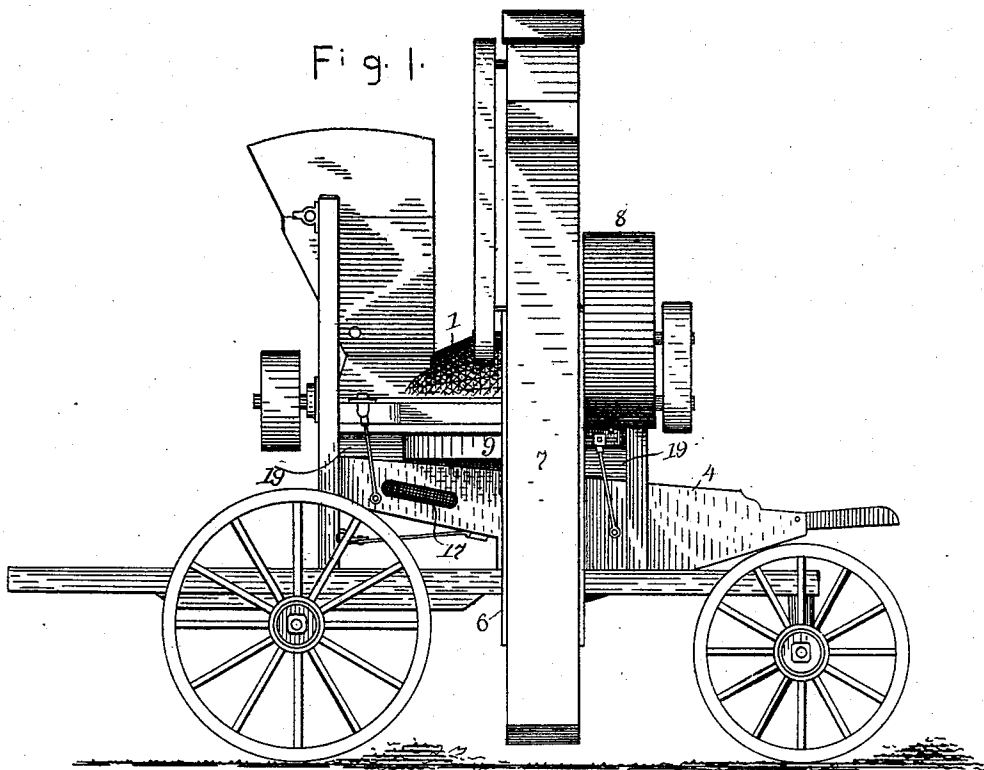
(No Model.)

3 Sheets—Sheet 1.

W. C. ROWE.
CORN SHELLER.

No. 565,926.

Patented Aug. 18, 1896.



Attest,
Lydia Graham
William S. Graham

INVENTOR,
Willard C. Rowe.
By *L. P. Graham*
Atty.

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Fig. 3.

