No. 775,611. PATENTED NOV. 22, 1904.

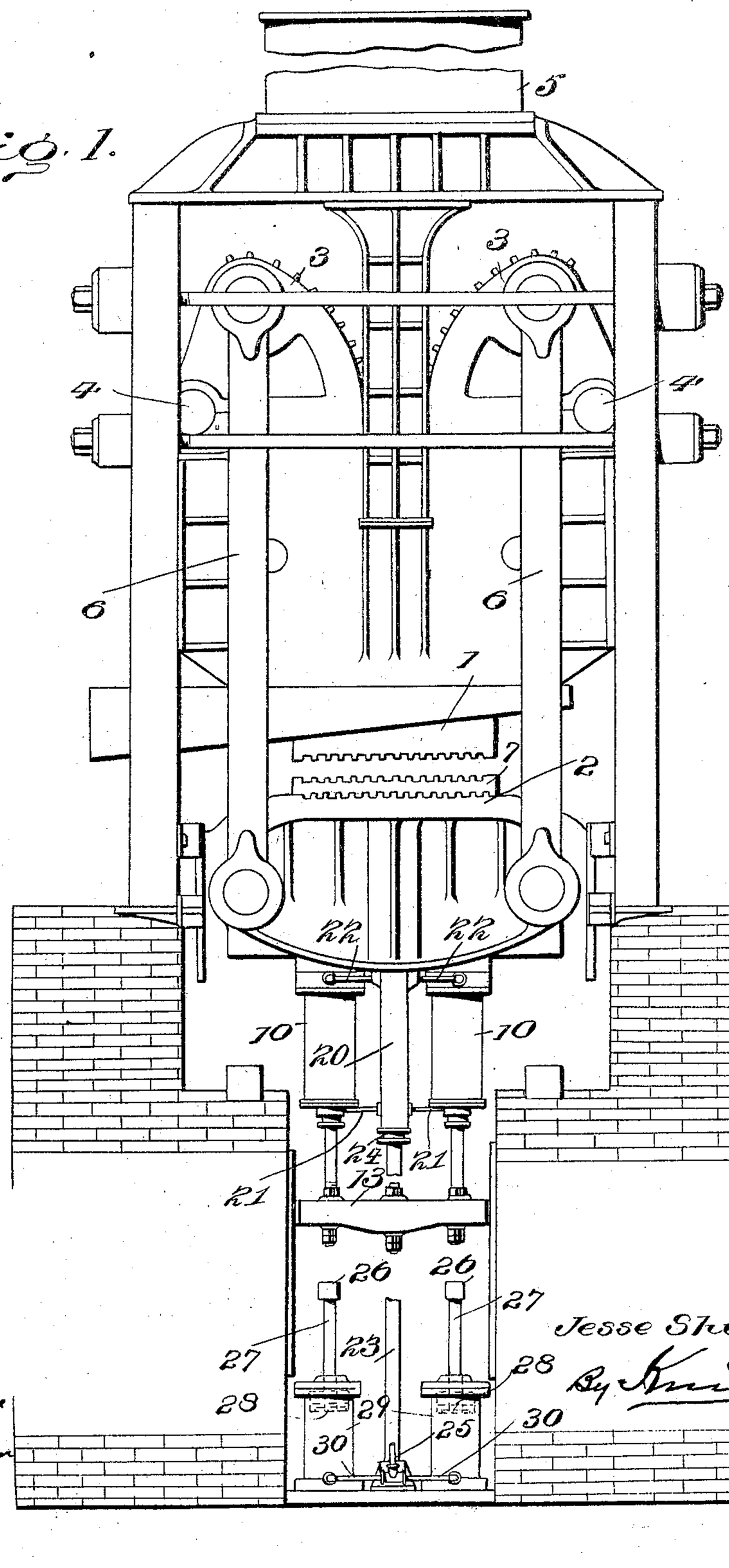
J. SHIPWAY.

COMPRESS.

APPLICATION FILED APR. 21, 1900.

NO MODEL. 7 SHEETS—SHEET 1.

Fig. 1.



