

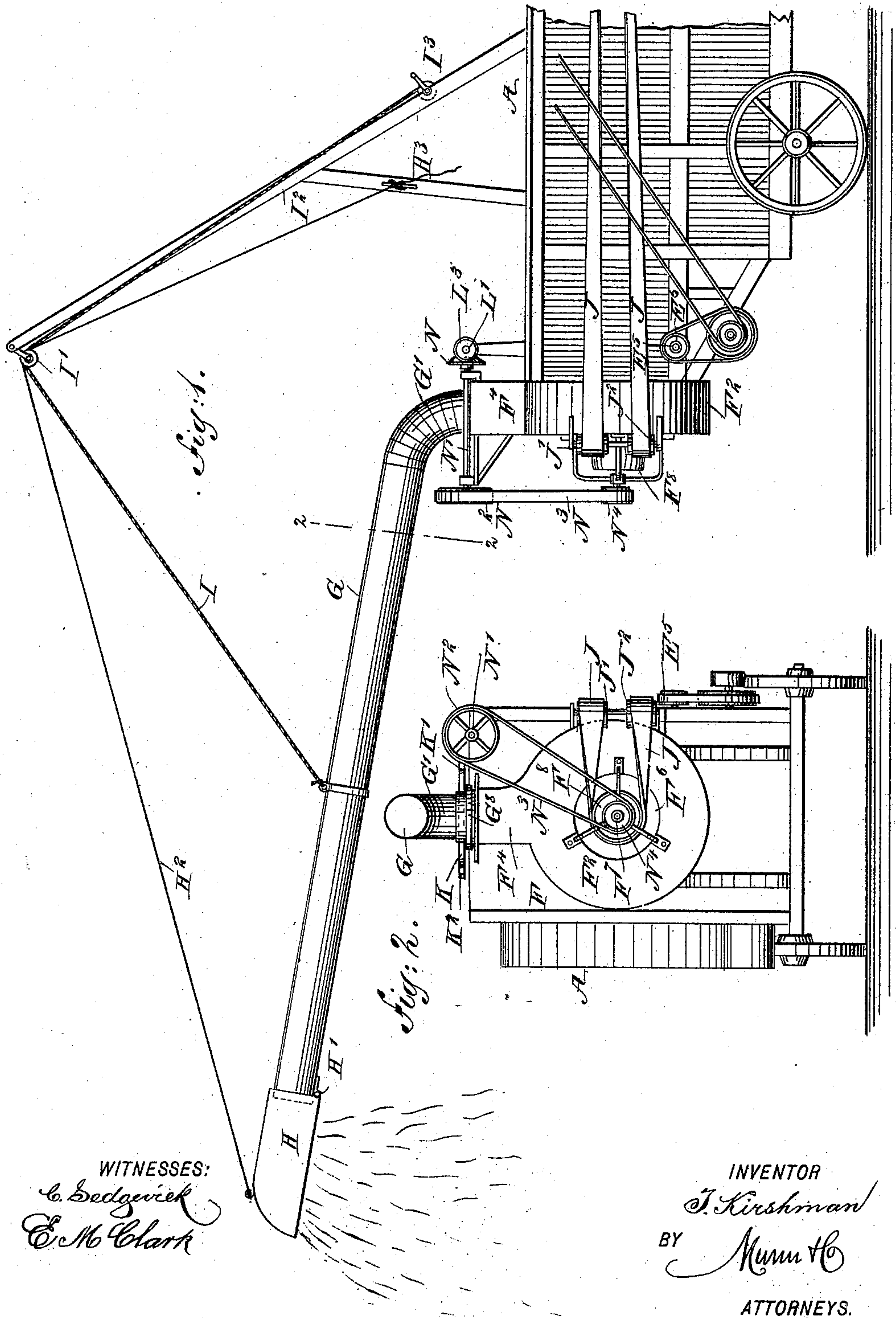
(No Model.)

3 Sheets—Sheet 1.

T. KIRSHMAN.
PNEUMATIC STACKER.

No. 540,102.

Patented May 28, 1895.