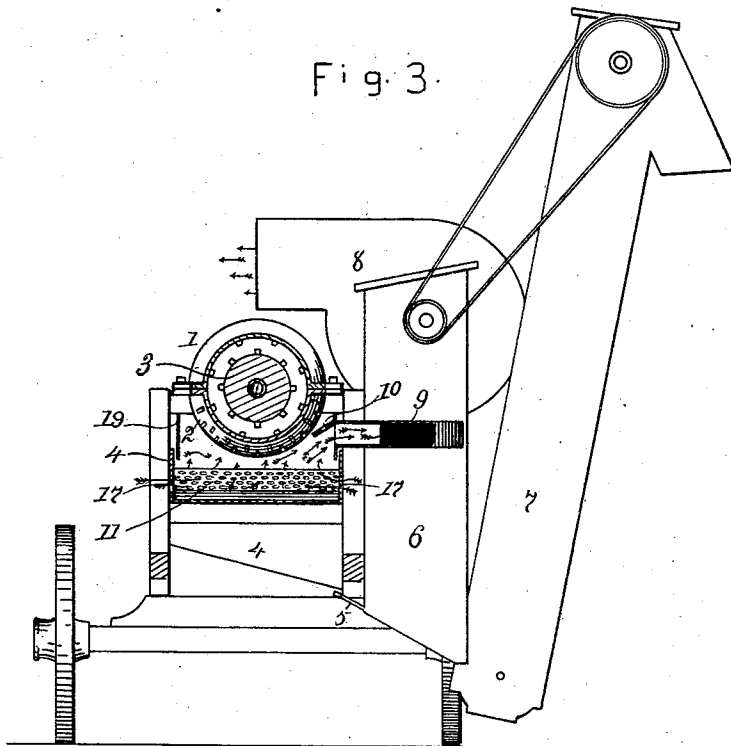
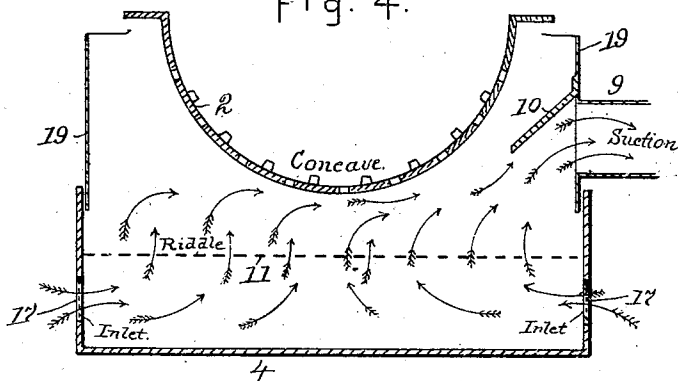


Fig. 4.



Attest.
Lydia Graham
William S. Graham.

INVENTOR.
W. C. Rowe.
By *S. P. Graham*
Atty.

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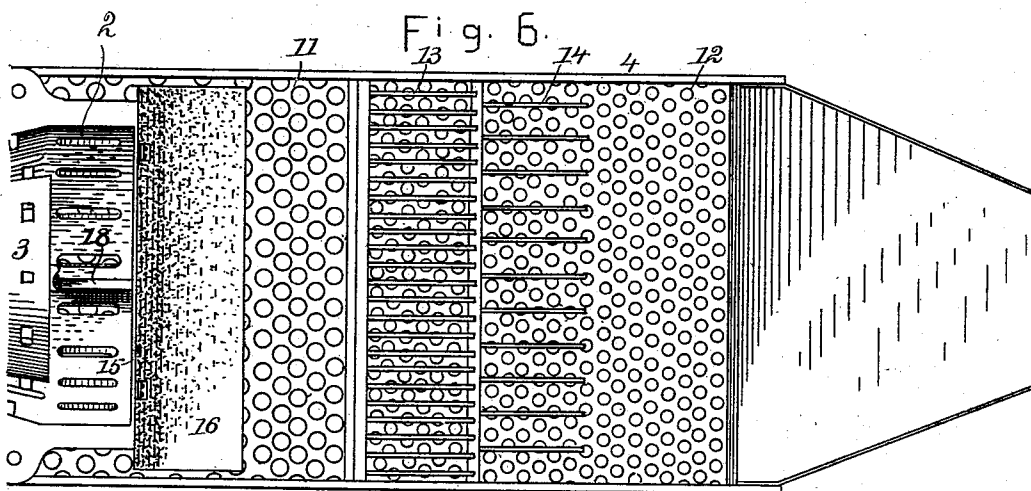
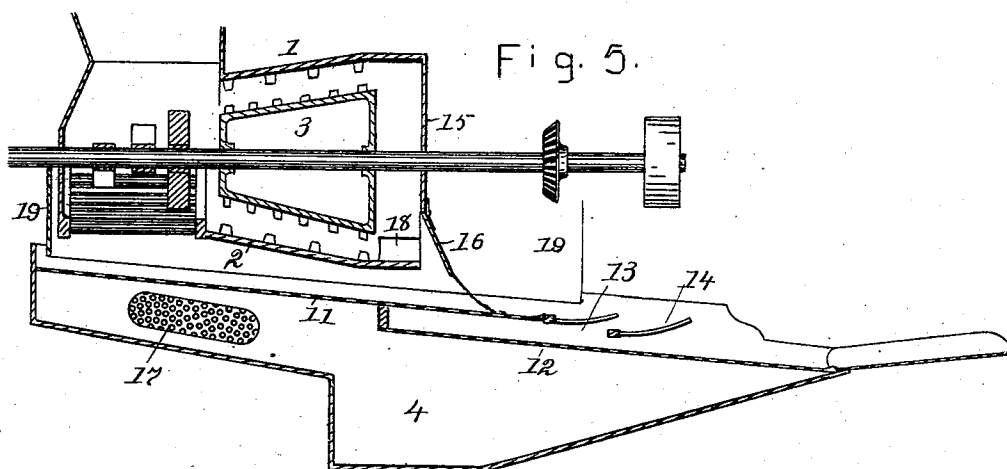
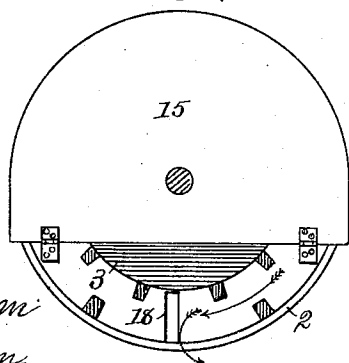