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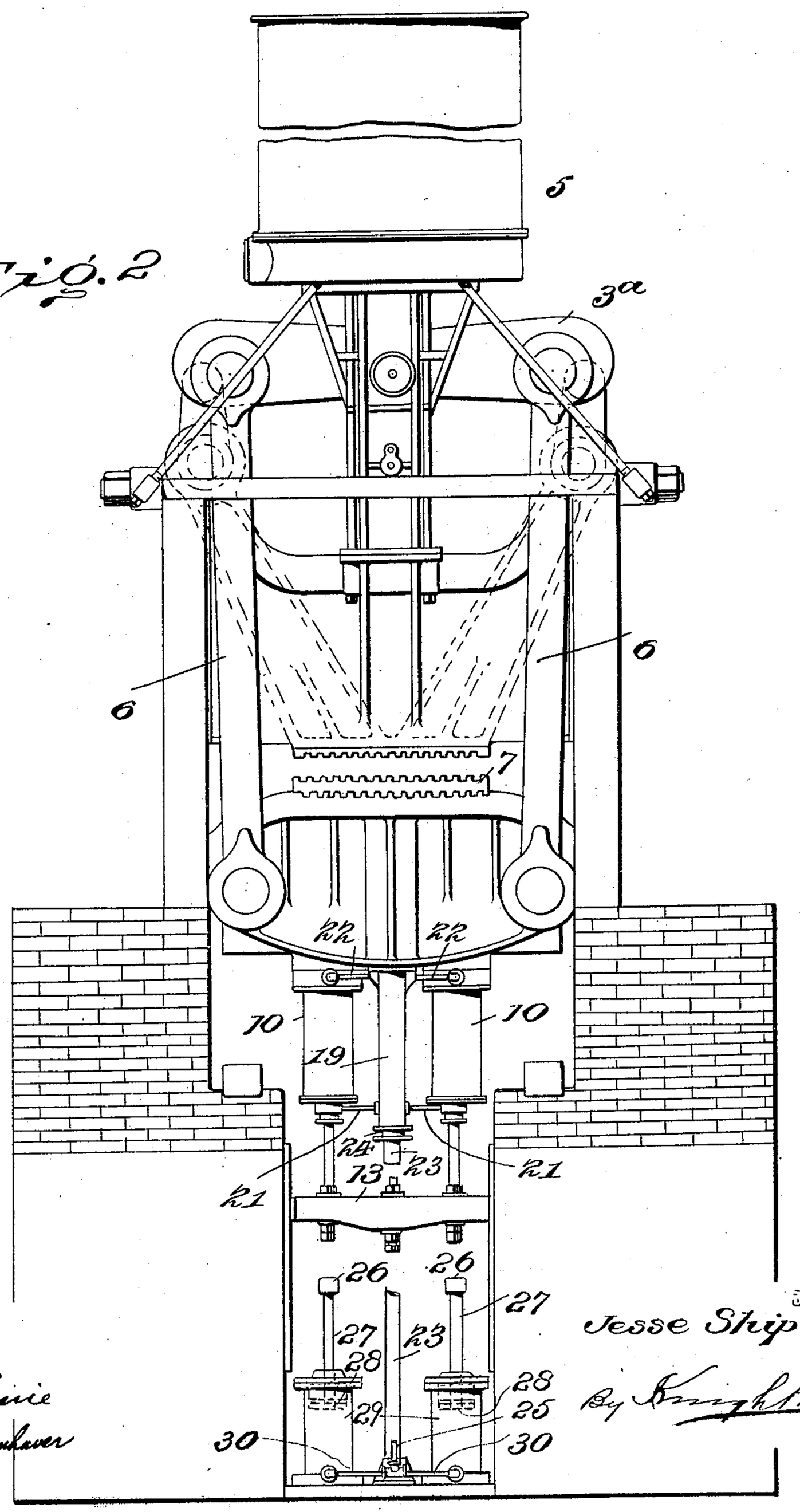
NO MODEL. 7 SHEETS—SHEET 2.

Fig. 2



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NO MODEL. 7 SHEETS—SHEET 3.

