

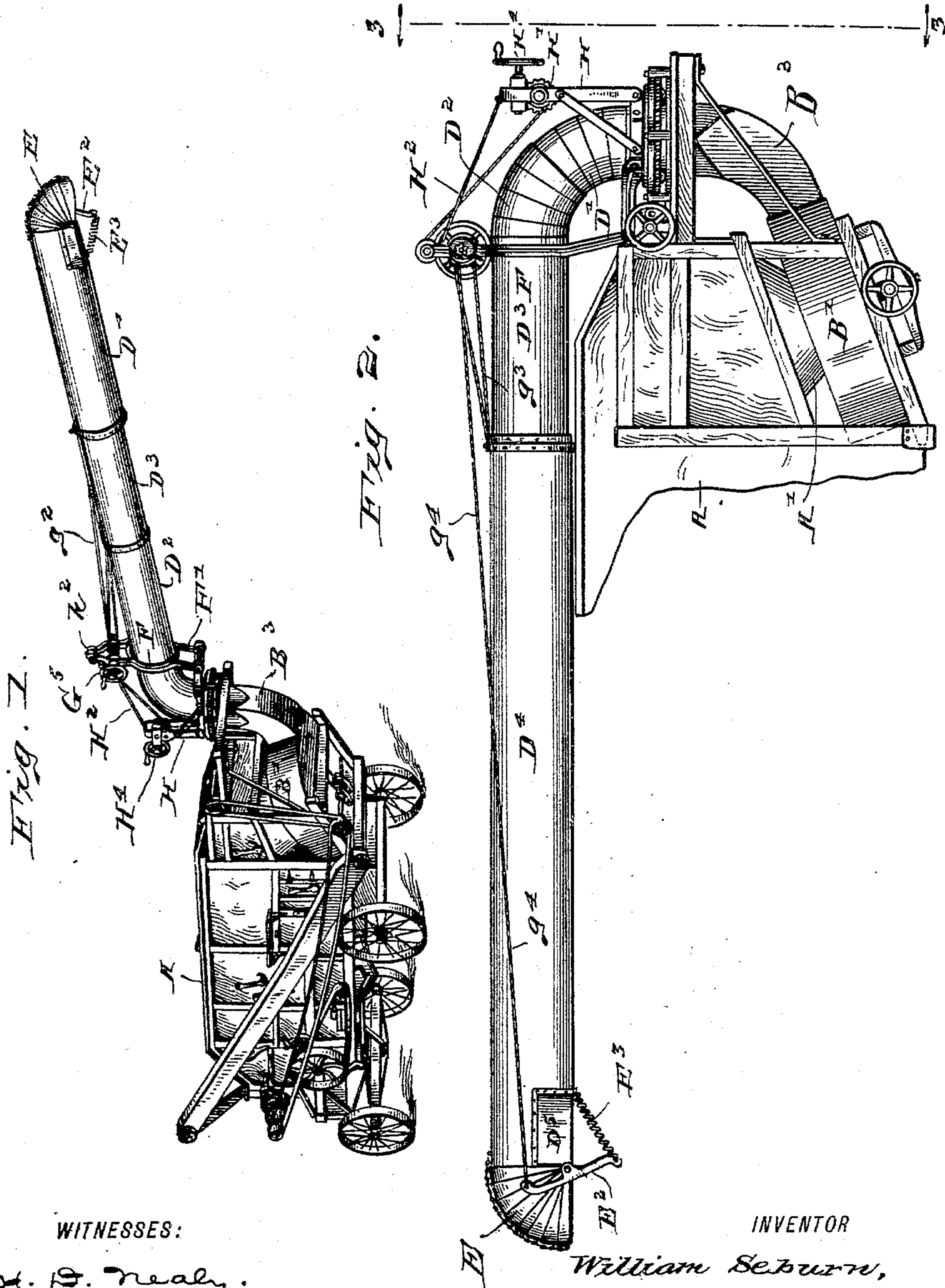
(No Model.)

5 Sheets—Sheet 1.

W. SEBURN.
PNEUMATIC STRAW STACKER.

No. 596,914.

Patented Jan. 4, 1898.



WITNESSES:

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

INVENTOR

William Seburn,

BY

Chester Bradford,
ATTORNEY.

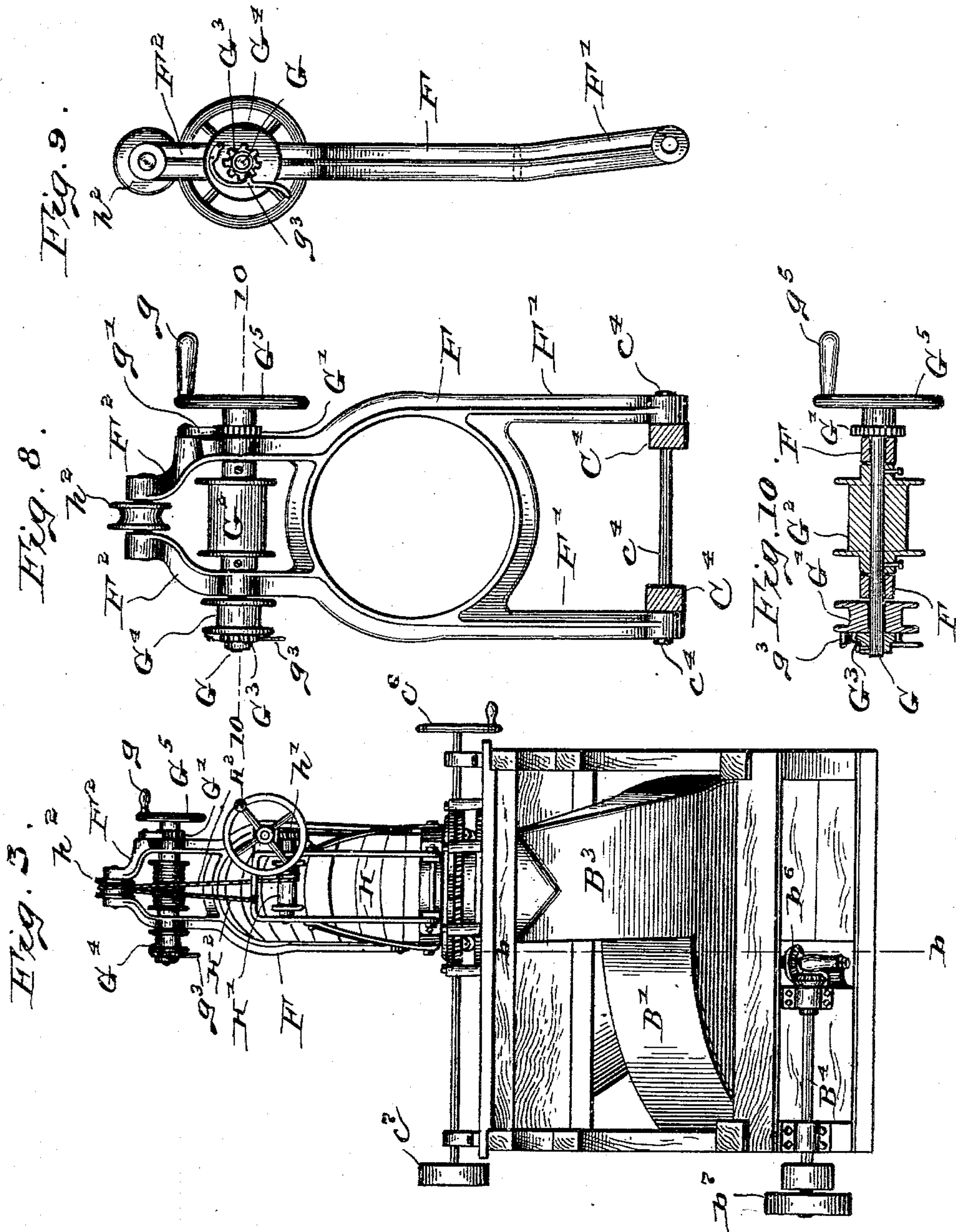
(No Model.)

5 Sheets—Sheet 2.

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5 Sheets—Sheet 3.