Fig. 7.



Attest.

Lydia Graham
William S. Graham

INVENTOR
Willard C. Rowe.
by *L. P. Graham*
Atty.

UNITED STATES PATENT OFFICE.

WILLARD C. ROWE, OF DECATUR, ILLINOIS, ASSIGNOR TO THE UNION
IRON WORKS, OF SAME PLACE.

CORN-SHELLER.

SPECIFICATION forming part of Letters Patent No. 565,926, dated August 18, 1896.

Application filed January 22, 1896. Serial No. 576,427. (No model.)

To all whom it may concern:

Be it known that I, WILLARD C. ROWE, of Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Corn-Shellers, of which the following is a specification.

This invention relates to the separating mechanism of corn-shellers. It is exemplified in the structure hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a sheller containing my improvements. Fig. 2 is a plan of the same. Fig. 3 is a transverse vertical section on line X in Fig. 2. Fig. 4 is a sectional diagram illustrative of the operation of one of the features of my invention. Fig. 5 is a longitudinal vertical section through the shelling-cone, the concaves, and the shaker. Fig. 6 is a plan of the tail end of the cone, the lower concave, and the shaker. Fig. 7 is an elevation of rear end of concaves and cone with flap removed.

Prior to my invention of the features hereinafter described shellers have been made on the general plan shown in the drawings herewith embodied—that is to say, the general features of the concaves 1 and 2, the shelling-cone 3, and the shaker 4 have been used in substantially the correlation shown. The lower concave 2 has been slotted at its throat and throughout its length to permit free passage of the shelled corn to upper riddle 11. The concaves have been made to extend rearward beyond the cone. The upper part of the discharge end of the shelling-compartment has been closed by a permanent wall, as 15, and the lower part partially closed by a swinging flap, as 16, the lower edge of which rests normally on riddle 11. The shaker 4 has been equipped with riddles substantially the same as 11 and 12, and has also been supplied with fingers 13. The shaker has been made to discharge the corn to an elevator, as 7, over a perforated incline, as 5, and under the down-leg 6 of a suction-fan 8. Shellers having these peculiarities are practical machines of an advanced type, but they have imperfections as follows:

First. The silks that to a greater or less extent adhere to all husked corn become sepa-

rated in the act of shelling and are to a large extent carried downward through the slots of the concave and onto the riddle under the concave. Here they are subjected to a continued beating from the shelled corn, which is thrown down through the slots of the concave with considerable force, and are either packed into the interstices of the riddle or accumulated on the surface of the same in a manner to seriously interfere with the passage of shelled corn through the riddle. If the corn is not cleanly husked, the difficulty is increased by the addition of husk-shreds to the silks, and the upper, forward end of the riddle becomes practically useless. This imperfection has long been known, and doors have been made in the casing to give access to the space between the concave and riddle for purposes of examination and manual removal of obstructions that accumulate. Such manipulation requires constant attention on the part of the operator, however, if best results are to be attained. It is very liable to be neglected, and it is, on the whole, a very imperfect remedy for a rather serious defect.