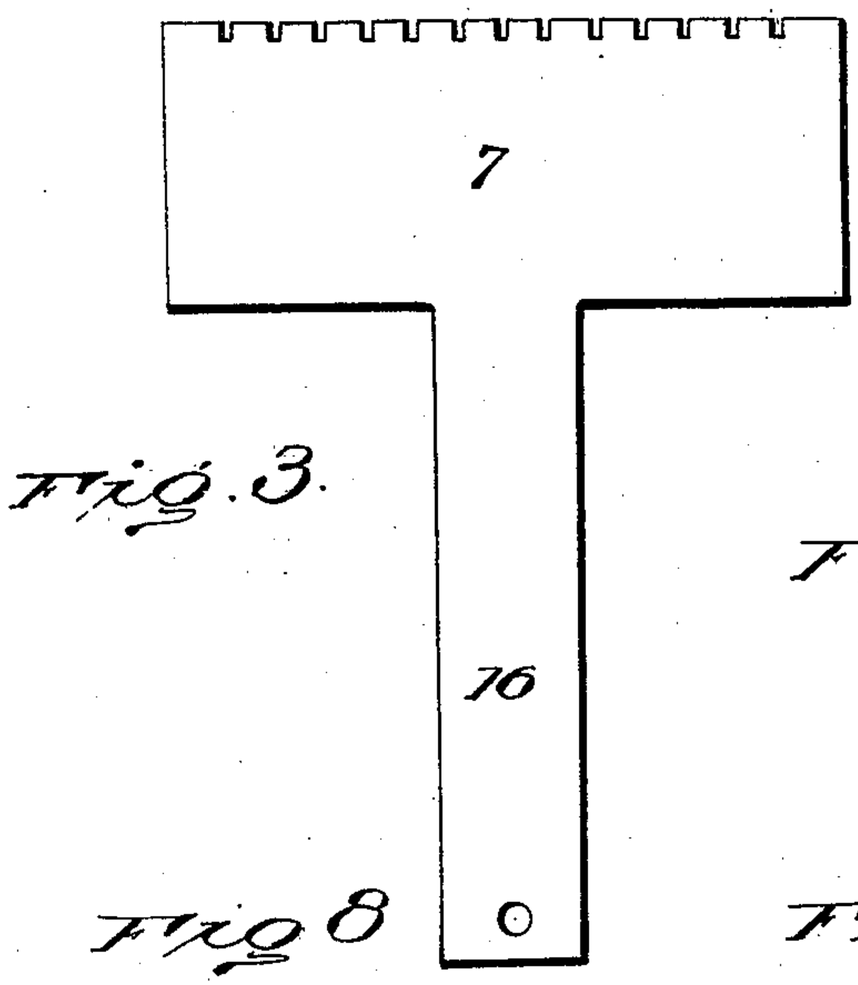

FIG. 3.

FIG. 4.