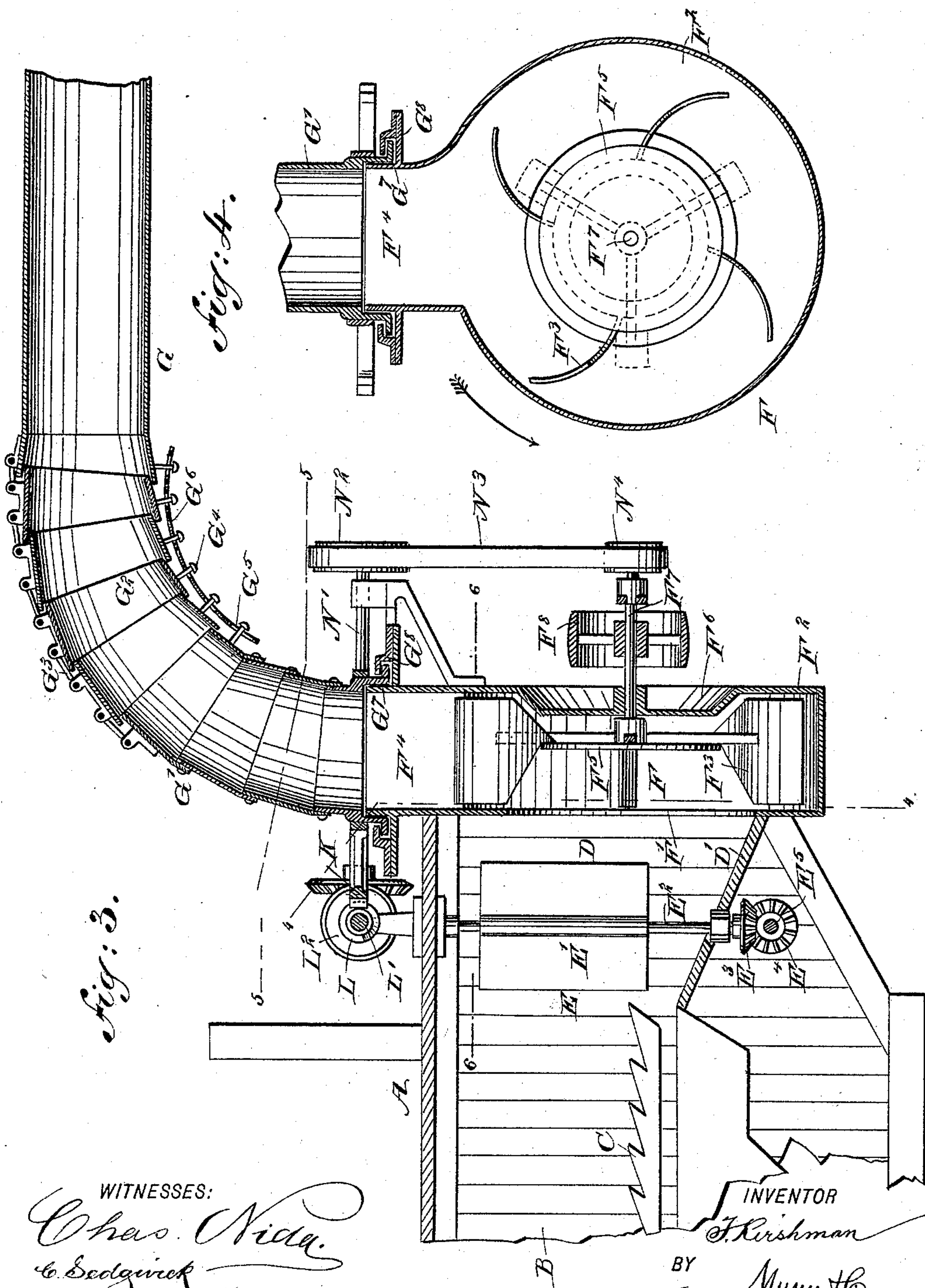
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WITNESSES:

WITNESSES:
Chas. Nida.
C. Sedgwick

INVENTOR

F. Krishnan

BY

ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

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Fig. 6.

