

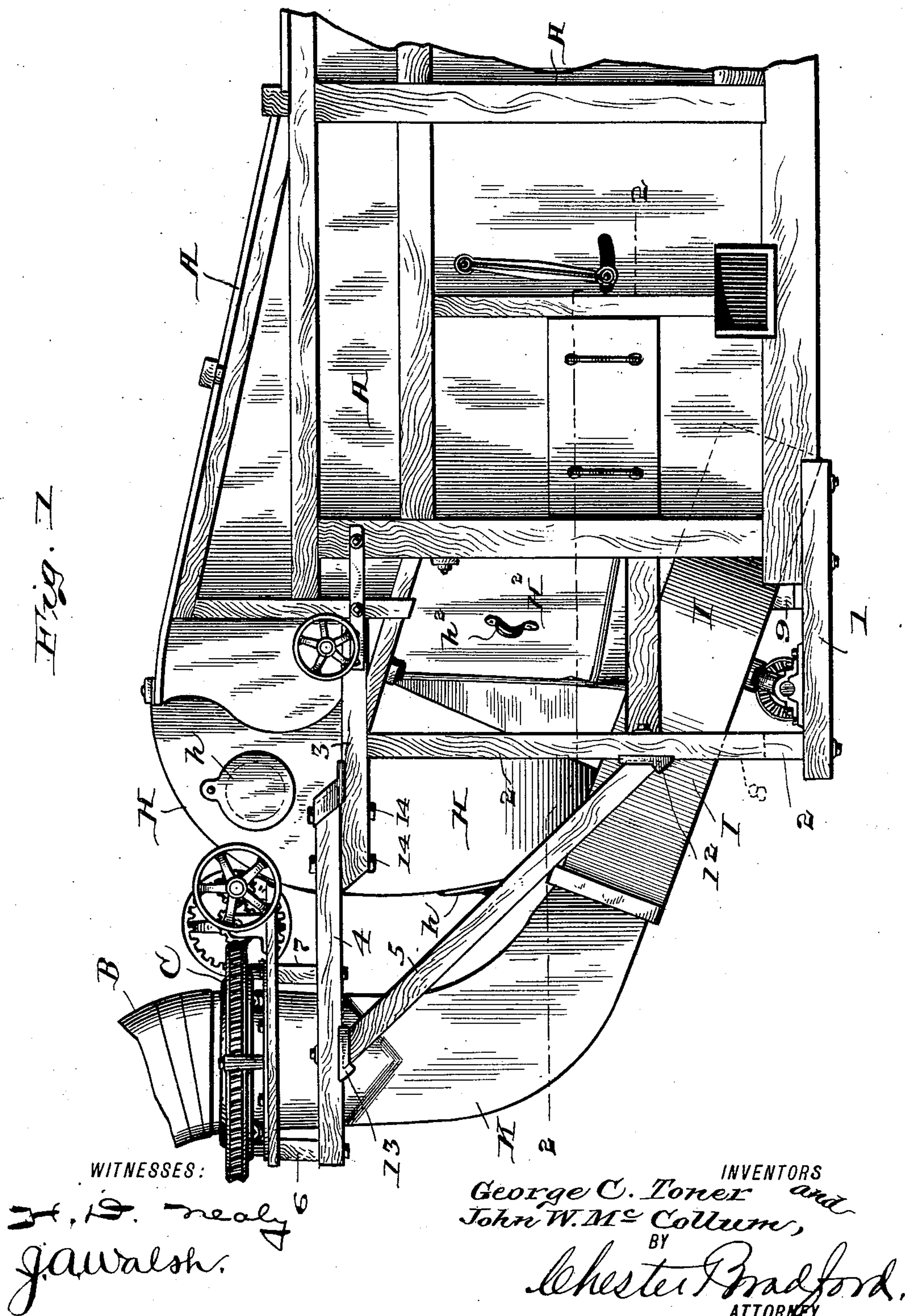
(No Model.)