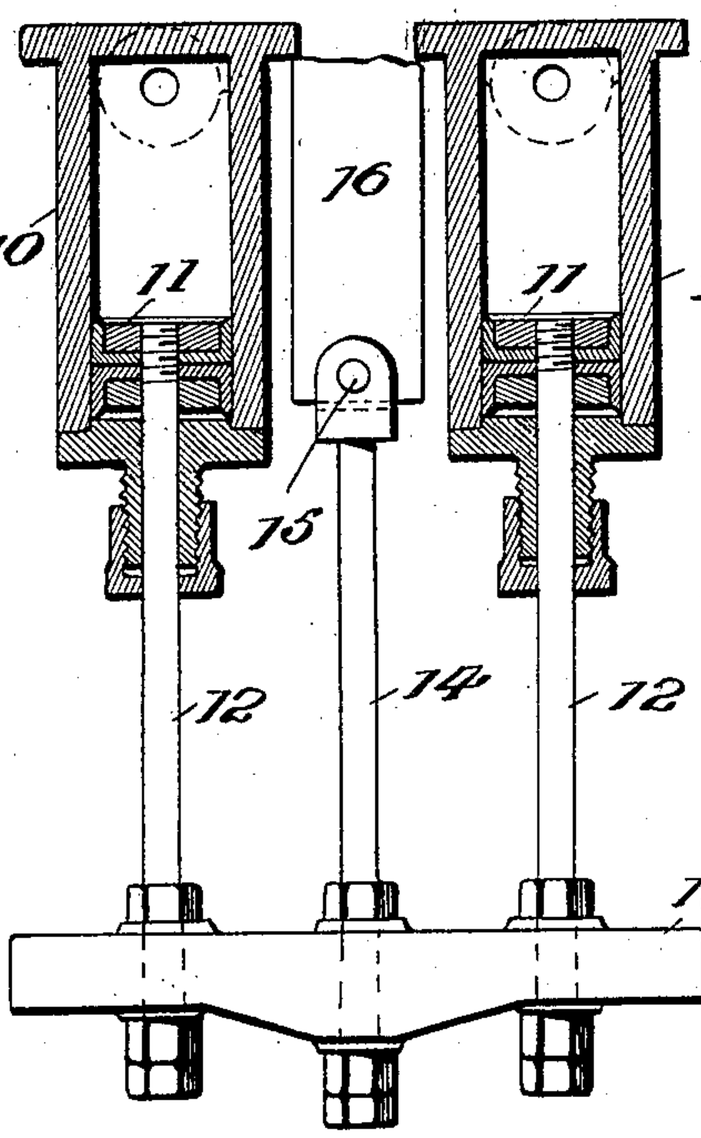

FIG. 8.

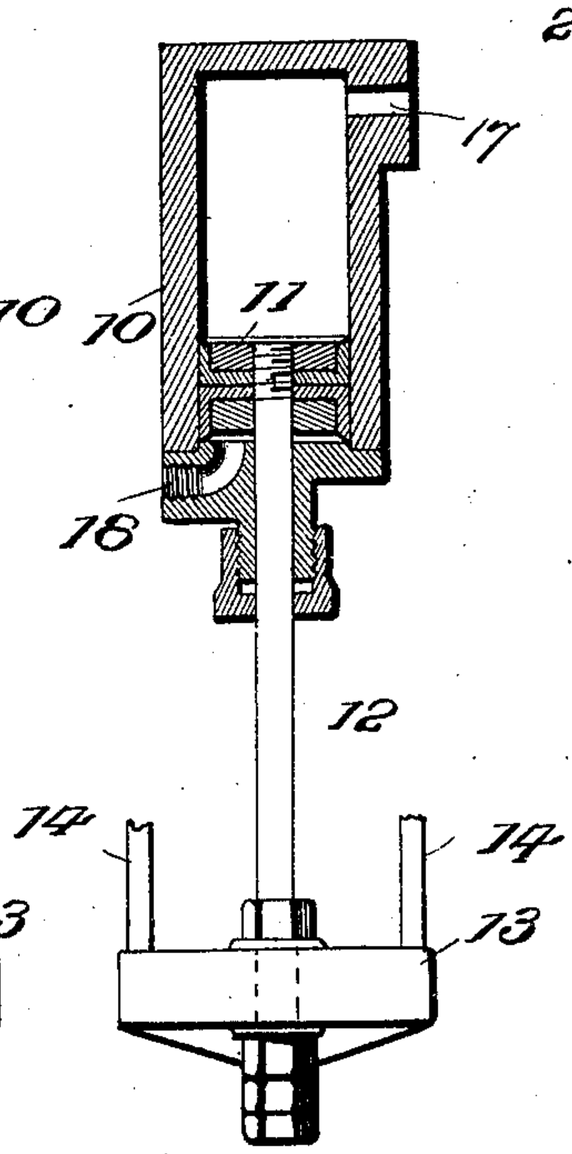

FIG. 9.

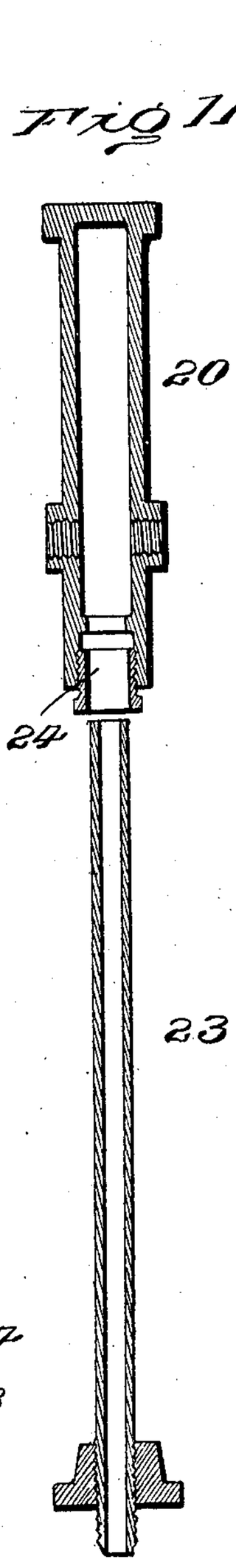

FIG. 11.