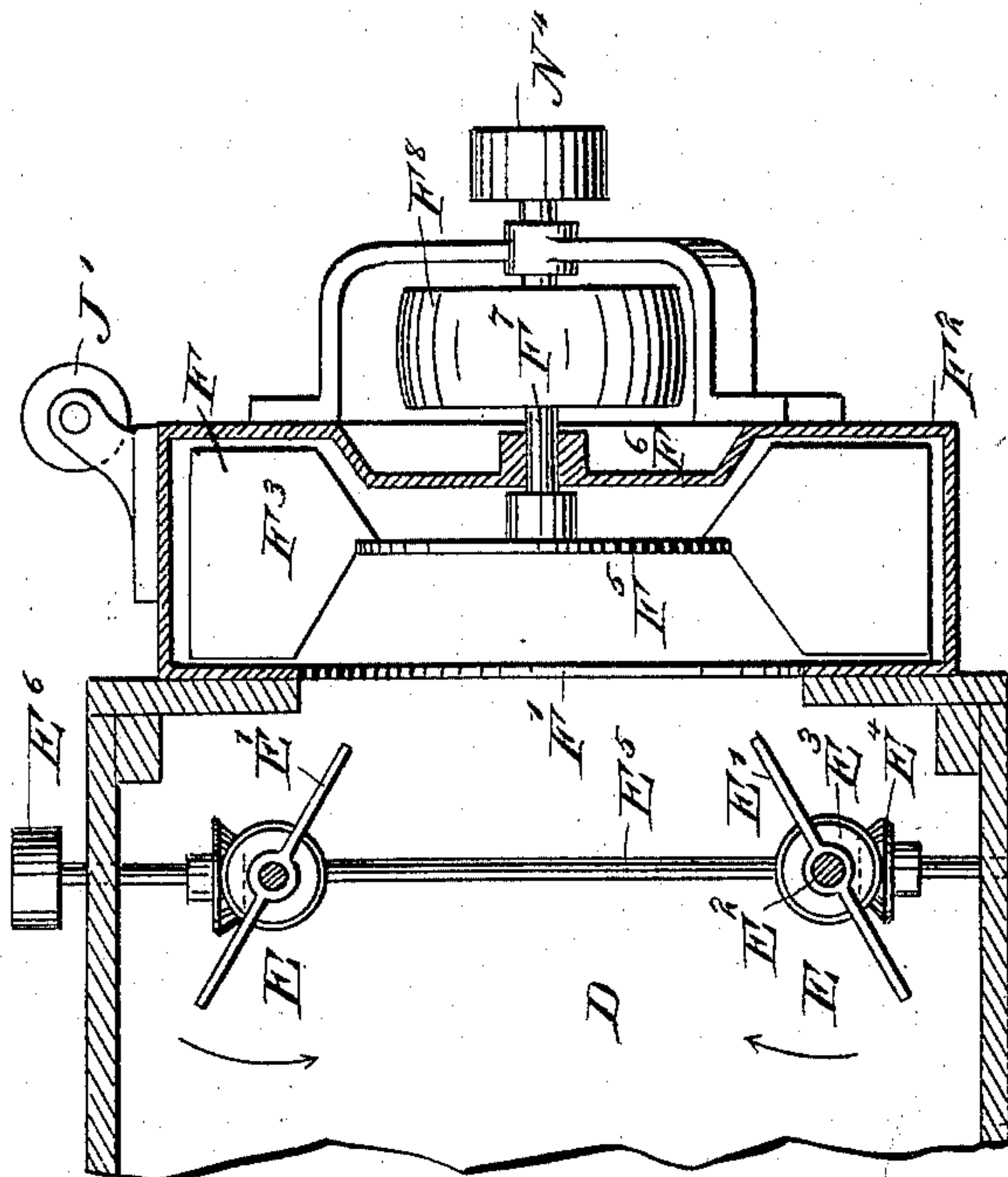