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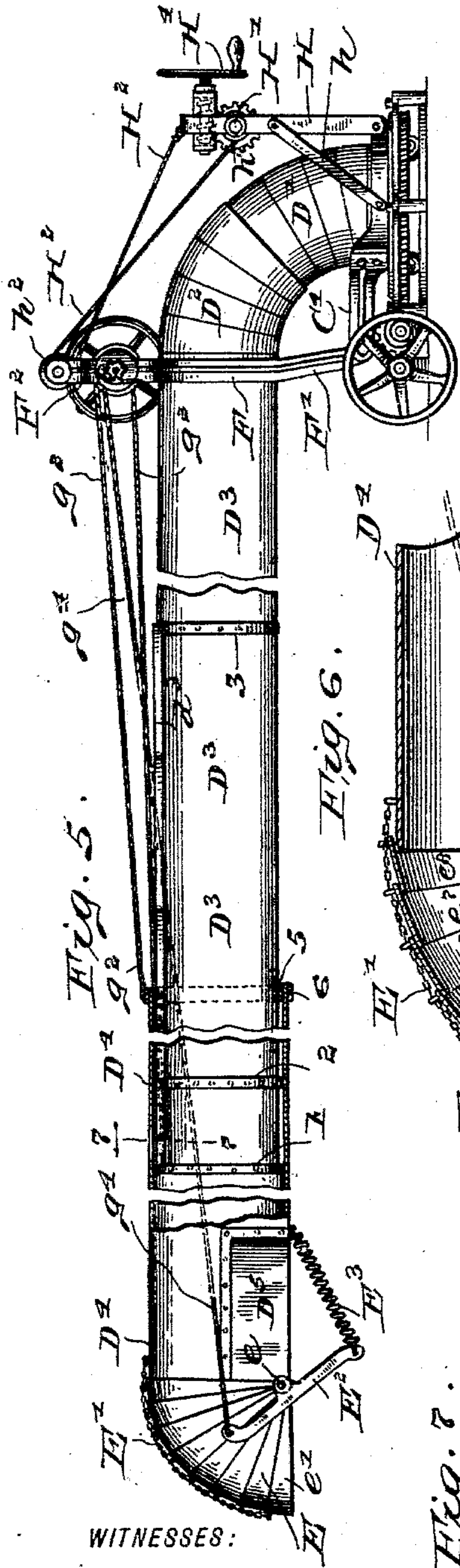


Fig. 5.

Fig. 6.

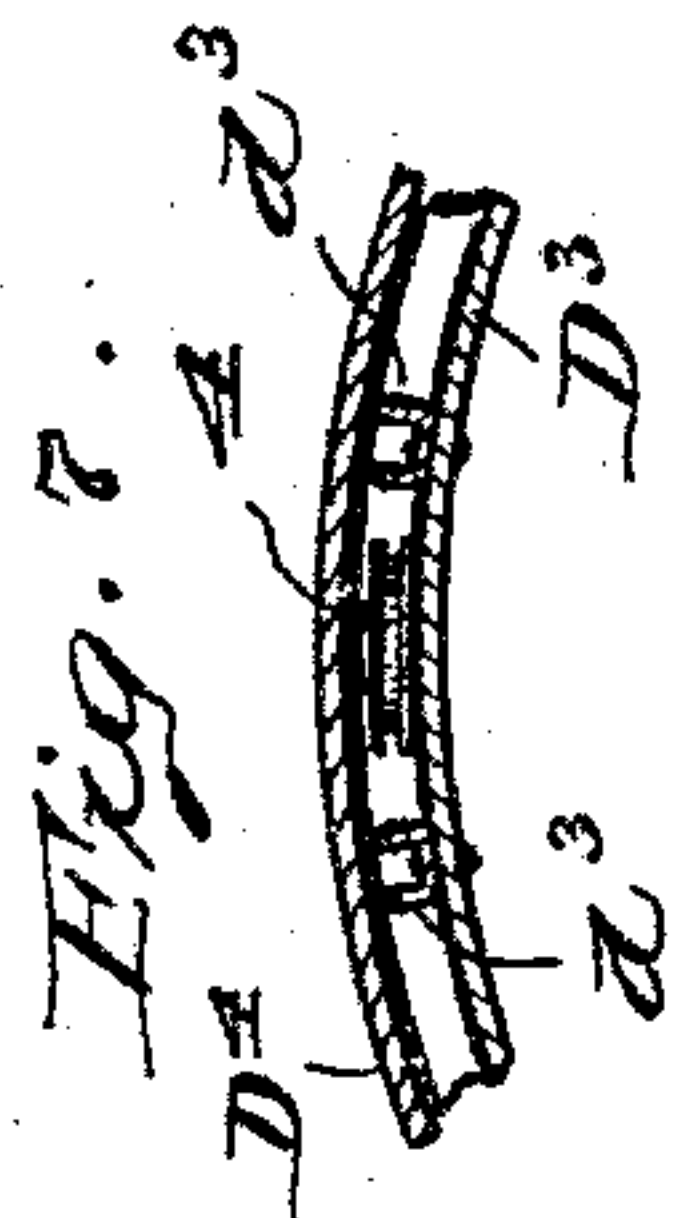
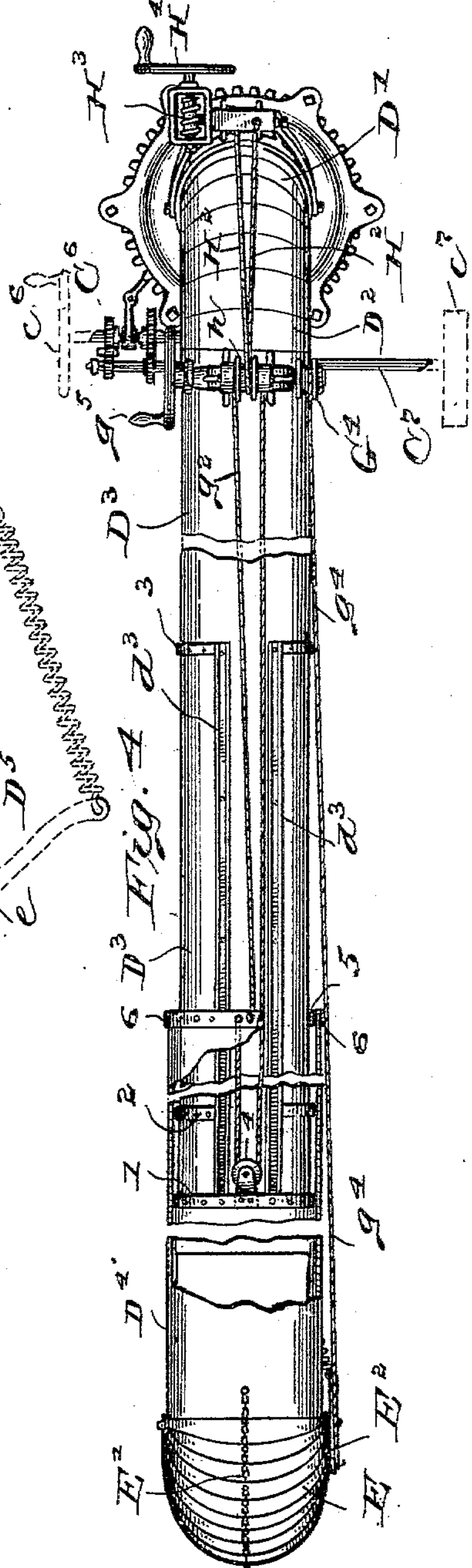


Fig. 7.



(No Model.)

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Fig. 12.