4 Sheets—Sheet 1.

G. C. TONER & J. W. McCOLLUM.
PNEUMATIC STRAW STACKER.

No. 592,673.

Patented Oct. 26, 1897.



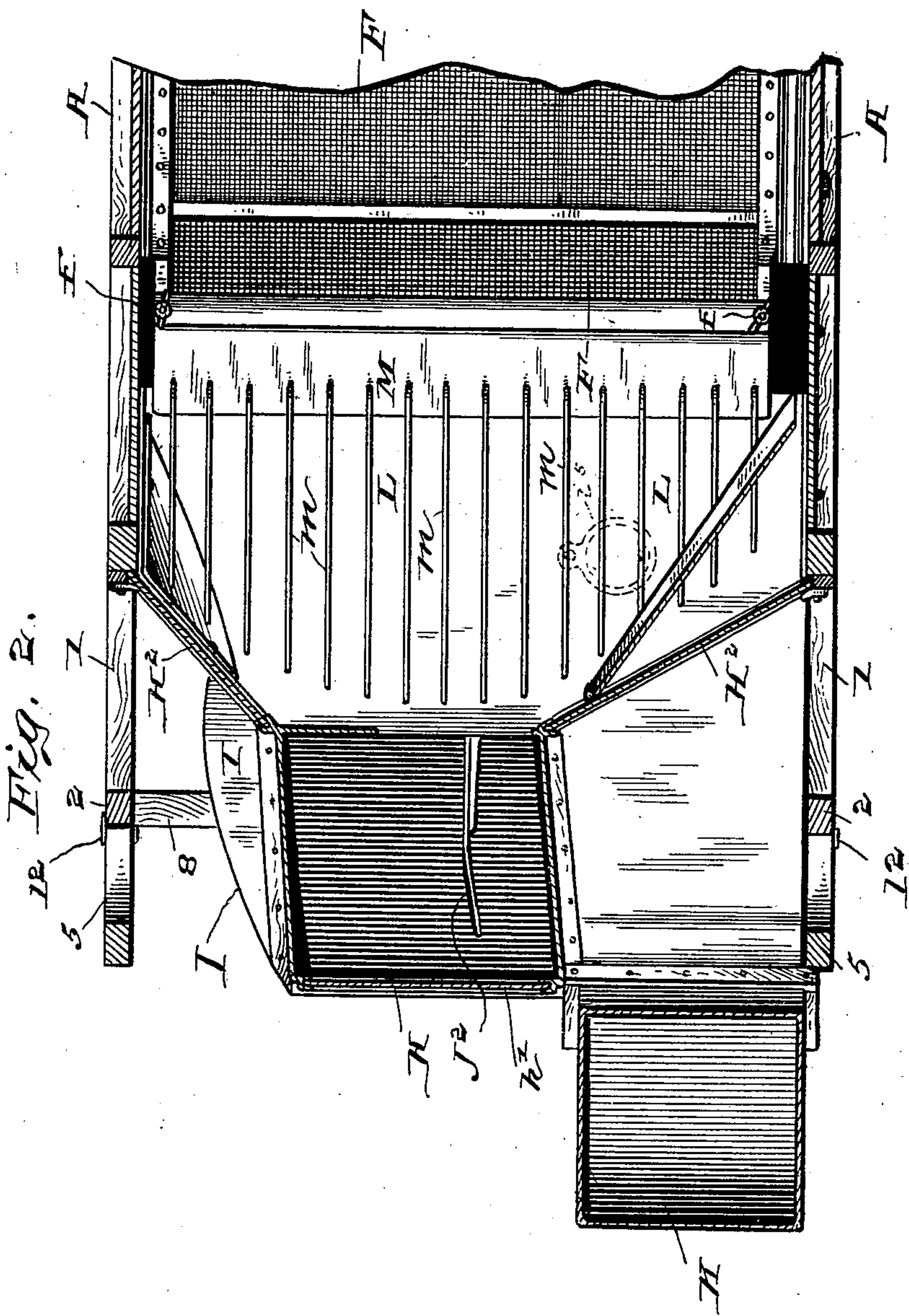
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WITNESSES:

H. B. Neely.
J. A. Walsh.

INVENTORS *and*
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John W. McCollum,
BY
Chester Bradford,
ATTORNEY.