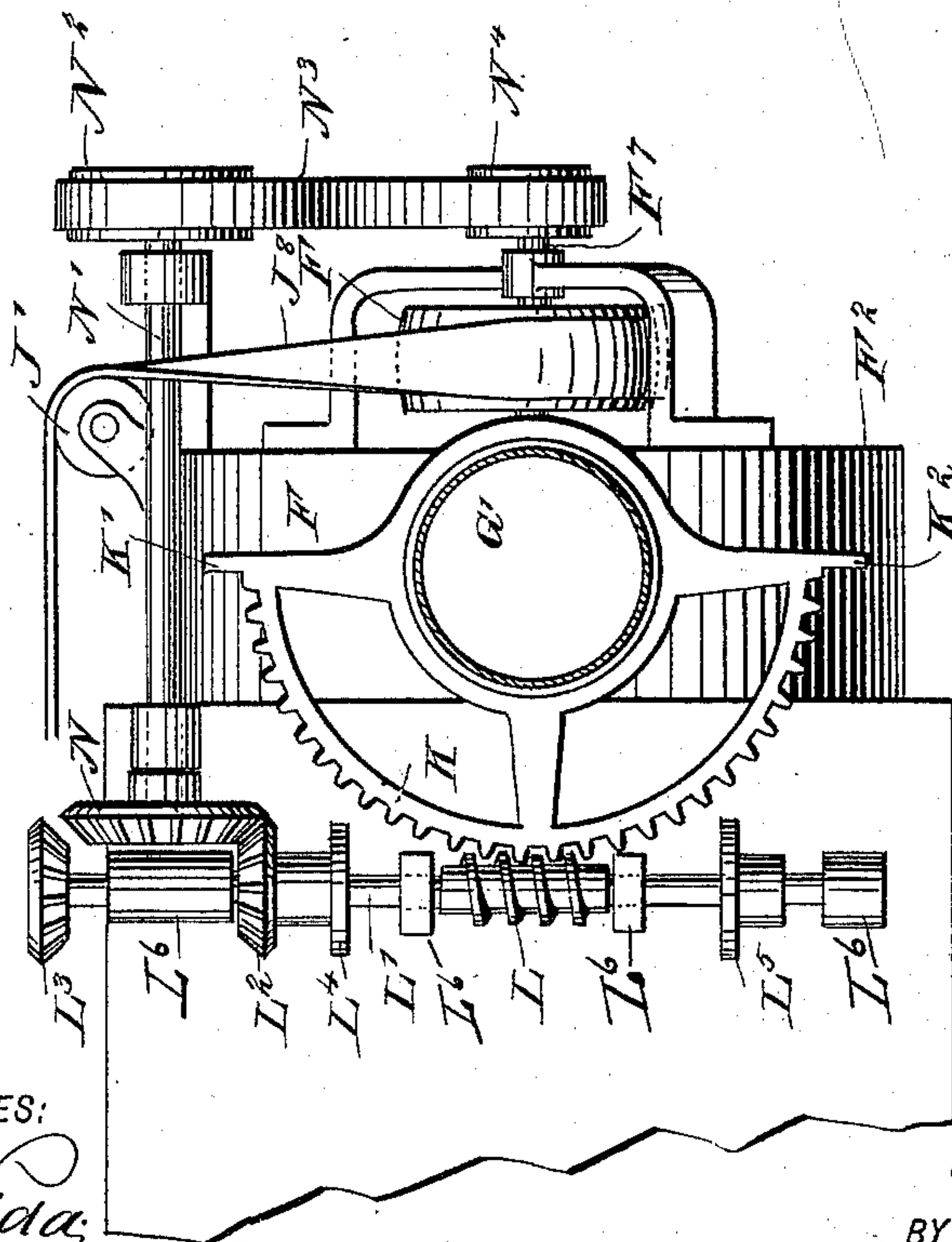