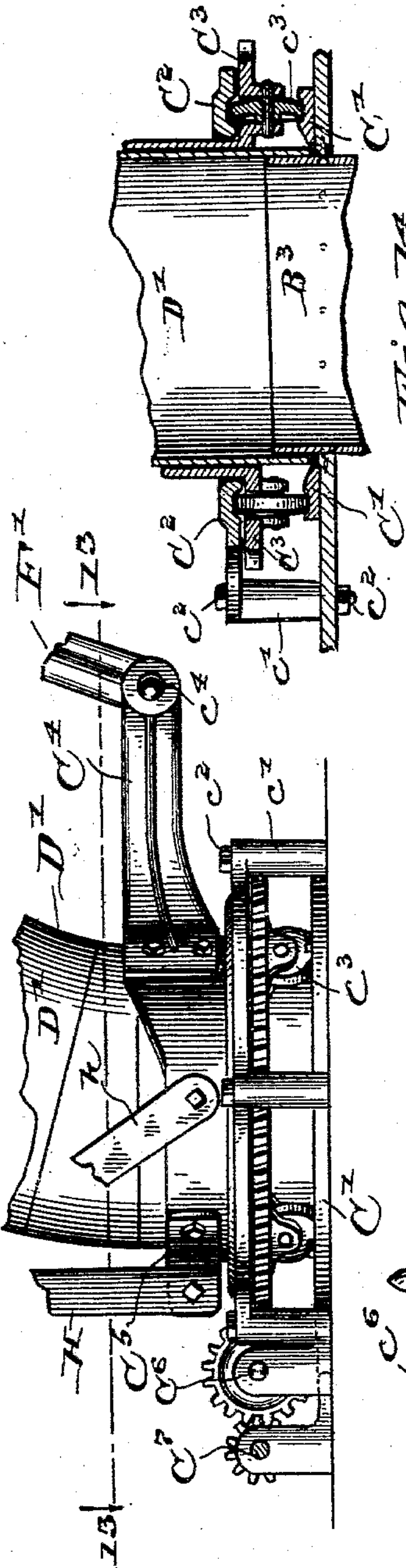


Fig. 14.

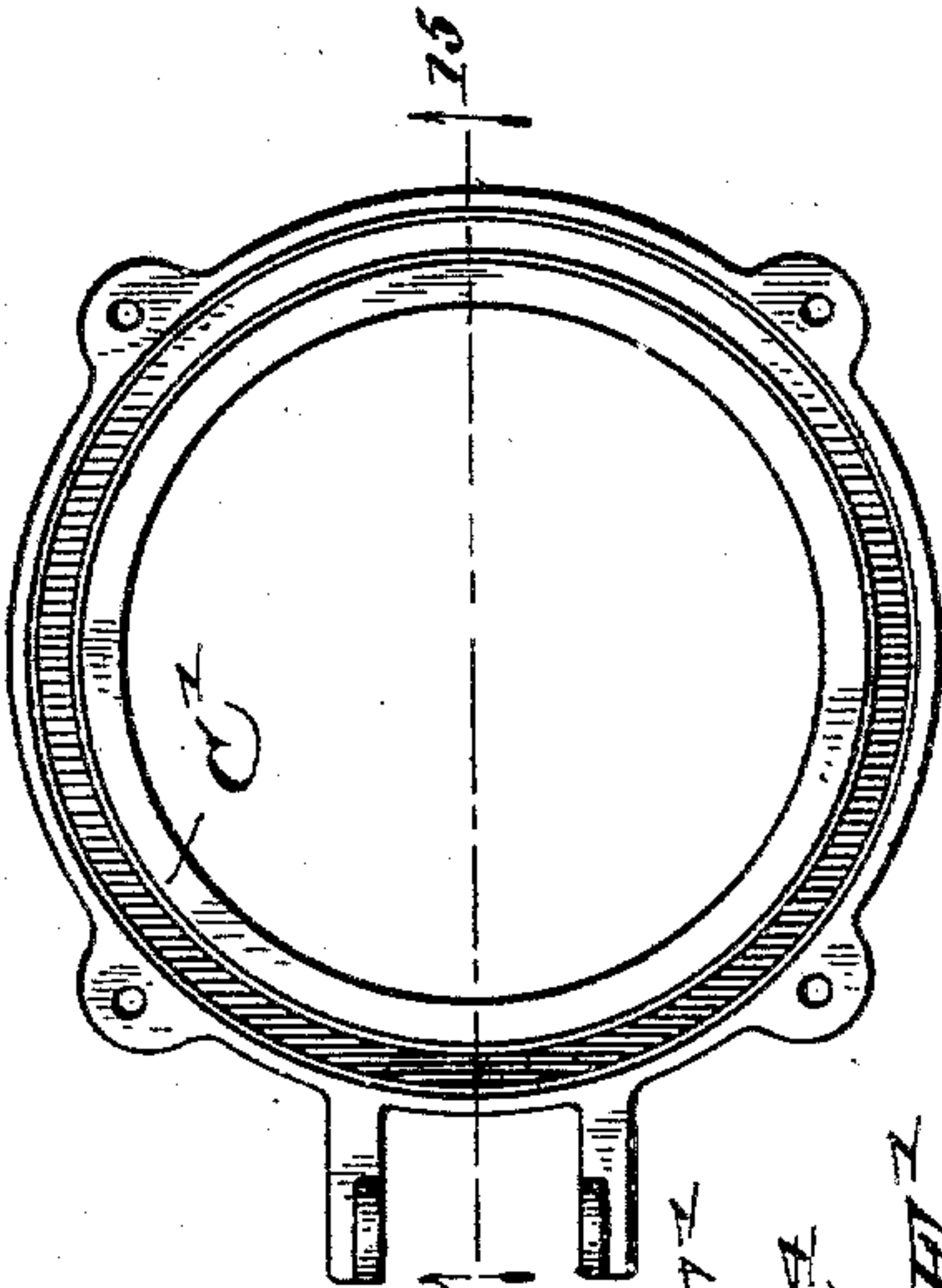


Fig. 15.

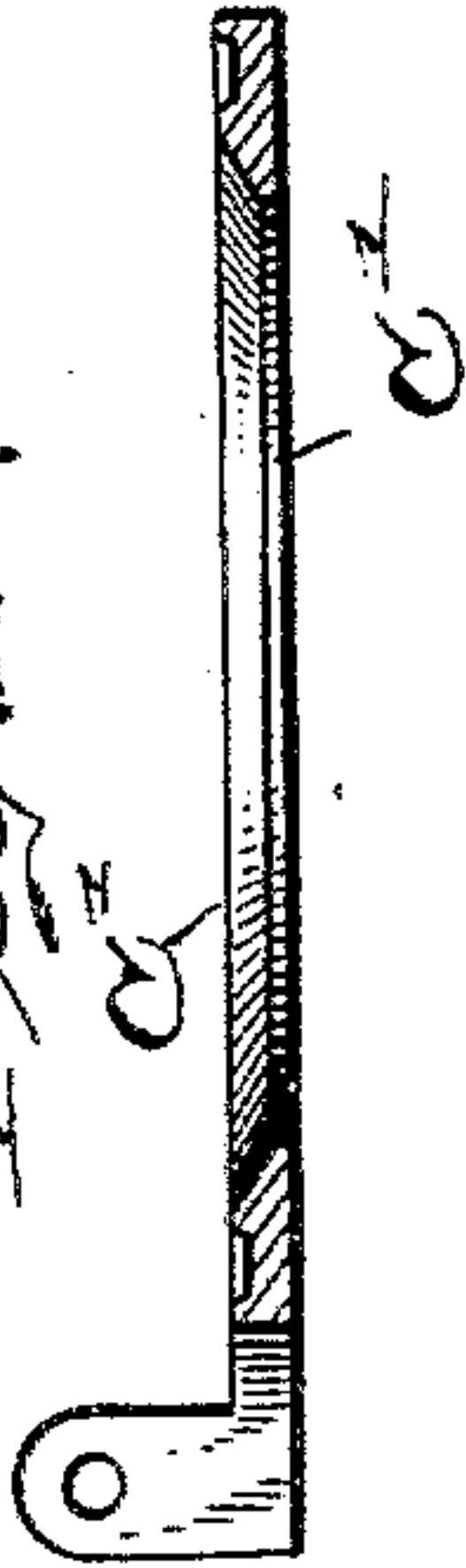


Fig. 11.