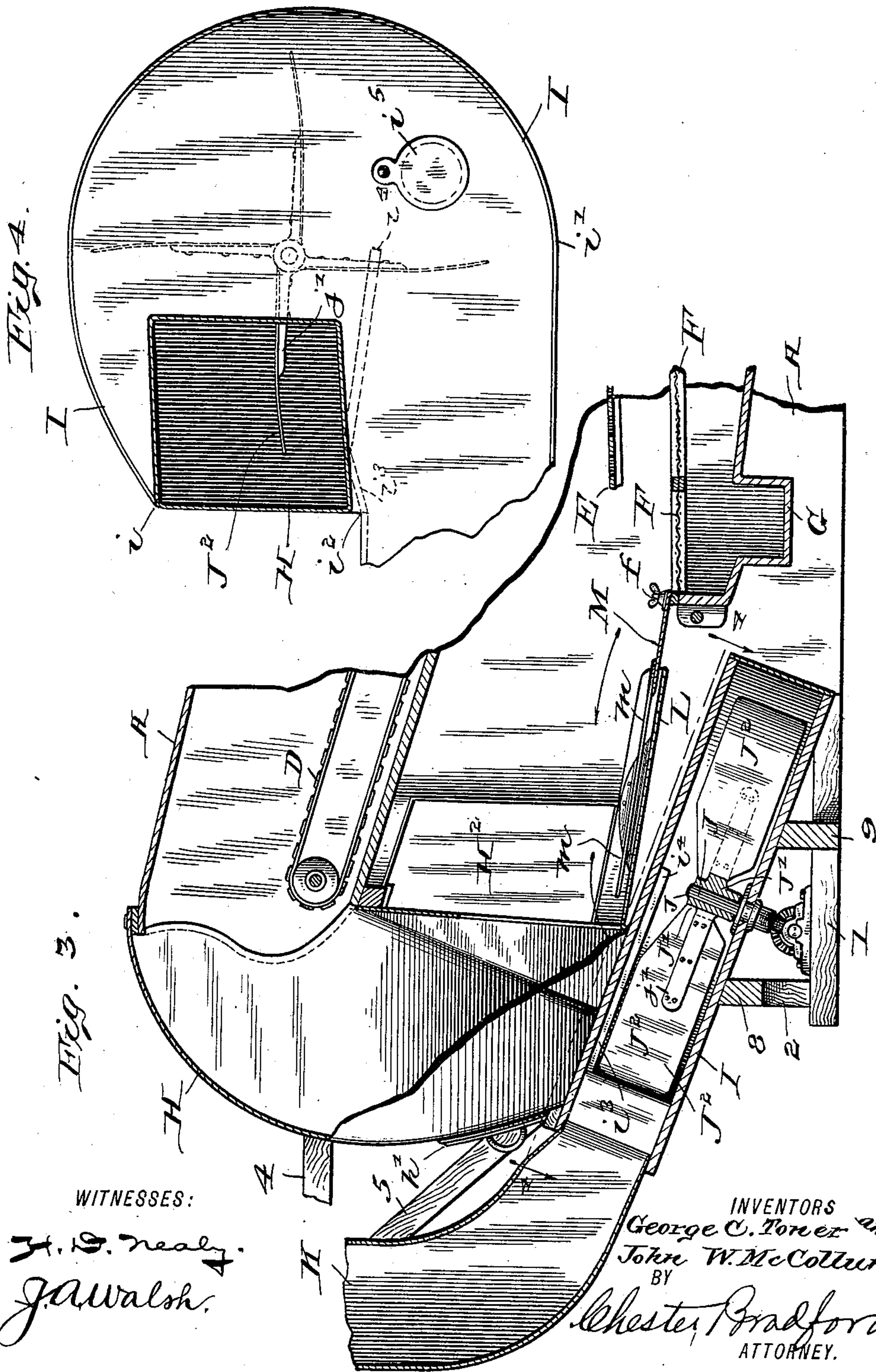
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