Fig. 5.



WITNESSES:

Chas. Nida
C. Sedgwick

INVENTOR

T. Kirshman

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

THOMAS KIRSHMAN, OF CALIFORNIA, MISSOURI, ASSIGNOR TO HIMSELF, AND
THE HARRISON MACHINE WORKS, OF BELLEVILLE, ILLINOIS.

PNEUMATIC STACKER.

SPECIFICATION forming part of Letters Patent No. 540,102, dated May 28, 1895.

Application filed November 4, 1893. Serial No. 489,975. (No model.)

All whom it may concern:

It is known that I, THOMAS KIRSHMAN, of California, in the county of Moniteau and State of Missouri, have invented a new and improved Pneumatic Stacker, of which the following is a full, clear, and exact description:

The invention relates to thrashing machines, and its object is to provide a new and improved stacker, which is comparatively simple and durable in construction, very effective in operation, and arranged to readily carry the straw, chaff or other like material from the discharge end of the thrashing machine to any desired place.

The invention consists principally of an exhaust fan arranged vertically at the outlet of the thrashing machine, the axis of the fan extending longitudinally of the machine.

The invention also consists of certain parts and details and combination of the same, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement as applied. Fig. 2 is an end elevation of the same with part in section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged sectional side elevation of the improvement. Fig. 4 is a transverse section of the same on the line 4 4 of Fig. 3. Fig. 5 is a sectional plan view of the same on the line 5 5 of Fig. 3, and Fig. 6 is a similar view of the same on the line 6 6 of Fig. 3.

The thrashing machine A on which the stacker is applied, is of the usual construction and is provided with the usual casing B, in the rear end of which operates the straw rack C, discharging into a chamber D forming an extension to the casing B, as is plainly illustrated in Fig. 3. In this chamber D operate two revoluble beaters E adapted to guide the material through the opening F' in the casing F², to the exhaust fan F, secured on the outer end of the chamber D and having its outer end closed, as is plainly illustrated in the drawings.

The inclined bottom D' of the chamber D

leads to the lower edge of the opening F' and the two beaters E are placed a sufficient distance apart to readily guide the material discharged by the rack C on a substantially direct line through the casing D to the said opening F', to pass through the fan between the wings F³ thereof to be finally discharged through the outlet F⁴ into the elbow G' of a pipe G, extending rearward from the machine A, as is plainly illustrated in Fig. 1, to carry the material to the stack.

It will be observed that the vertical fan revolves in a plane that extends transversely of the machine, that is, the axis of the fan is disposed longitudinally of the machine. In consequence thereof, as will be seen best in Fig. 3, the axis of the fan is substantially coincident with the line of feed, that is, the material after passing over the straw racks C, proceeds in the same direction between the beaters E to the fan casing, so that the material after leaving the straw racks, proceeds in a substantially direct line to the eye of the fan casing, without materially deviating from its original path of travel.

The extreme outer end of the pipe G is provided with a deflector H, hinged at H' to the pipe on the outer surface thereof so as to be adjusted to any desired angle, and open at the bottom, so that the material passing through the pipe is discharged downward by the deflector H. The pipe G is supported at or near its middle on a chain or rope I, extending upward and forward to pass over a pulley I', held on the upper end of a derrick I², arranged on the top of the casing B of the thrashing machine A. The rope I winds on a drum I³ of any approved construction and arranged on the derrick so that the pipe G may be swung up and down according to the desired place at which the material is to be deposited.

The deflector H is connected at its free end, on top, with a rope H², also extending over a pulley on the upper end of the derrick I² to then extend downward to be fastened on the cleat H³ held on the derrick, as is plainly shown in Fig. 1.

In order to raise or lower the pipe G it is necessary that some of the sections G² in the elbow G' should be made loose, as is plainly

illustrated in Fig. 3, the said sections being connected with each other at their upper ends by links G^3 , and being provided at their lower ends with pins G^4 extending through elongated slots G^5 formed in a curved bar G^6 , supported on the heads of the said pins. By this arrangement the pipe G may be raised or lowered, the sections G^2 giving accordingly, without danger of becoming detached.

In order to permit of turning the pipe G to the right or left, I provide the lowermost section of the elbow G' with an annular flange G^7 mounted to turn in a suitable bearing G^8 , supported on the outlet F^4 of the fan casing F^2 .

The material discharged into the fan passes but a short distance, say about half-way of the depth of the fan casing, to then engage a circular disk or plate F^5 formed or secured centrally on the fan wheel, the fan blades extending both in advance and in the rear of the said plate, the latter being somewhat less in diameter than the opening F' , and preventing material from clogging up the fan wheel arms and the wings F^3 of the fan, and at the same time guiding the material readily outward through the outlet F^4 into the pipe G . The inner edges of the wings or fan blades F^3 are beveled in the direction from the edge of the opening F' to the edge of the plate F^5 , as shown in Fig. 3. By this arrangement of the fan a considerable suction space is formed in the casing F^2 not obstructed by incoming material, so that the material will have free and direct access to the entire surface of the plate F^5 and the fan will successfully draw the material from the chamber D into the casing and throw it, and discharge it through the outlet F^4 , into the pipe G . This joint action of the suction and the wings throwing the straw, and the force of the blast make the discharge of the straw complete with less power than can be done otherwise. Furthermore, the force of the air passing up through the material into the pipe G forces the material through the pipe G and the deflector H onto the stack.