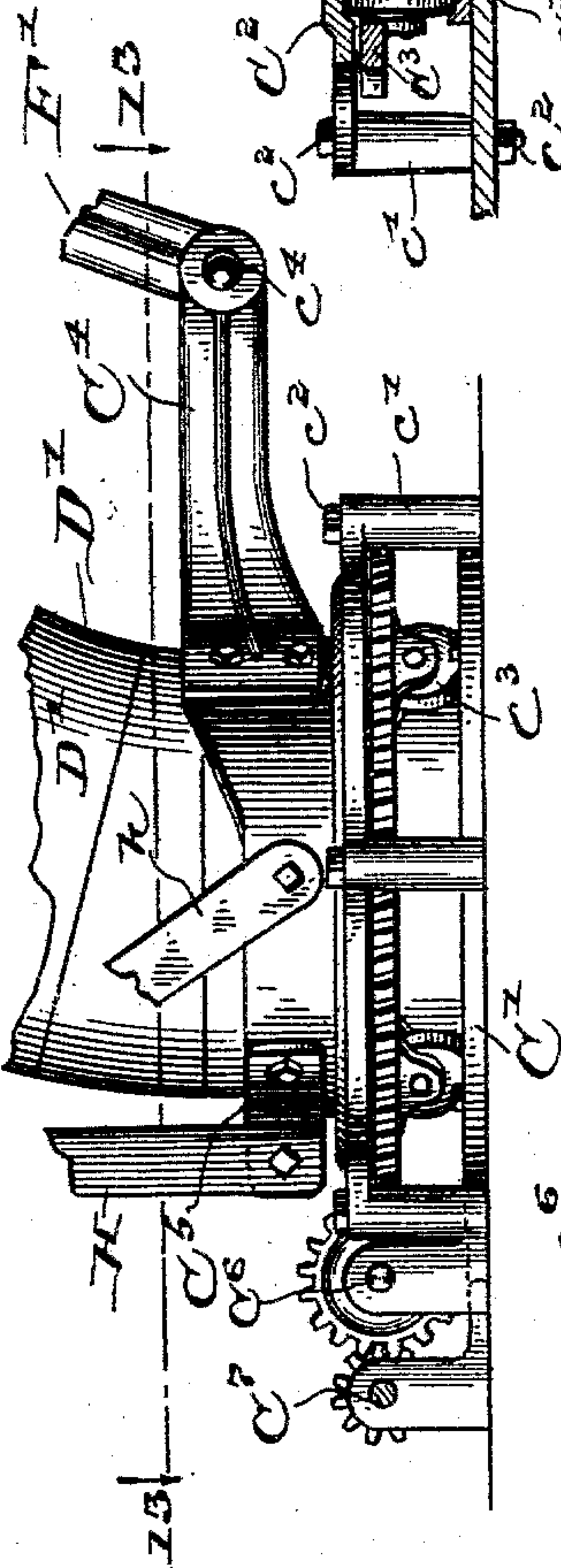
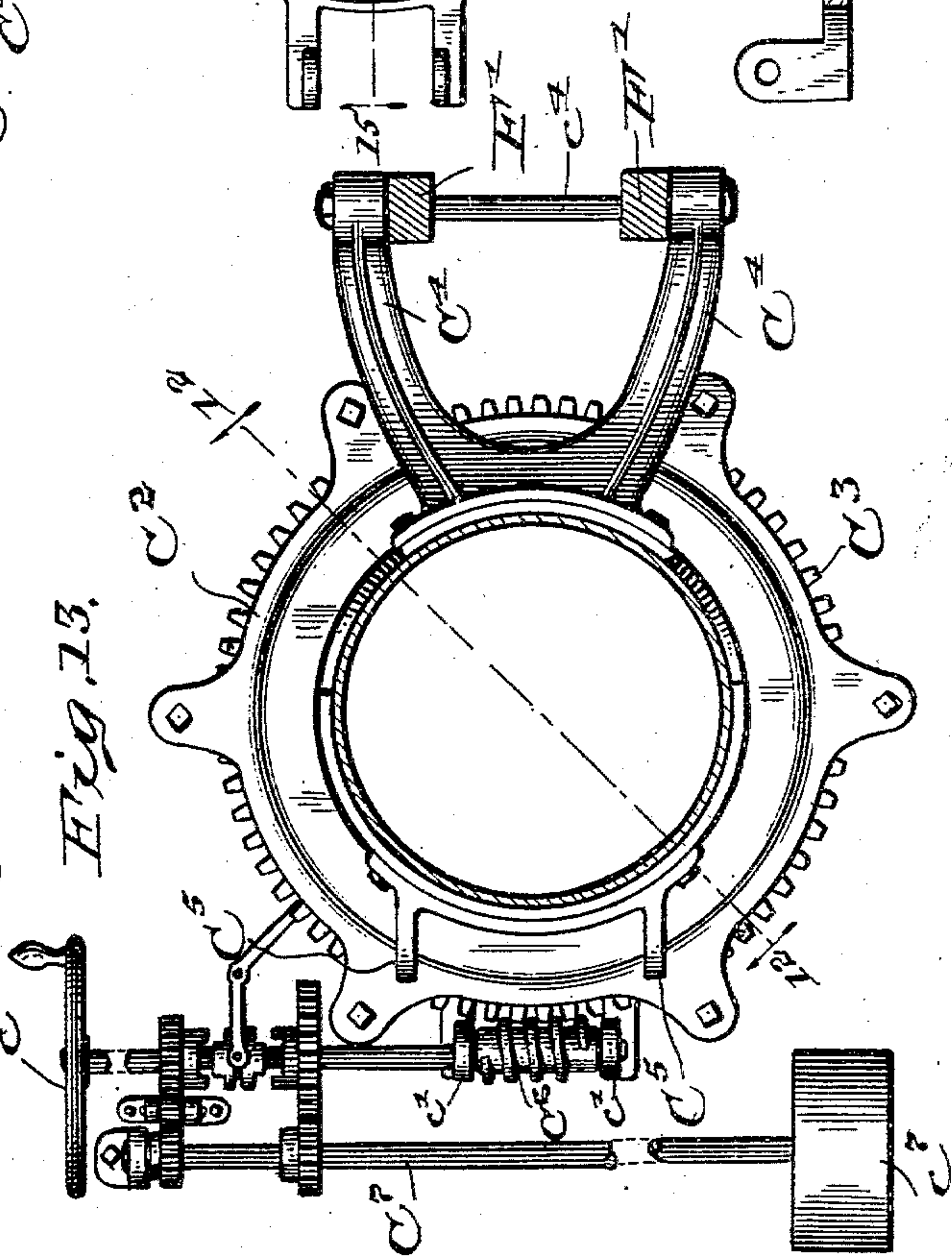


Fig. 13.



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Fig. 18.