Second. While a great deal of shelled corn passes through the slots of the concave, there is a very considerable amount discharged through the opening at the rear end of the shelling-compartment. The natural tendency of the action of the shelling-cone is to throw this corn all to one side of the lower concave, and it is thereby accumulated on one side of the riddle. This tends to overtax one side of the riddle, while leaving the other side comparatively unused, and as a result the riddle must be needlessly large or the separation will be imperfect.

Third. In the principal corn-growing districts, at least, the present tendency is to husk corn rapidly and carelessly, a common operation being termed "slip-shucking," and the result thereof being imperfect separation of the corn from the husks. Under these conditions large quantities of husks are made to pass through the sheller. It is a common occurrence for shreds of husk of considerable width to travel over and off the riddles on their convex surfaces, and it sometimes happens that such shreds contain grains of corn in their boat-like concavities. At this stage

of the development of the art of shelling and separating my invention begins, and it is my object to prevent the riddle-surface below the concave from becoming obstructed, to prevent the shelled corn, cobs, &c., from being discharged from the rear end of the shelling-compartment on one side only of the riddle, and to prevent husks and the like from carrying grain off the riddles.

10 Broadly stated, I attain the first-named result by applying air-suction to the space between the lower concave and the riddle. In a more restricted sense, I keep the riddle clean by means of a fan having its suction-leg connected with such space in a manner to be hereinafter explained. I attain the second-named object by placing a vertical deflecting-plate at or near the vertical center of the rear end of the lower concave, immediately in the rear of the shelling cone or cylinder. The last-named effect is produced by passing the husks over a set of tumbling-fingers, disposed in a manner to be hereinafter described.

25 In this particular instance a tube 9 connects the suction-leg 6 of fan 8 with the space between the concave and the riddle, such arrangement being very desirable on account of its convenience, but not indispensable or incapable of variation. The tube opens into the space through casing 19, and immediately above the opening is an oblique shelf 10, which deflects the shelled corn away from the opening and out of the influence of the air-suction. Openings are made at 17 through the sides of the shaker, below screen 11, and such openings are small enough to prevent passage of corn and numerous enough to supply a sufficient quantity of air. The casing 19, the sides of the shaker, the flap 16, and the cobs, &c., on the lower end of the riddle form a pretty complete inclosure of the space under the concave, and almost all, or at least a very large per cent., of the air that is drawn through tube 9 is first made to pass through openings 17 and up through the interstices of the riddle. Under these or similar conditions the suction of the fan raises all the lighter particles of silk, husk, &c., and carries them bodily from the sheller, and it exerts sufficient force on the larger particles to prevent them from clogging the riddle. The suction is distributed uniformly to all the interstices of the riddle-surface under the concave, and while it is strong enough to effect the described result it is not so strong nor so much concentrated as to interfere with the descent of the corn through the riddle.

It is desirable that the fan shall connect with the casing pretty well to the front thereof, as it is the front end of the riddle that the suction is particularly designed to clean. That part of the riddle under the rear end of the concave becomes covered with cobs, husks, &c., to an extent sufficient to prevent the corn from driving the silks into the interstices of the riddle, the sliding action of the cobs

has a cleaning tendency, the accumulation is sufficient to interfere with the suction even if it were desirable to apply it to that part of the riddle, and if the suction were applied to the rear end of the sheller it would tend to draw from other sources than the space between the concave and the riddle; but the cobs, &c., that fall on the front part of the riddle pass out of range of the descending corn so quickly as to have no effect for either good or evil, and suction applied as stated has a most beneficial effect.

