

E. SKELLY.
Grain Cleaner.

2 Sheets—Sheet 1.

No. 106,627.

Patented Aug. 23, 1870.

Fig. 1.

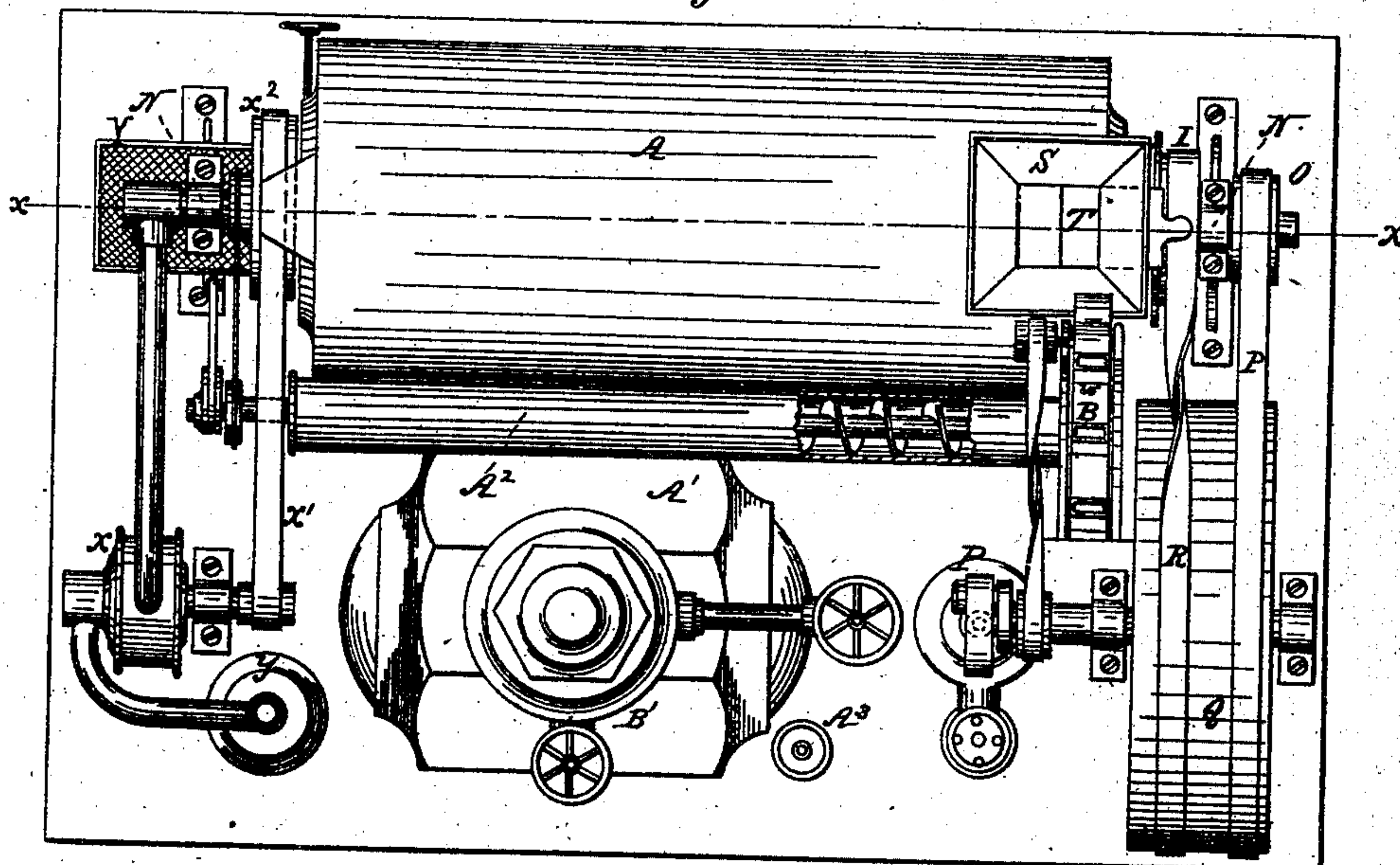
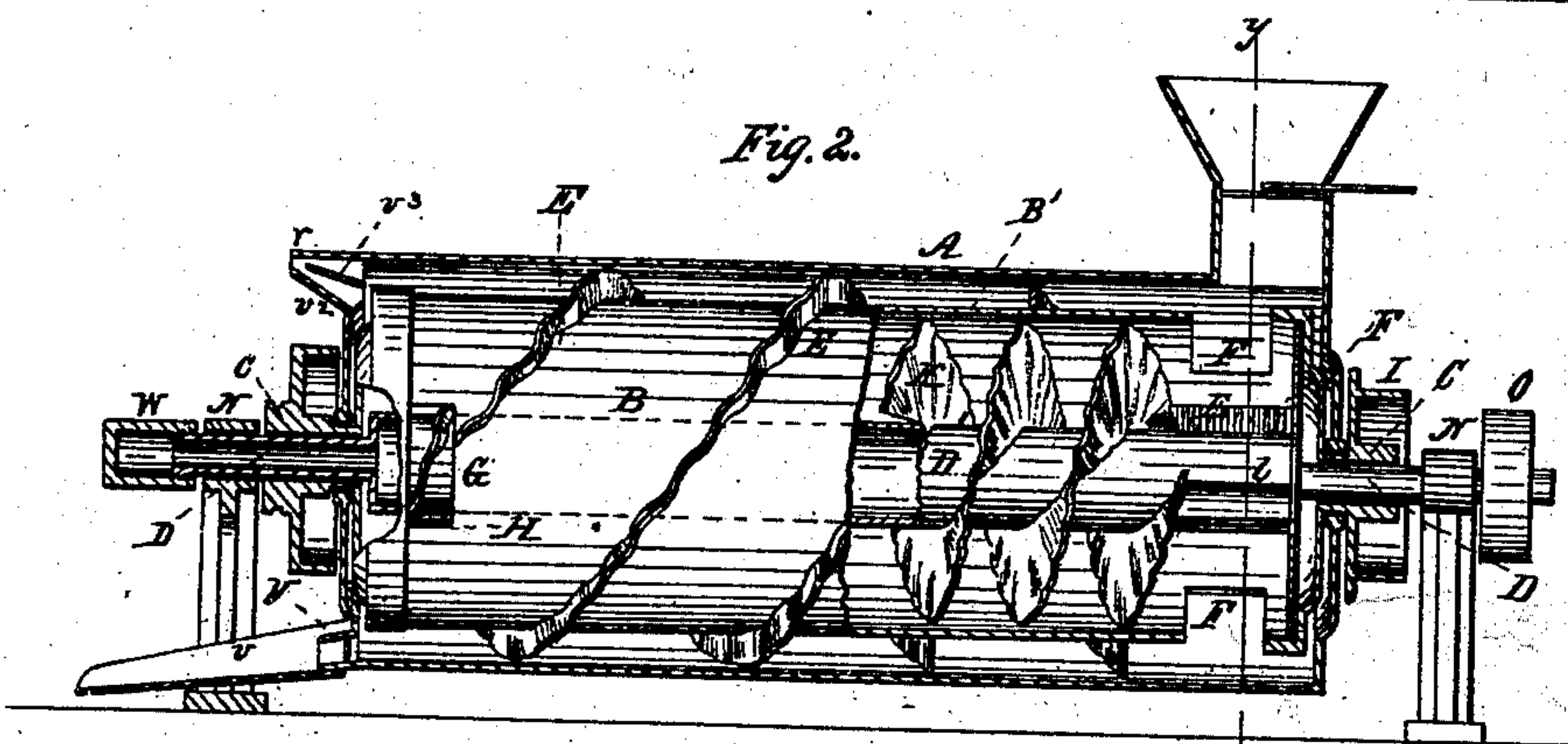


Fig. 2.