As illustrated in Fig. 3, the outer end of the casing F^2 is bent inward or dished, as at F^6 , directly opposite the disk or plate F^5 , to reduce the space in the casing between the said plate and the outer face of the casing. On the shaft F^7 carrying the wings F^3 of the fan is secured a pulley F^8 outside of the casing F^2 , and over the said pulley passes a belt J also passing over idlers J' , J^2 , arranged on one side of the casing F^2 and serving to guide the said belt J along one side of the thrashing machine A to a pulley preferably located on the cylinder shaft of the thrashing machine. (Not shown.) By this arrangement the fan F is driven directly from the cylinder, but I do not limit myself to the means shown and described for transmitting power from the cylinder to the shaft of the fan.

The revoluble beaters E are each provided with diametrical wings E' , secured on a vertically disposed shaft E^2 , journaled in suitable bearings in the chamber D , the lower

end of each shaft E^2 extending through the inclined bottom D' , to carry on its lower end a bevel gear wheel E^3 , in mesh with a bevel gear wheel E^4 , secured on a transversely-extending shaft E^5 , journaled in suitable bearings in the sides of the casing B . On one outer end of this shaft E^5 is secured a pulley E^6 , connected by a belt or other means with one of the driving pulleys of the thrashing machine, so that a rotary motion is given to the said shaft E^5 , and this motion is transmitted by the bevel gear wheels E^4 , E^3 to the shafts E^2 , carrying the wings E' , so that the beaters revolve toward each other and in the direction indicated in Fig. 6, as long as the machine is in operation.

In order to impart a continuous vibrating motion to the discharge pipe G , the following device is provided: On the lowermost section of the elbow G' of the said pipe is secured a segmental worm wheel K , in mesh with a worm L having a sliding connection, yet held to rotate with a transversely-extending shaft L' , mounted to turn in suitable bearings arranged on the top of the extension chamber D , two of these bearings serving also to prevent longitudinal movement of the worm L . On the shaft L' are rigidly secured the two bevel gear wheels L^2 and L^3 , adapted to alternately engage a bevel gear wheel N , secured on the inner end of a longitudinally-extending shaft N' , journaled in suitable bearings held on the casing F^2 of the fan F . It will be understood that the wheel N is of such a size that it can engage only one of the wheels L^2 and L^3 at a time. The outer end of this shaft N' carries a pulley N^2 over which passes a belt N^3 , also passing over a pulley N^4 secured on the extreme outer end of the fan shaft F^7 , so that when the latter is rotated as above described, a rotary motion is transmitted by the pulleys N^4 , N^2 , and belt N^3 to the shaft N' , and the latter by either of the bevel gear wheels L^2 or L^3 , rotates the shaft L' either to the right or to the left, according to whatever gear wheel L^2 or L^3 is in gear with the bevel gear wheel N .

In order to shift the shaft L' automatically so as to alternately engage the said gear wheels L^2 and L^3 with the pulley N , the following device is provided: On the segmental worm wheel K are arranged the projections or lugs K' and K^2 , located diametrically opposite each other at the ends of the teeth of the segmental gear wheel, as is plainly shown in Fig. 5. Now, when the shaft L' rotates in one direction, the worm L causes the segmental worm wheel K to turn until finally the respective lug K' or K^2 moves in engagement with a collar L^4 or L^5 respectively, both secured on the shaft L' . In doing so, the respective lug presses the corresponding collar L^4 or L^5 to shift the shaft L' transversely, either to the right or left, to move the corresponding bevel gear wheel L^2 or L^3 out of mesh with the gear wheel N , and the other bevel gear wheel L^3 or L^2 in mesh. As the

gear wheel N rotates continuously in one direction, the motion of the shaft L' is thus reversed, and consequently the worm L will now turn the segmental gear wheel K in the opposite direction until the other lug again moves the corresponding collar as above described. Thus, it will be seen that a continuous oscillating motion is given to the segmental gear wheel K, and as the latter is secured on the base section of the elbow G' of the pipe G, the latter swings to the right and left so as to continuously discharge the material by the deflector H to a different place on the stack. As the stack increases, the height of the pipe G is increased by the operator manipulating the drum I³ and the rope H².