A plate 18 is secured to or formed on the part of the lower concave that extends back of the sheller-cone. It is located at or near the vertical center of the concave, and it extends upward. The corn, &c., tends to pass from the shelling-compartment in the direction indicated by the longer arrow in Fig. 7, or in the direction of the rotation of the cone, but, striking the plate, it is deflected in the direction indicated by the shorter arrow and deposited on the side of the riddle opposite that to which its unimpeded motion would have carried it. While the plate deflects a large quantity of grain, it has no effect on that that passes through the slots of the concave, and as this quantity is affected by the action of the cone and tends to fall somewhat to one side of the riddle it will be seen that the action of the plate is of an equalizing character.

A cross-bar is fastened in the shaker below the rear terminations of fingers 13, and it has a set of fingers 14 extending rearward above riddle 12. The fingers 14 are farther apart than are fingers 13, about twice as far in this instance, and their function is performed as follows: The fingers 13 are sufficiently close together to carry the cobs, shreds of husk, &c., and thereby give the shelled corn an unobstructed space of riddle underneath the fingers, and while it may sometimes happen that the husks in riding off the ends of the fingers will discharge the grains of corn they carry such is not always the result; but when the fingers 14 are reached the husks, &c., are sustained but partly by said fingers and tilting motion is imparted that tends to tumble the husks and cobs sidewise and entirely dislodge the corn. For instance, a wide shred of husk will ride down over fingers 13, but when it reaches fingers 14 one side only will be sustained by a finger and the other side will descend and overturn the husk. The action of the tumbling-fingers may be made more effective by imparting oscillating motion to their shaft, but ordinarily this will not be needed.

In this instance what is generically known as the "cylinder" of the sheller is really of conical form, and the shaft thereof is truly horizontal, but the means described for cleaning the riddle under the concave will apply to a sheller in which a cylinder is actually employed and in which the shaft is set somewhat obliquely. In other words, it is only

an essential preliminary to that feature of my invention that the shaft of the sheller shall be approximately horizontal, that the lower part of the concave shall have openings to permit passage of shelled corn, and that a riddle shall be located under the concave in position to receive the corn that passes through the openings.

The utility of the deflecting-plate 18 is dependent on the conical shape of the cylinder, whereby the corn, &c., are given a spiral motion that tends to discharge them in the direction and with the effect explained.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An approximately horizontal cylinder and concave sheller having openings in the lower part of its concave, a riddle below the concave, and a suction-pipe communicating directly with the space between the concave and the riddle.

2. An approximately horizontal cylinder and concave sheller having openings in the lower part of its concave, a riddle below the concave, and a suction-fan communicating with the space between the concave and the riddle through the front part of the casing.

3. An approximately horizontal cylinder and concave sheller having openings in the lower part of its concave, a riddle below the concave, and a suction-fan communicating with the space between the concave and the riddle through a side of the casing.

4. The combination, in a sheller, of an approximately horizontal cylinder, a concave located below the cylinder and having openings, a riddle below the concave, a casing for

the riddle, a suction-fan communicating with the space in the casing between the concave and the riddle, and air-admitting openings in the sides of the casing below the riddle.

5. The combination, in a sheller, of an approximately horizontal cylinder, a concave below the cylinder and having openings, a riddle below the concave, a casing inclosing the sides and front end of the riddle, a swinging flap normally closing the rear end of the space between the concave and the riddle, and a suction-fan communicating with the space between the concave and the riddle through a side of the casing.

6. In a horizontal cylinder and concave sheller having a suction-fan the down-leg of which is used to clean the shelled and separated corn, a tube as 9 connecting the down-leg of the fan with the space between the concave and the riddle.

7. A horizontal cylinder and concave sheller having a suction-fan communicating with the space in the casing between the concave and the riddle and also having a downward-inclined shelf above the opening and inside the casing.

8. In a horizontal cylinder and concave sheller, the combination, with the cylinder and the concave, of a vertical stationary deflecting-plate situated lengthwise of the lower, inner surface of the concave immediately in the rear of the rear end of the cylinder.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

WILLARD C. ROWE.

Attest:

C. M. LYTLE,
L. P. GRAHAM.