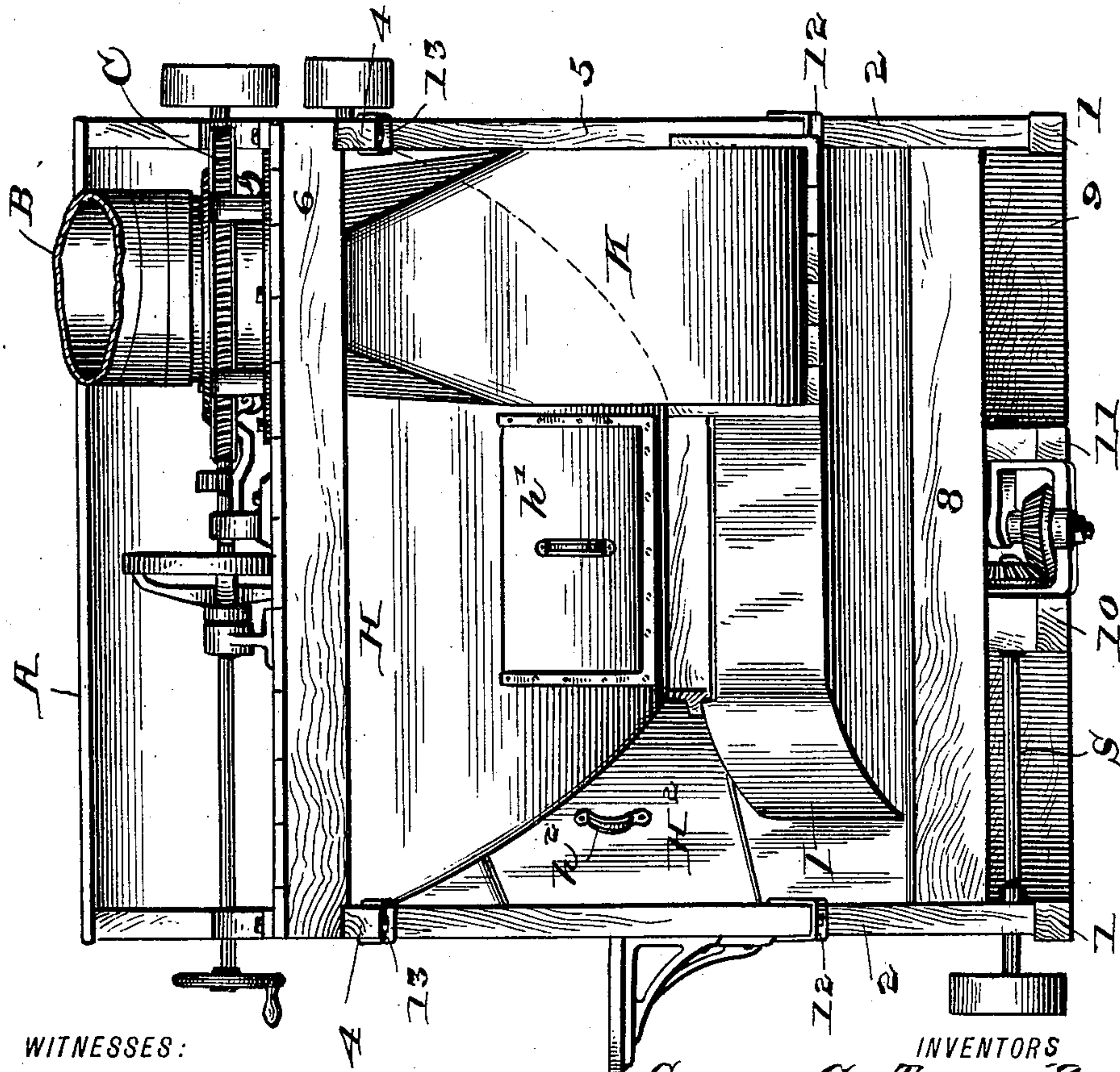
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Fig. 5.