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NO MODEL. 7 SHEETS—SHEET 4.

Fig. 10

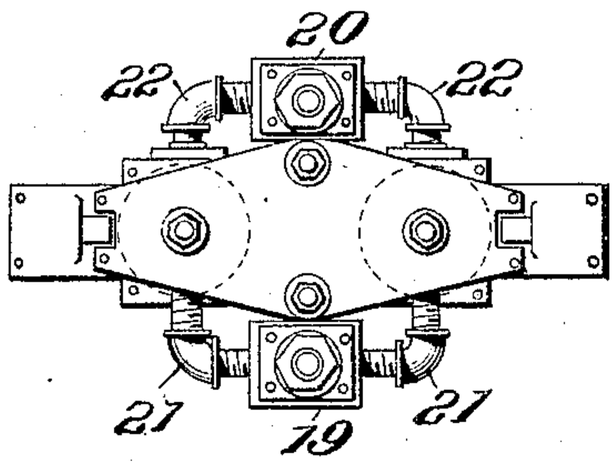


Fig. 5

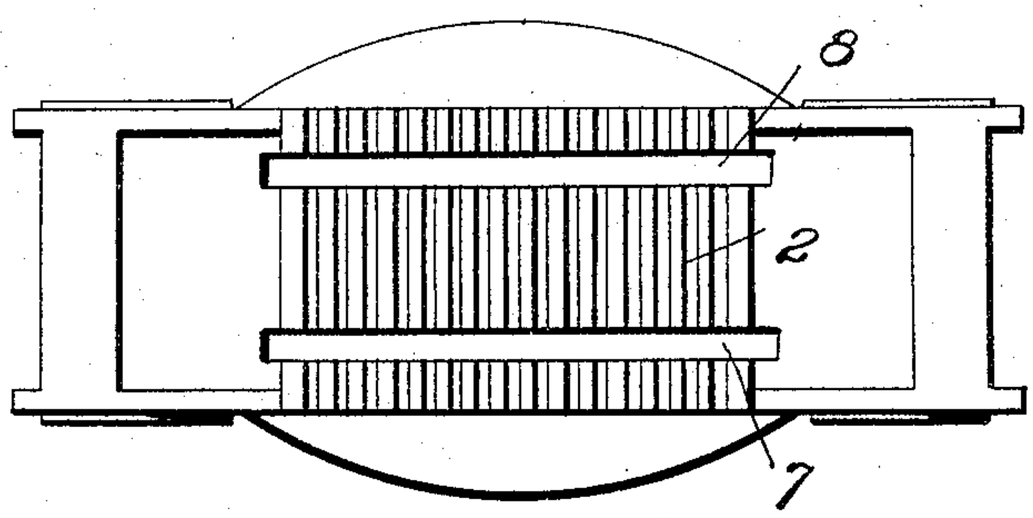


Fig. 6.

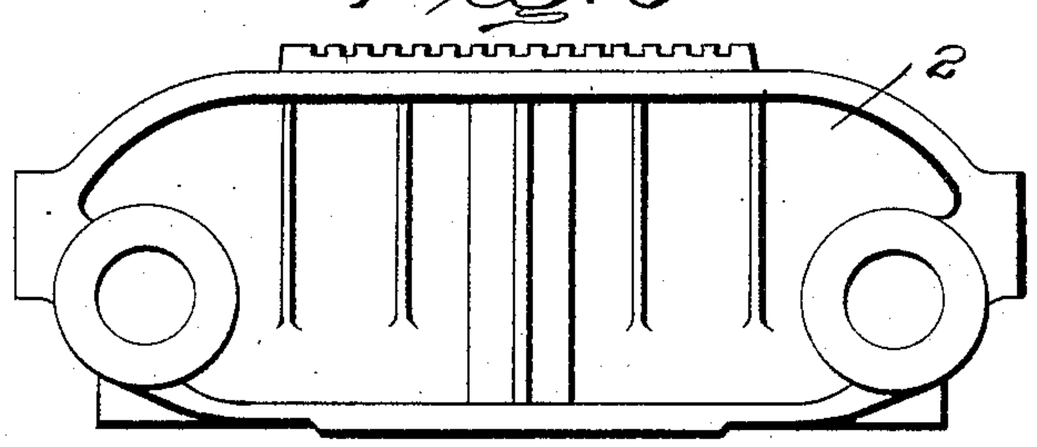
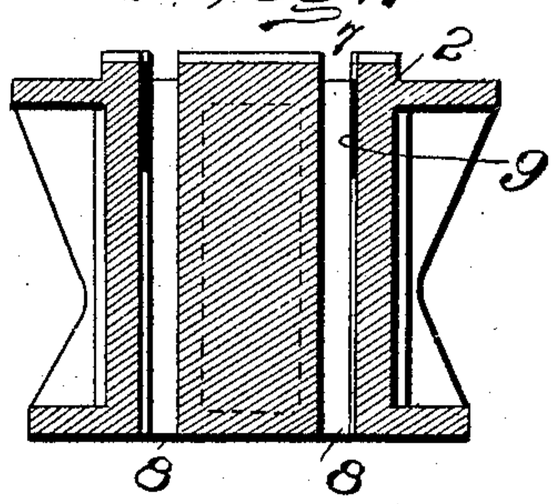