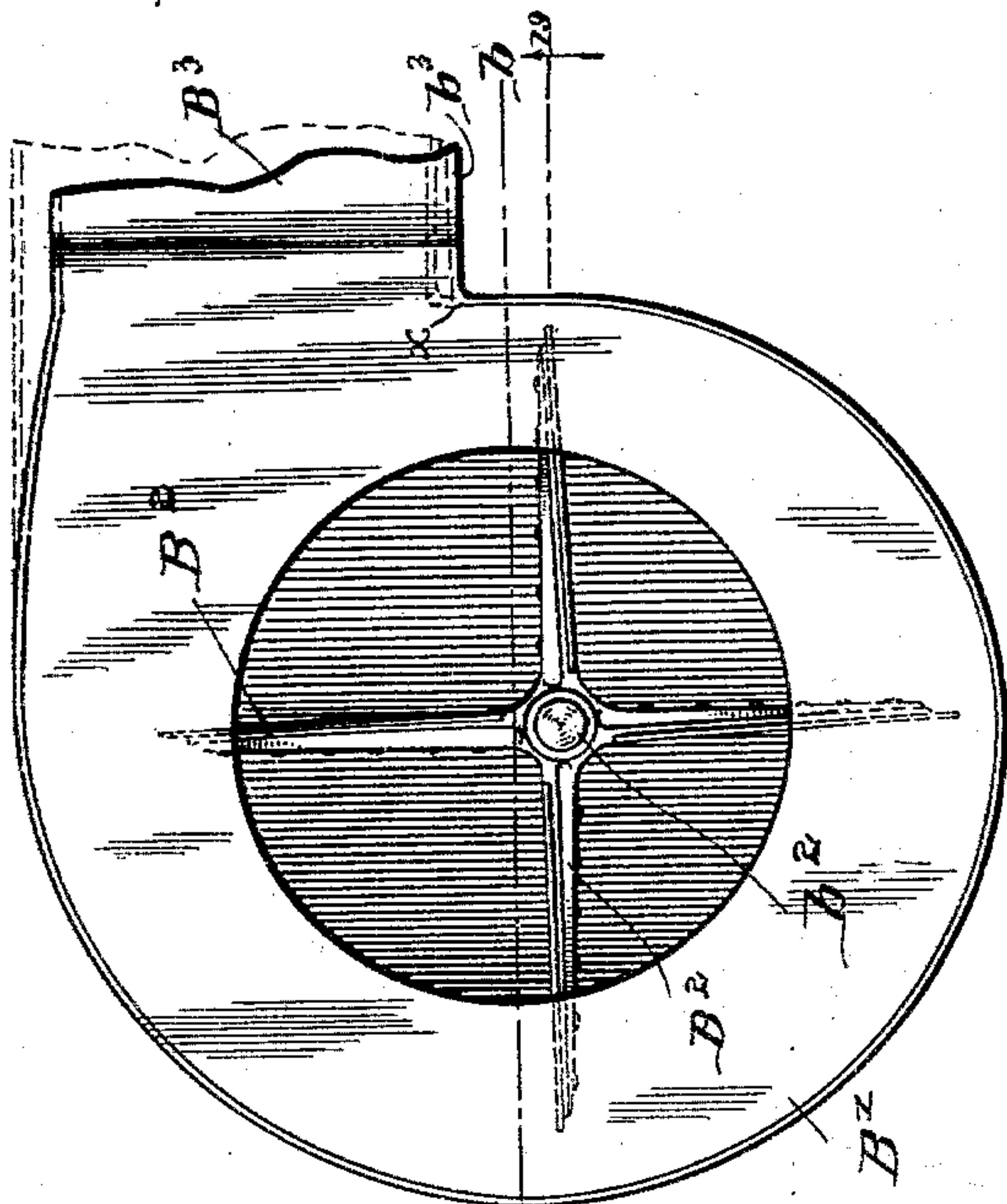
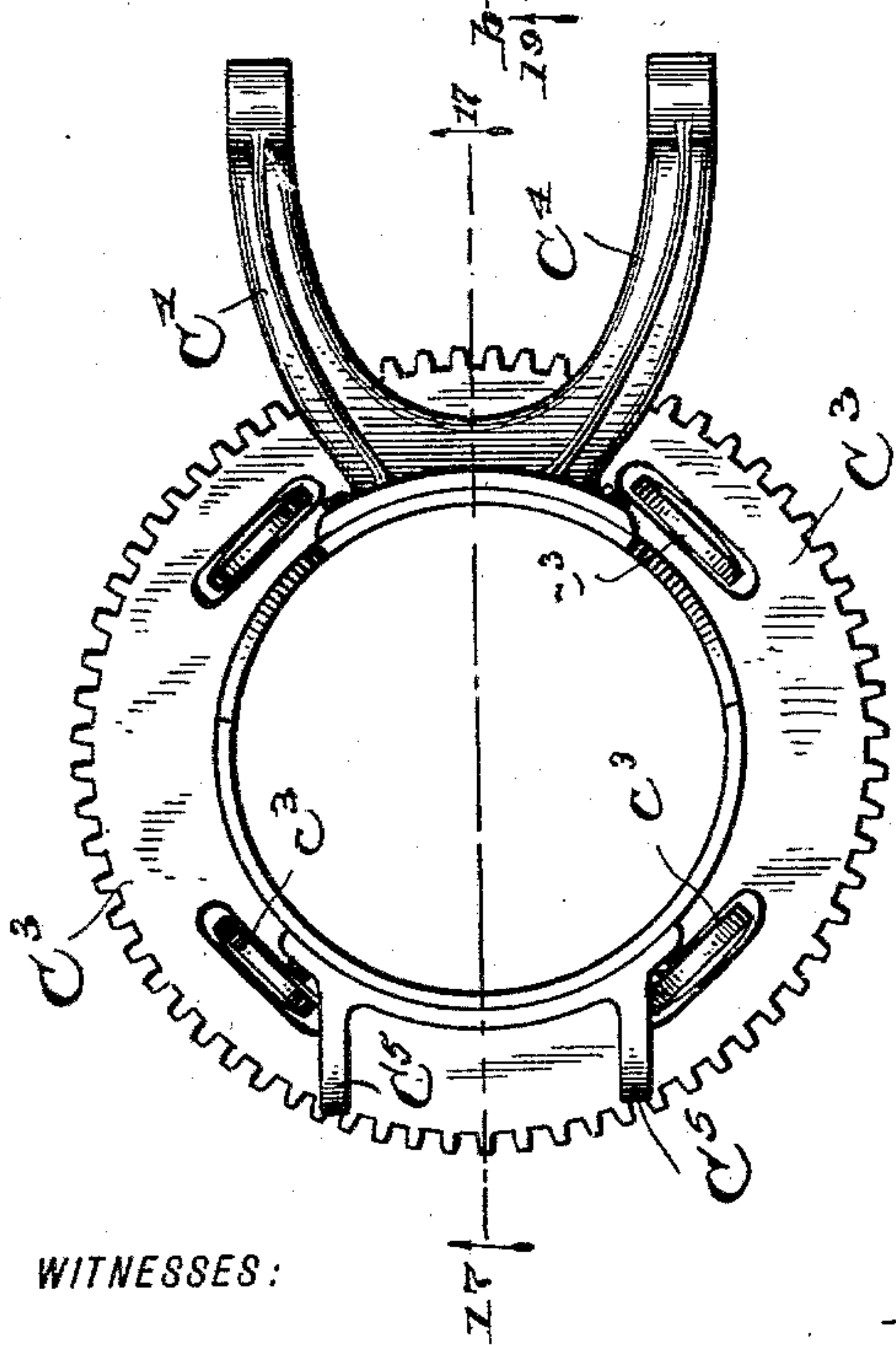


Fig. 16.



WITNESSES:

H. S. Neely,
J. A. Walsh,

Fig. 19.