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Fig. 6.

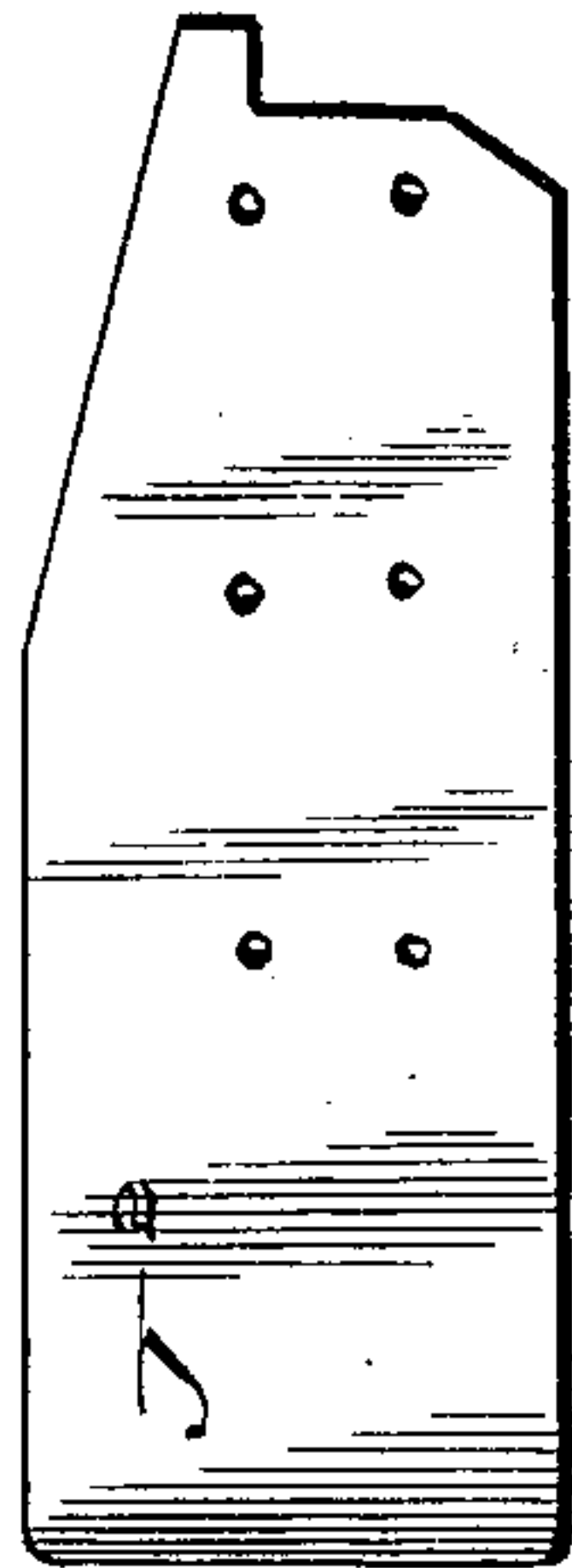


Fig. 7.



UNITED STATES PATENT OFFICE.

GEORGE C. TONER AND JOHN W. MCCOLLUM, OF WEST INDIANAPOLIS,
INDIANA, ASSIGNORS TO THE INDIANA MANUFACTURING COMPANY,
OF INDIANAPOLIS, INDIANA.

PNEUMATIC STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 592,673, dated October 26, 1897.