Fig. 7.



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NO MODEL. 7 SHEETS—SHEET 5.

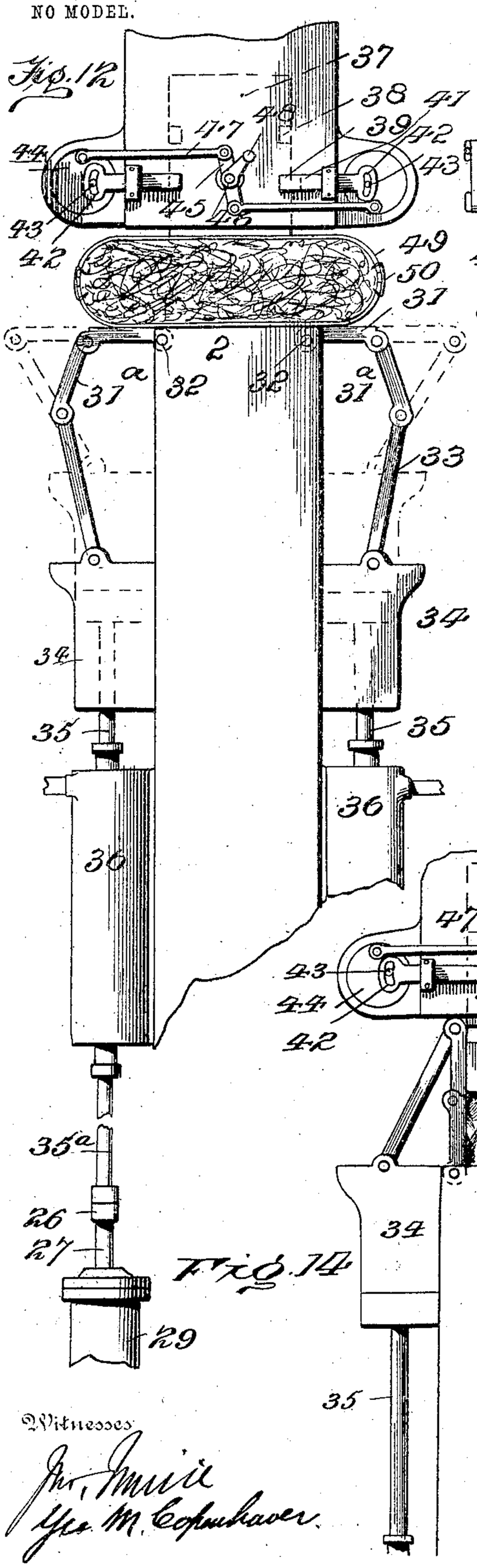

Fig. 12.