Witnesses:

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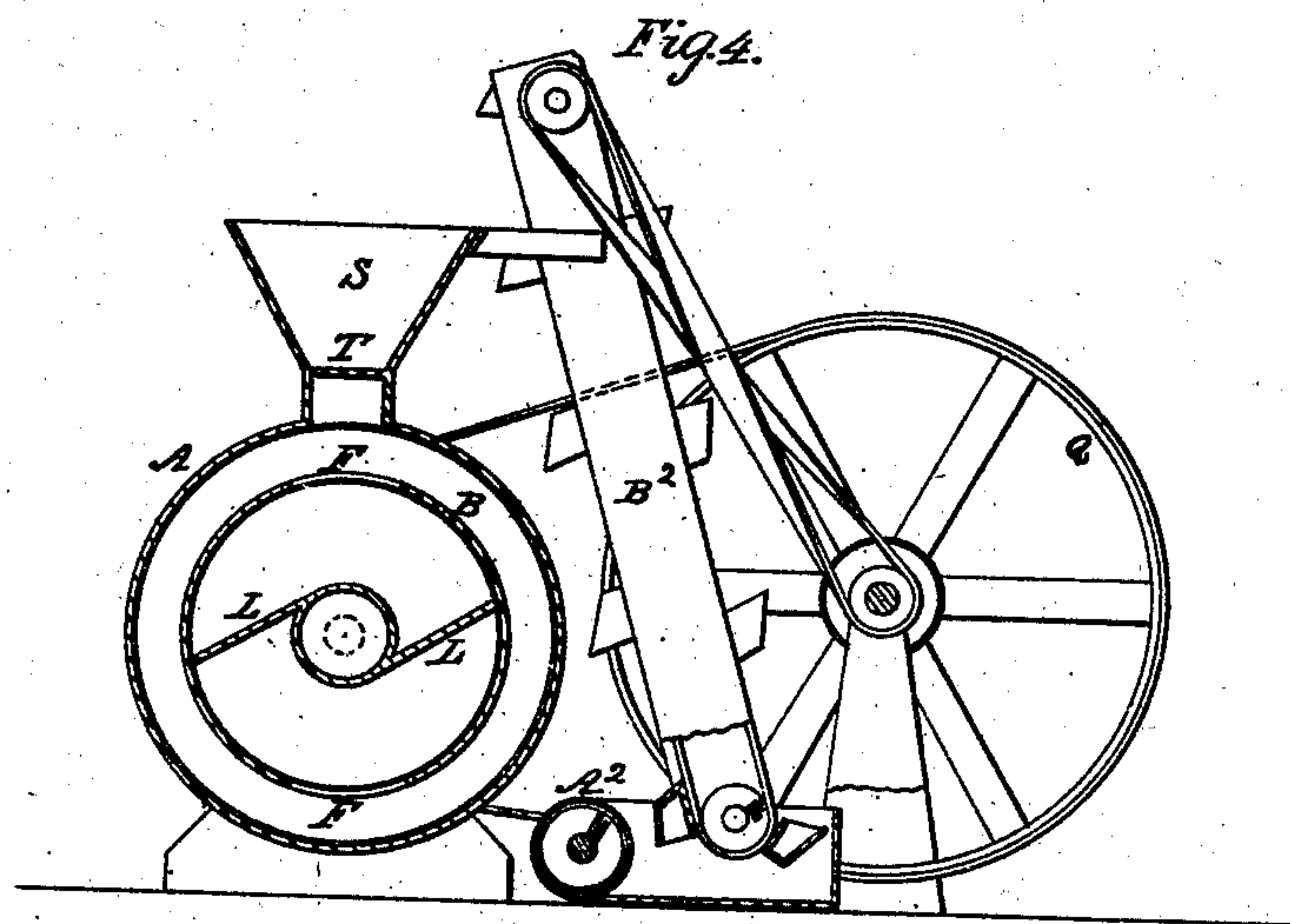
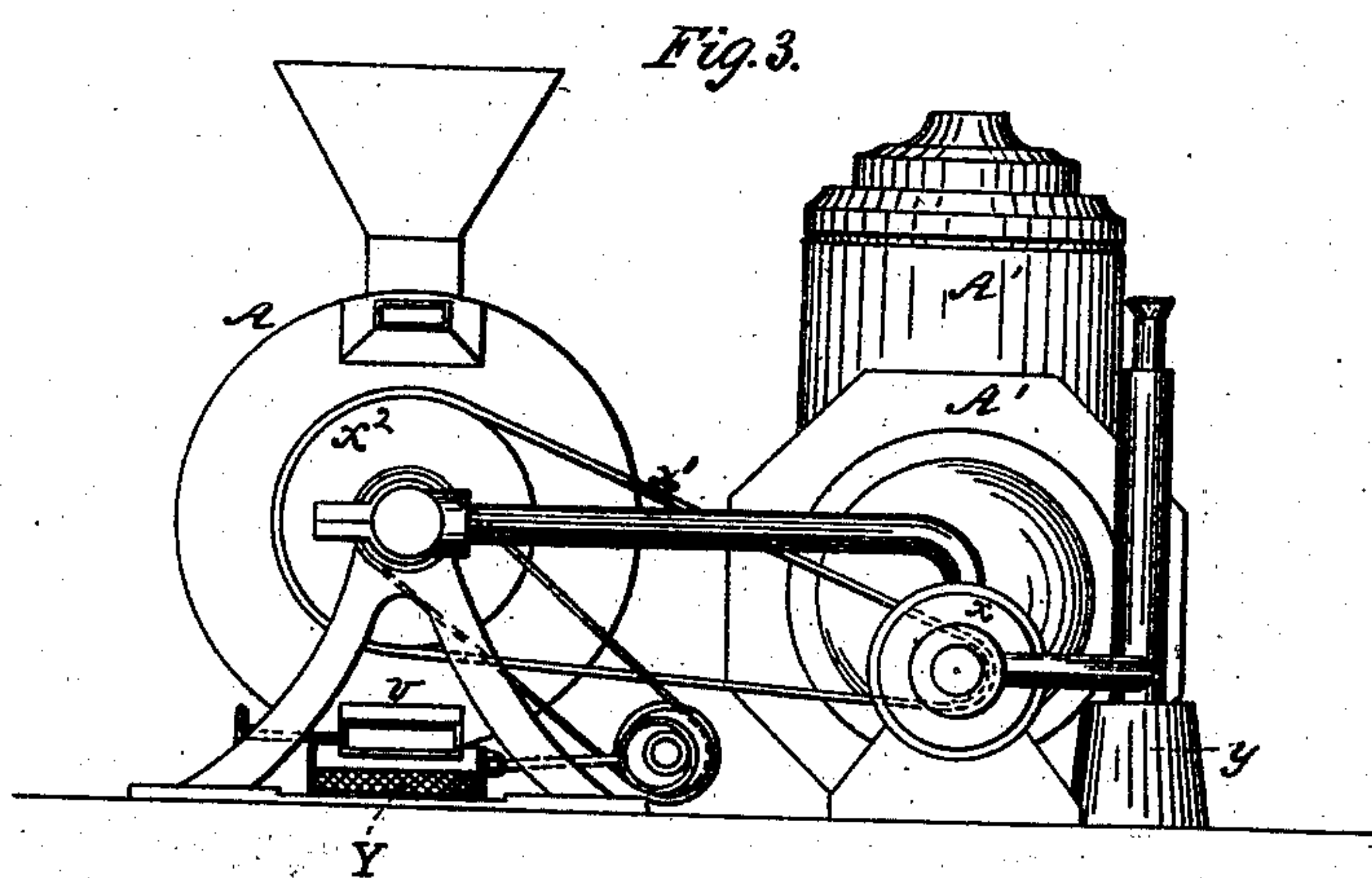
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E. SKELLY.
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EVAN SKELLY, OF PLAQUEMINE, LOUISIANA.