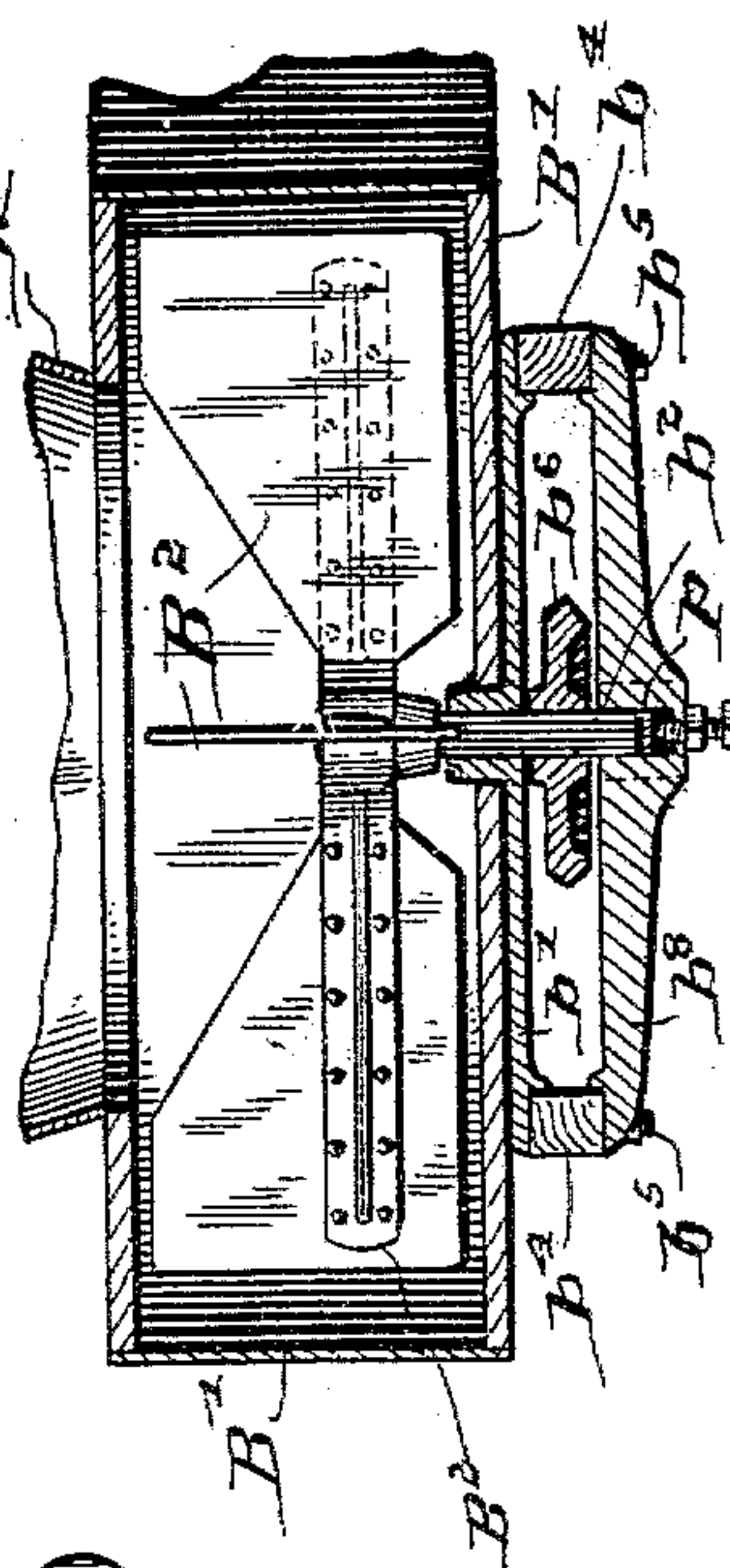
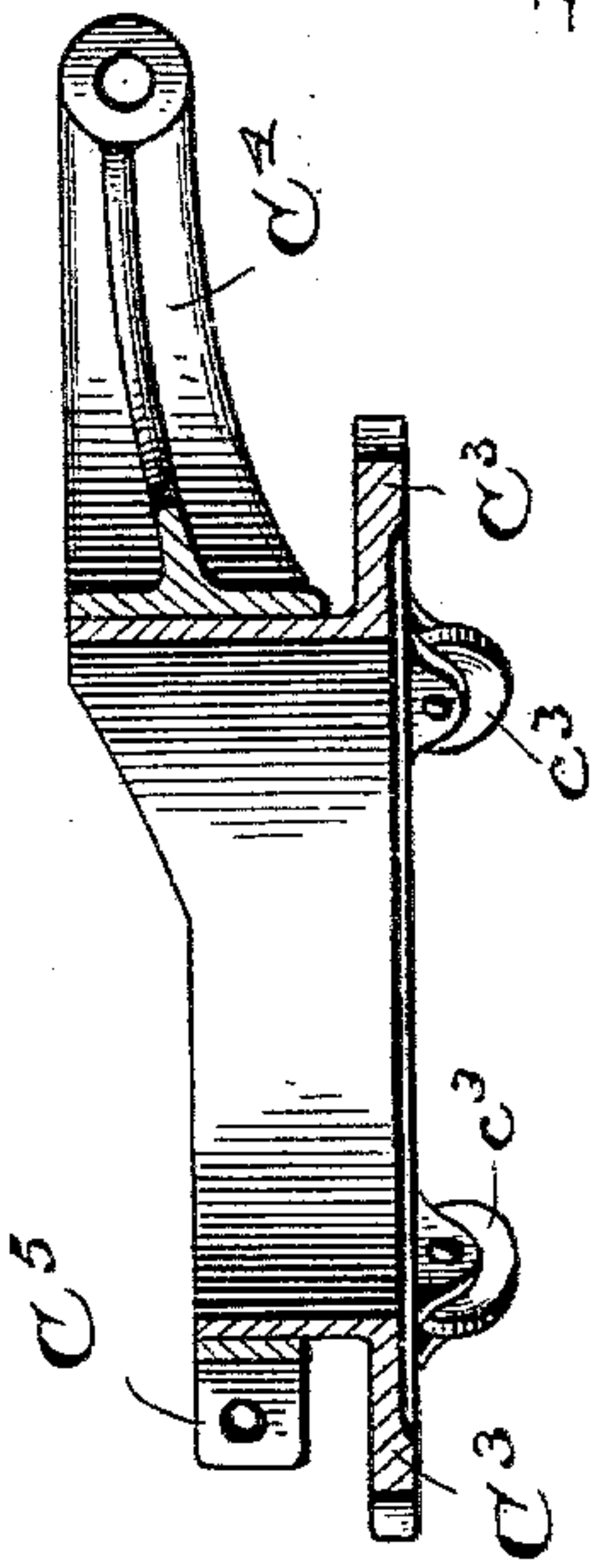


Fig. 17.



INVENTOR

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UNITED STATES PATENT OFFICE.

WILLIAM SEBURN, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE INDIANA MANUFACTURING COMPANY, OF SAME PLACE.

PNEUMATIC STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 596,914, dated January 4, 1898.

Application filed March 1, 1897. Serial No. 625,468. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SEBURN, a citizen of the United States, residing at 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.

My invention relates to that class of apparatus used for the purpose of conveying straw, chaff, &c., from threshing-machines and separators and discharging the same into a mow or upon a stack, and which are usually known as "pneumatic straw-stackers," of which the machine illustrated in the patent to James Buchanan, No. 467,476, dated January 19, 1892, is a leading example. Said invention consists in the improvement of such machines generally, and extends to numerous particulars, as will be hereinafter first fully described, and then particularly pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters and numerals of reference indicate similar parts, Figure 1 is a perspective view of a threshing-machine provided with a pneumatic straw-stacker in its extended or operative position, which stacker embodies my present invention; Fig. 2, a view, on an enlarged scale, of the extreme rear end of the threshing-machine or separator, with the pneumatic straw-stacker attached thereto turned to its idle or folded-up position, in which position it lies upon the top of the separator; Fig. 3, a rear elevation of the features shown in Fig. 2 as seen from the dotted line 3 3 at the right hand of said figure; Fig. 4, a top or plan view, on a still further enlarged scale, of those portions of the pneumatic straw-stacker from and including the turn-table thereof to the end of the discharging trunk or chute, some portions being broken away for the purpose of better illustrating various features of construction; Fig. 5, a side elevation of substantially the parts shown in Fig. 4; Fig. 6, a fragmentary sectional view, on a still further enlarged scale, of the outer end of the delivery trunk or chute, including the adjustable hood attached thereto; Fig. 7, a detail sectional view on the dotted line 7 7 in Fig. 5 on a still further enlarged scale; Fig. 8, a front view of

the yoke or frame by which the vertically-adjustable portion of the trunk or chute is carried; Fig. 9, an edge view thereof; Fig. 10, a detail sectional view on the dotted line 10 10 in Fig. 8; Fig. 11, a fragmentary side elevation of the turn-table and immediately adjacent parts, the shown relation of the parts being that which they occupy when the straw-stacker is extended, as shown in Fig. 1, instead of that occupied when the stacker is folded or idle, as shown in Figs. 2 to 5, inclusive; Fig. 12, a detail sectional view on the dotted line 12 12 in Fig. 13; Fig. 13, a horizontal sectional view on the dotted line 13 13 in Fig. 11; Fig. 14, a top or plan view of the lower plate of the turn-table; Fig. 15, a sectional view of the same on the dotted line 15 15 in said Fig. 14; Fig. 16, a plan view of the gear-wheel or central member of the turn-table and parts connected therewith; Fig. 17, a central sectional view thereof on the dotted line 17 17 in Fig. 16; Fig. 18, a top or plan view of the fan or discharger separately and Fig. 19, a central sectional view of the fan-casing on the dotted line 18 18, the fan itself being shown in elevation.