Application filed March 1, 1897. Serial No. 625,528. (No model.)

To all whom it may concern.

Be it known that we, GEORGE C. TONER and JOHN W. MCCOLLUM, citizens of the United States, residing at West Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Pneumatic Straw-Stackers, of which the following is a specification.

In that class of pneumatic straw-stackers wherein the fan or discharger itself receives the straw and in which the ingress-opening is in one side of the fan-casing only it has heretofore been regarded as necessary that such opening should be central or substantially central of the fan structure and that the hub and inner ends of the arms of the fan should be covered by a disk or plate and the straw and chaff thus prevented from coming in contact therewith, which contact when permitted is apt to result in entanglement of the straw with said moving parts, thus interfering seriously with the operation of the machine. A further disadvantage in such machines as have heretofore been constructed consists in the fact that the straw is projected against the fan at a central point, where obviously and necessarily the fan-blades are less efficient than at their extremities or outer portions.

It is the principal object of our invention to produce a pneumatic straw-stacker in which these various disadvantages shall be absent, and while it consists in a considerable number of new features, which will be hereinafter described and claimed, its principal or leading feature is a peculiar arrangement of the ingress-opening to the fan-casing whereby the straw is received into said casing at its outer portion instead of at its central portion.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters and figures of reference indicate similar parts, Figure 1 is a side elevation of the rear portion of a threshing-machine or separator and so much of a pneumatic straw-stacker attached thereto as embodies our present invention; Fig. 2, a horizontal sectional view thereof on the dotted lines 2 2 in Fig. 1; Fig. 3, a vertical longitudinal sectional view of the parts involved in our pres-

ent invention; Fig 4, a plan view of the fan or discharger separately; Fig. 5, a rear elevation of the machine, being a view from the left hand of Fig. 1; and Figs. 6 and 7 a detail elevation and detail plan, respectively, of one of the fan-blades.

In said drawings the portions marked A represent the rear end of a threshing-machine or separator, and B a fragment of the trunk or chute of the straw-stacker carried by the usual turn-table C. These parts are or may be in themselves of any usual or desired construction. Within the separator A is usually a raddle or straw-carrying belt D, a shaking-floor E, one or more sieves F, and the grain-receptacle G, as shown.

As shown most plainly in Fig. 1, we attach a supplemental frame to the frame of the separator, which supplemental frame consists of the longitudinal and vertical members 1, 2, 3, and 4, two braces 5, extending between the parts 2 and 4, and the transverse members 6, 7, 8, and 9. Upon the members 6 and 7 the turn-table carrying the trunk or chute of the pneumatic stacker is mounted. The members 1, 10 and 11 carry the bearings for the fan-shaft and its driving-shaft, and the transverse members 8 and 9 carry the fan-casing. Secured to the appropriate faces of the members 2 and 4 are metal sockets 12 and 13, into which the ends of the braces 5 enter and by which said braces are supported. The members 4 are secured to the members 3 by bolts 14, all as best shown in Fig. 1, and by removing these bolts the entire outer portion of the frame becomes loosened and, together with the turn-table and the spout running from the fan-casing thereto, may be removed without disturbing any of the remainder of the machine. This is of great advantage in the matter of assembling and disassembling the machine, greatly facilitating packing and transportation. All parts in rapid motion are thus provided with support from stationary braces of the frame, while the outer stationary or slowly-moving portions are carried by an easily-removable and lighter portion of the frame.

Attached to the rear end of the separator A and covering what would be otherwise the open rear end thereof is a hopper-like chute H, into which the straw and chaff enter from

the machine and by which it is conveyed into the fan-casing through the ingress-opening therein, the lower end of said chute H being fitted to said ingress-opening. Said chute H is preferably provided with hand-holes near the top having suitable covers h , whereby access can be had to the body of straw flowing into it from the separator, if desired, and it has also a sliding door h' on the rear side by which convenient access can be had to the fan-casing and through the ingress-opening therein to the fan, said ingress-opening being directly below the opening covered by the door h' . Ordinarily there would be open spaces between the rear of the separator and the adjacent portion of this chute H, and these we prefer to close by sheet-metal walls composed very largely by removable doors H^2 , having handles h^2 . By means of these doors access can be had to that space within the rear of the separator above and leading from the shaking floors and screens therein.