When the machine is in operation, the beaters E, by their wings E' rotating toward each other, compress the material and force it through the chamber D, and through the opening F' into the casing F² until the further inward movement of the material is prevented by the deflecting plate F⁵, which guides the material outward to the outlet F⁴ and to the pipe G, the material being forced through the latter by the air blast, as above described. By this arrangement the straw and chaff are not entangled in the arms or wings of the fan, but are continuously forced outward through the pipe G, so that no clogging whatever takes place.

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

1. The combination, with a thrashing machine having a discharging opening or outlet at its rear end, which end is otherwise closed, of a stacker consisting of a vertically disposed fan secured upon the rear end of the machine structure, with its shaft in line with said structure, and its eye or ingress opening over or co-incidental with said discharging opening and thus communicating with the interior of the machine, and an egress opening developing into a discharging trunk or chute, whereby the straw and chaff are drawn from within the machine through said opening or eye into the fan casing on a substantially direct line from the straw racks, and discharged thence through said trunk or chute.

2. The combination, with a thrashing machine having a discharging opening at its rear end, of a vertically disposed fan secured to the rear end of the machine over said opening, whereby said opening becomes the eye of the fan, into which the straw and chaff from the machine are discharged and may thence be driven from the fan into and through an appropriate discharging trunk or chute.

3. A stacker, provided with an exhaust fan arranged at the outlet of the thrashing machine, and having a central plate arranged approximately midway in the casing, the inlet opening or eye of the fan being at least equal in diameter to the said plate, so as to form a throat affording free access of the material to the entire surface of the plate, substantially as described.

4. A stacker, provided with an exhaust fan arranged at the outlet of the thrashing machine, and provided with a central plate arranged approximately midway in the casing and revolving with the fan, said plate being smaller than the outlet opening of the thrashing machine, and the inner edges of the fan blades being beveled substantially in the direction from the edge of the said opening to the edge of the plate, substantially as described.

5. A stacker, comprising a casing or chamber adapted to receive the material and provided with an outlet, beaters located in the said chamber laterally of the outlet to guide the material toward the same, a discharge pipe connected to the outlet, and a fan located intermediate of the beaters and the discharge pipe, at the outlet of the said chamber and in the path of travel of the material, substantially as described.

6. The combination, with a thrashing machine having a discharging opening or outlet at its rear end, of a discharging pipe connected to the outlet, two beaters positioned respectively on opposite sides of said outlet and revolving toward each other, and a fan located intermediate the beaters and the discharging pipe, substantially as set forth.

7. A stacker, provided with a discharge pipe formed with an elbow mounted to turn, and having loose sections, links connecting the upper ends of the loose sections, pins projected from the said sections, and a curved bar supported by the said pins and provided with slots for the reception of the pins to permit of raising and lowering the pipe without disconnecting the sections, substantially as shown and described.

8. A stacker, provided with a discharge pipe having loose sections, links connecting the said loose sections, pins projecting from the said sections, and a curved bar having slots for the reception of the said pins, substantially as described.

THOMAS KIRSHMAN.

Witnesses:

HENRY SPRING,
GEORGE A. HARVEY.

It is hereby certified that in Letters Patent No. 540,102, granted May 28, 1895, upon the application of Thomas Kirshman, of California, Missouri, for an improvement in "Pneumatic Stackers," was erroneously issued to Harrison Machine Works, as owner of the entire interest in said invention; that said Letters Patent should have been issued to the inventor *Thomas Kirshman and the Harrison Machine Works, jointly*, said Harrison Machine Works being the assignee of part interest only in said patent, as shown by the record of assignments in this Office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 25th day of December, A. D., 1900.

[SEAL.]

F. L. CAMPBELL,
Assistant Secretary of the Interior.

Countersigned:

C. H. DUELL,
Commissioner of Patents.