In said drawings the portions marked letter A represent the threshing-machine or separator; B' B², &c., the fan or discharger; C' C², &c., the turn-table; D' D², &c., the trunk or chute; E E', &c., the mouth or hood thereof; F F', &c., the yoke carrying the vertically-adjustable portions of the trunk or chute; G G', &c., the winder carried by said yoke, by which the length of the chute and the position of the adjustable hood are controlled, and H H', &c., the derrick by which the position of the trunk or chute as a whole is controlled.

The threshing-machine or separator A is or may be in itself of any usual or desired construction, and the parts thereof illustrated are simply for the purpose of giving a general view of the use, arrangement, and operation of the invention.

The fan or discharger is mounted on suitable framework at the rear of this threshing-machine or separator, and is composed of the fan-casing B' and the fan B², the latter mounted on the shaft b² and composed of a spider and blades, as usual. The eye of the fan is substantially central of one side of its struc-

ture and is connected by means of a hopper-like structure A' with the rear end of the separator. This fan is shown as occupying an inclined position in relation to the separator; but it may, if desired, be arranged in any other convenient position, and, as a matter of fact, such fan structures are frequently arranged in a horizontal position and also sometimes in a vertical position. The egress-opening develops into a curved neck B³, which leads up into the turn-table and forms a joint with the stump of the trunk or chute of the straw-stacker, as best shown in Fig. 12. As will be best observed by an inspection of Fig. 18, the parts are peculiarly arranged. The dotted line *b* indicates the center of the fan structure, which, as it will be observed, is half-way between a line drawn through the axis of the fan-shaft and the adjacent side or wall *b*³ of the neck B³, which forms the egress-opening—that is to say, in the construction shown the fan-casing being usually from forty to fifty inches in diameter, the fan-shaft is set about two inches to one side of a line drawn through its center, while the nearest edge of the neck forming the egress-opening is about two inches to the other side of the center. The opposite side of the egress-opening is shown as drawn in somewhat from a line parallel with the center line *b*, or, in other words, slightly away from a line tangential to the peripheral wall of the fan-casing, and I regard this as somewhat the best arrangement; but this outer wall may be on such tangential line, as indicated by the dotted lines on Fig. 18, in which case the inner wall *b*³ of said egress-opening would be positioned somewhat farther away from said center line *b*, so as to maintain the proper size of said egress-opening.

As will be observed, the peripheral wall of the fan-casing is so formed as that there is a somewhat constantly-increasing distance between the ends of the fan-blades as they pass from what is usually known as the "cut-off point" *x* around to the egress-opening of the fan, this resulting principally by reason of the position of the fan-shaft, but also somewhat from the formation of the fan-casing. As will be readily understood, with the arrangement of the eye or ingress-opening in the fan-casing and of the fan shown in Fig. 18 the most of the straw enters the fan-casing at that side nearest the egress-opening, and is thus almost instantly discharged therefrom. This arrangement greatly reduces the action of the fan-blades on the straw, so that it comes from the machine in a much less broken-up condition than where, as heretofore, most of it has been caused to travel around inside the fan-casing substantially an entire revolution. The power required is also obviously less. To secure the greatest efficiency the path of the fan-blades should be as near as possible to the peripheral wall of the fan-casing at the cut-off point *x*, which is at the beginning of the neck forming the

discharge-opening. The fan-shaft *b*² I prefer to mount in two bearings secured to the bottom of the fan-casing B', as best shown in Fig. 19, said bearings being preferably in the form of metal bars *b*¹ *b*⁸, between which are wooden cross-bars *b*⁴, and the whole being secured together by bolts *b*⁵. The lower bearing is in the form of what is known as a "step-bearing" with a hard-metal bearing-plate *p*, against which the end of the shaft rests, and which takes the thrust of said shaft, with an adjusting-screw, by which its position may be adjusted, all as clearly shown in Fig. 19. Mounted upon the shaft *b*² is a bevel gear-wheel *b*⁶, which, as shown in Fig. 3, engages with a corresponding bevel gear-wheel on the shaft B⁴, on the outer end of which shaft is a pulley *b*⁷, to which a belt runs from some suitable shaft on the threshing-machine. Of course I do not confine myself to a toothed gear for this purpose.

The turn-table, as shown in Figs. 11 to 17, inclusive, is made up of three parts C', C², and C³, the parts C' and C² being fixedly secured upon the framework, the part C² by means of studs *c*¹ and bolts *c*², and the part C³ being movably mounted between said parts C' and C². The parts C' and C² are provided with grooves in their opposing faces, which serve as tracks in which the carrier-trucks *c*³ of the movable part C³ run, as best shown in Fig. 12. The part C³, as best shown in Fig. 16, is, generally speaking, a gear-ring, is provided with means whereby the stump of the trunk or chute of the straw-stacker may be firmly attached thereto, and is also provided with trucks *c*³, which are adapted to travel in the tracks formed in the faces of the parts C' and C². As best shown in Figs. 11, 12, and 17, this gear-ring C³ has on its inner edge an upwardly-projecting flange adapted to surround the stump D' of the trunk or chute, said flange being at substantially right angles with the body of said ring. Firmly secured to said flange are two pairs of projecting arms C⁴ and C⁵, upon the former of which the yoke F is pivoted and by the latter of which the derrick H is carried. By this means this member C³ of the turn-table is adapted to conveniently carry the entire upper structure of the straw-stacker, including the derrick and operating mechanism, at the proper points, and thus said parts are maintained in the same general relation irrespective of the position to which the trunk or chute has been adjusted. The trucks *c*³ are saucer-shaped in form, as best shown in Figs. 12 and 16. The portions thereof which come in contact with the tracks are thus curved upon the outer sides, so that they are more easily guided in their movements about the tracks. The movable member C³ of the turn-table is preferably operated by a worm-gear C⁶, suitably mounted in ears *c*⁷ on the lower member C' or upon the top of the separator alongside the turn-table. I have shown a counter-shaft C⁷ with sets of spur-gears and an appropriate clutch, form-

ing a mechanism for automatically causing the trunk or chute to travel back and forth; but as this mechanism is not a part of my present invention it will not be further described. Said mechanism is driven by a belt (not shown) running to a pulley c^7 on this counter-shaft C^7 . When the automatic mechanism is disengaged, the position of the trunk or chute may be shifted by means of a hand wheel or crank c^6 on the end of the shaft carrying the worm C^6 .

The trunk or chute is composed of the curved "stump" D^1 , which is fixedly secured to the flange on the member C^3 of the turn-table, a similarly-curved section D^2 , adapted to move over said curved stump in the raising or lowering of the trunk or chute, and two telescoping straight sections D^3 and D^4 , the latter of which surrounds and extends out beyond the former. The section D^3 has two ribs d^3 on its upper side, which ribs are preferably formed of channel-iron, and between which is a clear space for the passage of an operating cord or rope, while the ribs themselves form rests upon which the outer section D^4 may slide. Upon the extreme end of the section D^3 is a ring or collar 1, which completely surrounds the same. A short distance to the rear thereof, varying preferably from one to two feet, is another ring or collar 2, which surrounds said section, excepting as to the space between the ribs d^3 , and at the extreme rear end of said ribs d^3 there is another ring or collar 3 similar to the ring or collar 2. In the extreme forward end of the space between the ribs d^3 close to the ring or collar 1 is secured a sheave or pulley 4, which, while preferably revoluble, may be fixed, as best shown in Figs. 4 and 7, the purpose of which will presently be explained.

The section D^4 is somewhat larger than and surrounds the section D^3 . At its extreme rear end it has an interior band or collar 5, which extends around the same, except as to the space between the ribs d^3 on the section D^3 , and it also preferably has an exterior band or collar 6 partly or wholly surrounding it at the same point. The section D^4 moves telescopically upon the section D^3 ; but this operation will be particularly described in connection with the operating mechanism. At the forward end, as best shown in Fig. 6, this section D^4 has an open under side formed by cutting away a portion of the cylinder structure forming said section D^4 and securing in place thereof the straight sides D^5 , and the opening so made forms the greater part of the egress-opening for the straw, from which it falls to the stack or mow.