The fan-casing I is of peculiar form, as best shown in Fig. 4, where the form of its ingress-opening is also shown with the lower end of the chute H in section. That portion of the peripheral wall of said casing which in effect forms a continuation of the chute H is flat, and from the point i where this opening terminates around to the point i' said peripheral wall is curved, and from said point i' said wall is straight and continues on and forms the sides of the discharge-opening, the wall of the discharge-opening, which connects with the pipe K, leading from the fan-casing up to and through the turn-table to the base of the main tube or chute B of the stacker. Leading in from the point i^2 at the beginning of the wall forming the other side of the egress-opening is a short wall or plate i^3 , running back to a point close to the path of the extreme ends of the fan-blades and positioned on a radial line drawn from the axis of the fan to said point i^2 . This plate or wall located and arranged as stated is of great importance to the operation of our invention, its effect being to cause the air to flow properly out of the egress-opening and overcomes any tendency which it might have to pass on and thence out of the ingress-opening, which if permitted would of course render the machine non-effective. This result is aided by the rib i^4 , which runs from the point of termination of the wall or plate i^3 to a point substantially opposite the axis of the fan and preferably on a line inclined somewhat away from said axis, as shown by the dotted lines in Fig. 4. This rib, as shown in Fig. 3, extends down from the top of the fan-case I a short distance and to as close to the path of the fan-blades as is practicable. We regard it as largely due to this wall or plate i^3 and this rib i^4 that we are enabled to make the ingress-opening into the fan-casing at or near the periphery thereof instead of at or near the center, as has heretofore been supposed to be necessary in devices of this character. It sometimes hap-

pens that the supply of air to the fan is insufficient, because of the opening leading thereto being filled with straw or from other causes, and consequently the blast will be too weak to throw the straw to the point desired. When this condition arises, it becomes necessary to provide for an additional supply of air, and this we do by means of an opening in the fan-casing at a suitable point, which we provide with a cover i^5 , as best shown in Fig. 4. Normally this cover remains closed, as the supply of air entering through the opening which receives the straw is usually sufficient; but when insufficient this cover is opened and the deficiency of air-current is thus supplied.

The fan is composed of a fan-shaft J, driven by suitable gearing and having a hub J' with suitable arms thereon, and blades J^2 , secured to arms j' on said hub J' . These fan-blades are made of flexible springy sheet metal and project a considerable distance beyond the ends of the hub-arms j' and are curved backward somewhat, as shown most plainly in Figs. 4 and 7. Their flexibility permits them to yield somewhat whenever the condition of their work requires it, while the backward curve causes them to operate somewhat differently and, as we have found by experiment, somewhat more efficiently than if they were straight. This yielding of the ends of the fan-blades is rendered especially desirable by reason of the fact that owing to the position of the ingress-opening in the fan-casing the straw is caused to first come in contact with said ends. As the entrance of the straw is somewhat irregular and its condition variable, the yielding fan-blades accommodate themselves better to the work than rigid ones would do. The fan is driven from a suitable driving-shaft S and an appropriate gear, by which it is connected to the fan-shaft J, as best shown in Fig. 5.

The neck or chute K covers the egress-opening of the fan and leads thence up to and is supported by the frame below the turn-table and is suitably connected to the lower end of the main trunk or chute B of the straw-stacker. The form and arrangement of this tube or chute is of course dependent somewhat upon the form and arrangement of the other parts and may be curved more or less as the fan-casing occupies one position or another, being less curved where, as in the drawings, said fan-casing sets somewhat on an angle than where the fan-casing sets horizontally. Where the fan-casing sets vertically, of course the parts may be so arranged that no curve in this tube or chute at all is necessary.