Letters Patent No. 106,627, dated August 23, 1870.

IMPROVEMENT IN MACHINES FOR DECORTICATING AND DRYING GRAIN.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, EVAN SKELLY, of Plaquemine, in the parish of Iberville and State of Louisiana, have invented a new and improved Machine for Decorticating and Drying Grain; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in machinery for decorticating and drying grain; and

It consists, mainly, in an arrangement within a hollow cylinder of another hollow cylinder having a corrugated spiral flange for rubbing the grain, within which interior cylinder is another spiral rubbing screw or propeller, to which the grain is conveyed, and by which it is acted upon while either steam, hot or cold air, is admitted through the axle or shaft of the propeller, the operation being performed on batches of grain admitted through the outer cylinder and retained as long as required, according to the nature of the grain.

The invention also comprises the combination with the above for a preparatory action on the grain, of an air-tight receptacle, into which a batch of grain may be admitted, and a partial vacuum formed therein by a pump, after which, the air being admitted suddenly, will detach the chaff, dust, and other light matter, the operation being repeated as many times as required. From this apparatus the grain may be conveyed by spouts, a conveyer, and an elevator, to the decorticator.

The invention also comprises the combination, with the decorticator, of a heater and a fan-blower, for heating the air and forcing it into the space containing the grain.

Figure 1 is a plan view of my improved apparatus.

Figure 2 is a section of the same, taken on the line $x x$ of fig. 1.

Figure 3 is an end elevation; and

Figure 4 is a section on the line $y y$ of fig. 2.

Similar letters of reference indicate corresponding parts.

A represents a hollow cylinder, of hard cast metal or other suitable substance, arranged horizontally on a suitable base.

B is another hollow horizontal cylinder, arranged within A, and fitted with sleeves C at the ends, to turn loosely on the hollow shaft D.

This drum is provided with the corrugated spiral vane E, and it has one or two openings, F G, through the side, at the ends.

At the openings G scrapers H are attached, for scraping the grain from the space between the cylinders A and B to the interior of B as it is revolved,

it having a pulley, I at one end, on which a belt may work to turn it.

The hollow shaft is considerably enlarged within the cylinder B, and it is provided with a wide corrugated spiral vane or blade, K, for carrying the grain received into the cylinder B, at G, to the opposite end, where two scrapers or blades, L, are arranged on the shaft, tangentially to it, for throwing the grain back through the openings F to the space between the two hollow cylinders, where it is again acted on by the vane E.

F¹ is a corrugated disk on the shaft, against which the grain will be rubbed as it is thrown out from cylinder B.

This shaft extends through the sleeves C, and is arranged in bearings N, by which it is supported.

O is a pulley on one end, for the application of a belt for driving it from the drum Q.

R is the belt, which drives the cylinder B; it is crossed, and turns it in the direction opposite to that in which the shaft D and blade K turn.

S is a hopper, for supplying the grain to the cylinder A.

T is a gate, for regulating the same.

U is a discharge-spout from the bottom of cylinder A, leading to a reciprocating screen, V, which may discharge into any receptacle, or it may lead into any approved polishing-machine for polishing the grain after it has been hulled or dried.

V¹ is a spout, discharging from the upper side of one end of cylinder A, for the escape of the air forced in to carry off the dust, chaff, and the like.

The lower wall, V², of this spout descends backward from the outer end at about forty-five degrees, and a dividing-plate, V³, is arranged in it to divide the blast, which, being strongest at the top, the grain which may be carried up by it will fall over the end of the said plate, (which is shorter than the bottom,) on to the latter and return to the cylinder.

The pipe-connection W is provided at the open end of the shaft D for the admission of hot or cold air from a fan-blower, x , and a heater, y , and it may have an opening or a connection for the attachment of a steam-pipe for the admission of steam for drying the grain.

The shaft D is closed at the opposite end, and has perforations at or about the center for the steam or air to escape into the space containing the grain.

The fan-blower is worked by a belt, x^1 , set in motion by a pulley, x^2 , on the shaft D.