The hood E is composed of numerous sections $e^1 e^2$, &c., all mounted upon the pivots e , which are carried by the extreme lower and forward corners of the side plates D^5 . These sections are connected together by a chain E' , one end of which is connected suitably to the upper side of the trunk or chute section D^4 . An arm E^2 is rigidly connected to the lower

hood-section e^1 , and when rocked operates to raise said hood-section, which in turn operates the other sections, thus giving said hood as a whole a position by which it is enabled to deflect the straw issuing from the trunk or chute to a greater or less extent. Normally this arm is held to that position which holds the hood to its extreme extended position by means of a torsional spring E^3 ; but it is adapted to be pulled back to any extent desired by the cord or rope g^4 , running back to the operating mechanism, as will be presently described. The chain E' holds the parts in their proper relative position at all times and prevents any of the sections from dropping out of proper relation to the adjacent sections.

The yoke F , as shown most plainly in Fig. 8, has a central opening, which surrounds the part D^2 of the trunk or chute and serves, through the mechanism which will be presently described, to support or carry the movable portion of said trunk or chute as a whole. Its legs F' are pivoted on the pivot-shaft c^4 , carried by the arms C^4 on the turn-table. An extension F^2 , projecting upwardly from the upper side of the ring surrounding the trunk or chute, carries the shaft G of the winding mechanism and also the shaft of a sheave h^2 , around which the rope from the hoisting-derrick passes.

The shaft G is mounted in the upwardly-projecting extension F^2 of the yoke F and carries rigidly attached thereto the circular rack or detent G^1 , the winding drum or spool G^2 , and the circular rack or detent G^3 and also carries loosely mounted thereon the winding drum or spool G^4 . It further has a hand-wheel G^5 , having a handle g^5 , by which said shaft and the parts carried thereby are turned. The loosely-mounted spool G^4 carries a spring-pawl g^3 , which engages with the circular rack or detent G^3 . The details just described are best shown in Figs. 8, 9, and 10. As most plainly shown in Figs. 4 and 5, a rope g^2 is wound about the spool G^2 , and the ends of said rope run forward and are connected to the section D^4 of the trunk or chute at its extreme rear end, where it bears the band or collar 5, one end of which rope, however, first passes under said band or collar to the sheave 4, secured to the front end of the trunk or chute section D^3 . By this means by revolving the shaft in one or the other directions the outer section D^4 of the trunk or chute can be adjusted to project more or less and the length of the trunk or chute as a whole thus determined, as may be desired. The ribs d^3 and the band or collar 1 form a space within which the rope g^2 may pass to inside the chute-section D^4 , where it passes around the sheave 4 or its equivalent. By this means I am enabled in a telescopic trunk or chute to dispense with all exterior tracks or supports, thus greatly simplifying, as well as improving, this feature in a pneumatic straw-stacker. The position to which the movable section

D⁴ of the chute is projected, especially when said chute stands at a considerable elevation, is maintained by the pawl g' , carried by the frame F², which engages with the circular rack or detent G' on the shaft G.

A single rope g^4 runs from the loosely-mounted winding drum or spool G⁴ to the upper end of the arm E², as best shown in Fig. 5, and is adapted to operate reversely to the spring E³. The spool G⁴ being loosely mounted can be revolved independently of the shaft G, while it is normally held to revolve with said shaft G by the pawl g^3 , which engages with the fixedly-mounted circular rack or detent G³. To raise or lower the hood, it is only necessary to disengage this spring-pawl g^3 and revolve the spool G⁴ to the desired point, after which by permitting the pawl g^3 to again engage with the ratchet the parts will be held to adjusted position. In the moving of the telescopic section back and forth, however, the relative position of the hood is not changed, as the diameter of the spool G⁴ is proportionally the same as that of the spool G², so that the rope g^4 is paid out or drawn in uniformly with the movement of said telescopic section D⁴. The hood therefore needs no attention in the ordinary manipulation of the telescopic trunk or chute, but is operated independently, notwithstanding its operating drum or spool is upon the same shaft as that by which the telescoping operation is effected.

The position and operation of the hoisting-derrick are best shown in Fig. 5. This derrick consists of the upright frame H, mounted on the same portion of the turn-table as that which carries the yoke F and carries in its upper part a winding drum or spool H', from which a rope H² runs to the sheave h^2 on the top of the yoke structure and returns thence and is connected to the frame H of the derrick. Upon one end of the shaft of the spool H' is a screw-gear h' , and running transversely to this is a worm H³, operated by a hand wheel or crank H⁴. The frame H is strongly braced by braces h and, as before explained, travels with the turn-table, so that the pull on the ropes is always in the same direction irrespective of the position of the straw-stacker.

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

1. A fan or discharger for pneumatic straw-stackers, the ingress-opening whereof is substantially central of one side of the fan-casing and the discharge neck or opening whereof is to one side of a central line drawn through said fan-casing, and the axis of the fan-shaft whereof is upon the opposite side of said central line, substantially as shown and described.

2. A fan or discharger for pneumatic straw-stackers the eye or ingress-opening whereof is substantially central of the fan-casing as a whole and in one side of said fan-casing, said fan-casing having a substantially peripheral discharge neck or opening, and a fan carried by a shaft extending through the other

side of the fan-casing, said discharge neck or opening being to one side of a central line drawn through the fan-casing, and said fan-shaft being upon the other side of such central line, whereby the greater portion of the ingress-opening through the fan-casing is upon that side of the fan-shaft nearest the discharge-opening, substantially as shown and described.

3. A fan or discharger for pneumatic stackers wherein the axis of the fan is beyond a central line drawn through the center of the fan-casing parallel with the neck forming the discharge-opening of said fan-casing, and also beyond the center of the ingress-opening in the side of said fan-casing.

4. In a pneumatic straw-stacker, the combination, with the trunk or chute, of a turn-table therefor composed of the upper and lower track-plates C' and C², and a revolving ring or plate C³ located between said track-plates, and provided with truck-bearings and openings through which the edges of the tracks may pass, and trucks c^3 mounted in said bearings and passing through said openings, and thus bearing against both said track-plates, substantially as shown and described.

5. The combination, in a pneumatic straw-stacker, with the trunk or chute thereof, of a turn-table composed of the upper and lower track-plates C' and C² grooved upon the facing sides thereof to form tracks, and a central movable plate or ring C³ attached to the stump of the trunk or chute, and saucer-shaped trucks c^3 mounted on said plate or ring and running in the grooves in the track-plates, substantially as and for the purposes set forth.

6. The combination, in a trunk or chute of a pneumatic straw-stacker, of the two telescopic sections D³ and D⁴, said section D³ being provided with the ribs d^3 and the rings or bands 1, 2 and 3, a suitable winding-drum at or near the lower end of the trunk or chute, a suitable sheave located at the outer end of the lower section of the trunk or chute between the ribs d^3 , and a rope running from said winding-drum to the lower end of the outer section D⁴, one end being attached thereto directly and the other first passing about said sheave, substantially as set forth.

7. The combination, with the trunk or chute of a pneumatic straw-stacker, of a mouth-piece or hood therefor composed of several sections mounted on common pivots, an arm also mounted on the pivot and rigidly secured to the lower section of the mouth or hood, a spring secured to one end of said arm whereby the hood is held normally to one position, and a rope running to a suitable winding drum or spool from the other end of said arm, substantially as and for the purposes set forth.

8. The combination, with the trunk or chute of a pneumatic straw-stacker, of a mouth composed of numerous small sections mounted on pivots, a chain connected to the end of the trunk or chute and at suitable points to each

of said sections, an arm mounted on the same
pivot with the sections and secured fixedly to
the lower one, a spring for holding the sec-
tions to their extreme unfolded position, and
5 a rope whereby the sections may be raised
and the mouth thus opened, thus permitting
the discharge to be nearer in line with the di-
rection of the trunk or chute, substantially as
shown and described.
10 9. A trunk or chute for pneumatic straw-
stackers the outer end whereof has its lower

side cut away for a short distance and plates
D⁵ secured thereto, and a hood pivoted to the
lower outer corners of said plates, substan-
tially as shown and described. 15

In witness whereof I have hereunto set my
hand and seal, at Indianapolis, Indiana, this
25th day of February, A. D. 1897.

WILLIAM SEBURN. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.