As heretofore indicated, the main body of the straw comes from the threshing-machine over the raddle or straw-carrying belt D and falls through the hopper-like chute H into the fan-casing I. The chaff and finer waste particles come from the shaking floors and screens E F and are also drawn into the hopper-like chute H through the opening side thereof be-

low the raddle D. A receiving-floor L, properly secured within the machine above the rear portion of the fan-casing I, receives this finer material as it is discharged from the shaking floors and screens and other portions of the interior of the separator before it finally reaches the fan through the openings provided therefor. In order to keep this material in motion and prevent it from settling on this floor, a light frame, including agitating-fingers, is secured upon the extreme rear portion of the structure, which includes the shaking-screen F. This is composed of a plate M, which is secured to said last-named structure by suitable thumb-bolts *f*, which plate is of sufficient length to extend from said structure to over the nearest edge of the floor L, and thus prevents any of the fine material from falling down through what would otherwise be an intervening open space. Extending from the front edge of this plate are the agitating-fingers *m*, which extend nearly to the front edge of said floor L. The structure composed of the plate M and fingers *m* of course has the same motion as the structure to which it is attached and keeps the material thoroughly agitated, so that any piling up of material at this point is prevented. When desired, this device can be readily removed by removing the thumb bolts or nuts *f*, when it can be readily lifted off and taken out of the machine, and this is usually necessary when it is desired to change the shaking-screens.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of a threshing-machine, a hopper-like chute attached to the rear end thereof, a fan or discharger casing wherein the ingress-opening is in one side and next the peripheral wall thereof into which said hopper-like chute is arranged to discharge, a fan within said casing, and a discharge-pipe leading from the periphery of said casing and positioned to one side of the ingress-opening in the side thereof, substantially as shown and described.

2. The combination, in a pneumatic straw-stacker, of a fan or discharger casing wherein the discharge-chute is located wholly to one side of the center and beyond a line passing through the fan-shaft parallel therewith, and said discharge-chute extending out substantially tangentially to the peripheral wall

of said casing and having its inner side on a substantially radial line from said fan-shaft for a short distance and thence substantially parallel with the outer side thereof, substantially as shown and described.

3. The combination, in a pneumatic straw-stacker, with a discharge-pipe, and a fan, of a fan-casing having its ingress-opening in one side thereof next the peripheral wall, and provided with an interior wall or plate (as *i*³) leading from the point of juncture of the discharge-pipe inwardly toward the fan-shaft to a point close to the path of the ends of the fan-blades, substantially as shown and described.

4. The combination, in a pneumatic straw-stacker, of a fan-casing having its ingress-opening in one side and next the peripheral wall, a tangential discharge-opening, a radially-arranged wall or plate extending from the beginning of said discharge-opening toward the fan-shaft, and a rib on the under side of the top of the fan-casing extending back from the termination of said rib to a point substantially opposite the fan-shaft, substantially as shown and described.

5. In a fan or discharger for pneumatic straw-stackers, a fan-casing having the ingress-opening in one side thereof next the periphery through which the straw enters and through which the supply of air normally enters, and provided also with a second opening having a cover *i*⁵, whereby a supplemental supply of air is provided for when necessary, substantially as set forth.

6. The combination of a separator, a pneumatic straw-stacker, a hopper-like chute leading from the straw-discharging point of said separator to the ingress-opening of the discharger of the pneumatic stacker, a floor L positioned to receive the chaff and finer waste particles, and a structure composed of the plate M and fingers *m* carried by the frame of the shaking-screen structure, said several parts being arranged and operating substantially as shown and described.

In witness whereof we have hereunto set our hands and seals, at Indianapolis, Indiana, this 25th day of February, A. D. 1897.

GEORGE C. TONER. [L. S.]
JOHN W. MCCOLLUM. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.