A¹ is an air-tight vessel of metal or other substance, arranged in connection with the cylinder A. It is provided with a supply-pipe, B¹ and a stop-valve, air-exhaust pipe, C¹, leading to a pump, D¹, and also provided with a stop-valve. It is also designed to be pro-

vided with an escape-spout at the bottom, suitably arranged to let the grain escape to a receptacle below, from which it is to be elevated to the conveyer A², which spout may have a gate for which the hand-wheel A³ may be supposed to be the operating device.

This conveyer is to be arranged to discharge into the elevator B², which empties into the hopper S.

The elevator is operated by a belt, C², from the shaft of drum Q, and the pump is driven by a crank thereon.

The operation of this improved apparatus is as follows:

A batch of grain is placed in the air-tight vessel, either through the supply-pipe, B¹, or any other suitable way; then the passage is closed; the pipe leading to the air-pump is then opened and the pump set in motion for creating a partial vacuum in the said air-tight vessel; then the pipe leading to the pump is closed and the one B¹ opened, letting the air suddenly rush against the grain; this detaches or partially detaches the hulls from the kernels.

After this the passage from the bottom of the vessel A¹ is opened, and the grain escapes to a receptacle below, from which it is to be raised by any means to the conveyer A², and thence through the elevator B² to the cylinder A; here it is acted on by the corrugated spiral screw-blade E, and conveyed to the opposite end, where it is taken by the scrapers H through the openings G into cylinder B, and exposed to the action of the corrugated spiral blade or propeller K, which works it back again to the other end, and against the corrugated disk F¹, until thrown out through the passages F to the cylinder A by the tangential blades L; here it is acted on as before by the blade E, and these operations are continued as long as required for removing the hulls by the frictional action of the surfaces of the several parts acting on it.

The condition of the grain may be determined at any time by opening the gate at the spout U, and allowing a sample to escape.

The fan-blower is kept in operation during this time, and the hulls, dust, and other matter thereby expelled through the spout V¹.

In case the grain being acted on requires it, the steam-jet is applied also, but this is only required when operating upon pease, beans, and the like; also corn when being hulled for hominy; and, when steam is used, it is only used in sufficient quantity to slightly warm and moisten the surface of the grain.

When rice and coffee are being acted on the steam-jet is not used. When rice is being dressed it is delivered, after sufficient action in the decorticator, into a revolving screen with a blower attached, and then passes into a burnisher of the same form as the de-

corticator, but without the corrugations of the blades, which are made smooth and polished for polishing the rice.

For small family mills the air-vessel A¹ and the pump may be dispensed with, as the decorticator, blowing and steaming apparatus, and the necessary screens will produce good family rice and large hominy.

It will be seen that this apparatus is very simple and compact; that it can be made very cheaply, and is not liable to get out of order; also that, as it acts entirely by frictional contact of surfaces, the grain will not be cut or broken, and the operating surfaces are so arranged that there can not be any grinding of the grain.

Having thus described my invention,

I claim as new and desire to secure by Letters Patent—

1. A grain-decorticator, consisting of the cylinders A B and the spiral corrugated vanes or blades E K, combined, arranged and operating substantially as herein described.

2. The combination, with the cylinder B and the spiral blade K, of the corrugated disk F¹, and the blades L, substantially as specified.

3. The combination, with the cylinders A B and the spiral vanes, of a hollow perforated shaft O and an air-heating and injecting apparatus X Y, the said hollow shaft being also arranged for the admission of a steam-jet, all substantially as specified.

4. The combination, with a hollow cylinder B, having the corrugated spiral vane on the exterior, of a spiral conveyer or propeller K arranged within the said cylinder, and the latter provided with openings G F, for the admission and discharge of the grain, all substantially as specified.

5. The combination, with the cylinders A B, of the divided discharge-spout V¹, arranged substantially as specified.

6. The combination, with the decorticating cylinders and screw-blades, of the screen V, substantially as specified.

7. The mode of detaching the hulls and chaff from the kernels of grain by subjecting it to the action of air suddenly admitted to it while contained in a vacuum, substantially as specified.

8. The combination, with the decorticating cylinders A B and the adjuncts thereof, of the vacuum vessel A¹, the air-pump D¹, substantially as specified.

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Witnesses:

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