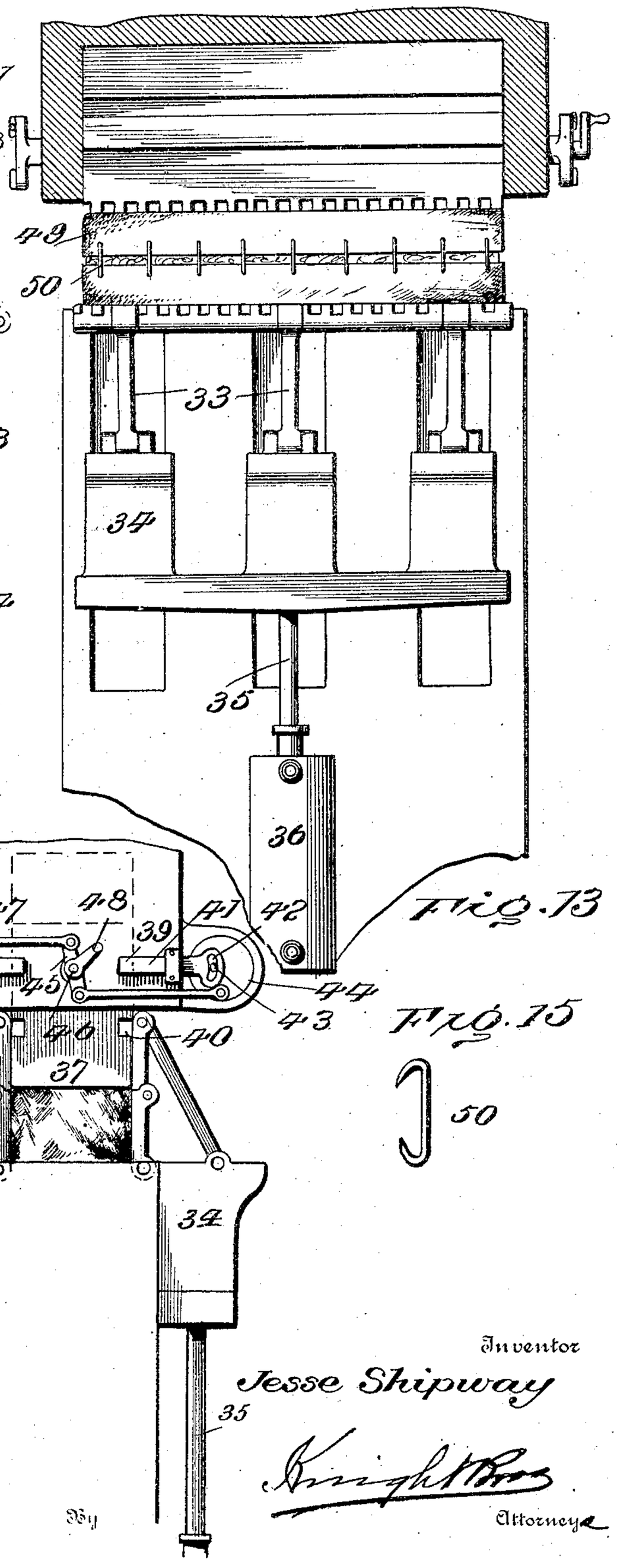

Fig. 13.

Fig. 15.

Fig. 14.

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APPLICATION FILED APR. 21, 1900.

NO MODEL. 7 SHEETS—SHEET 6.

Fig. 16.

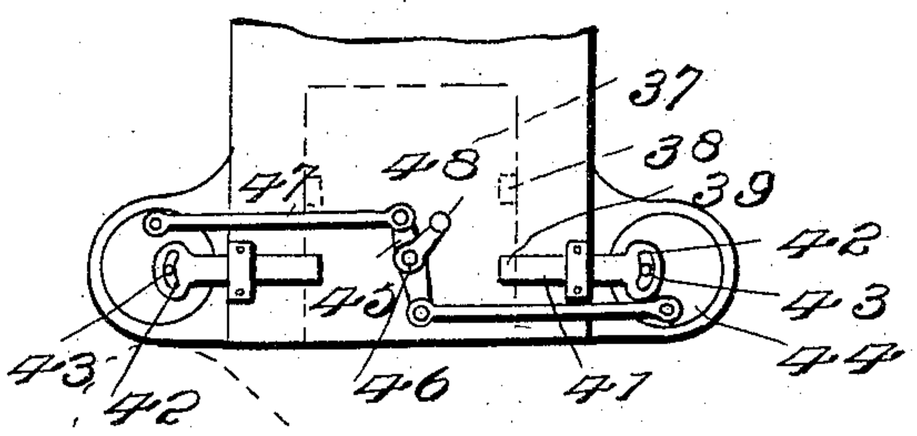
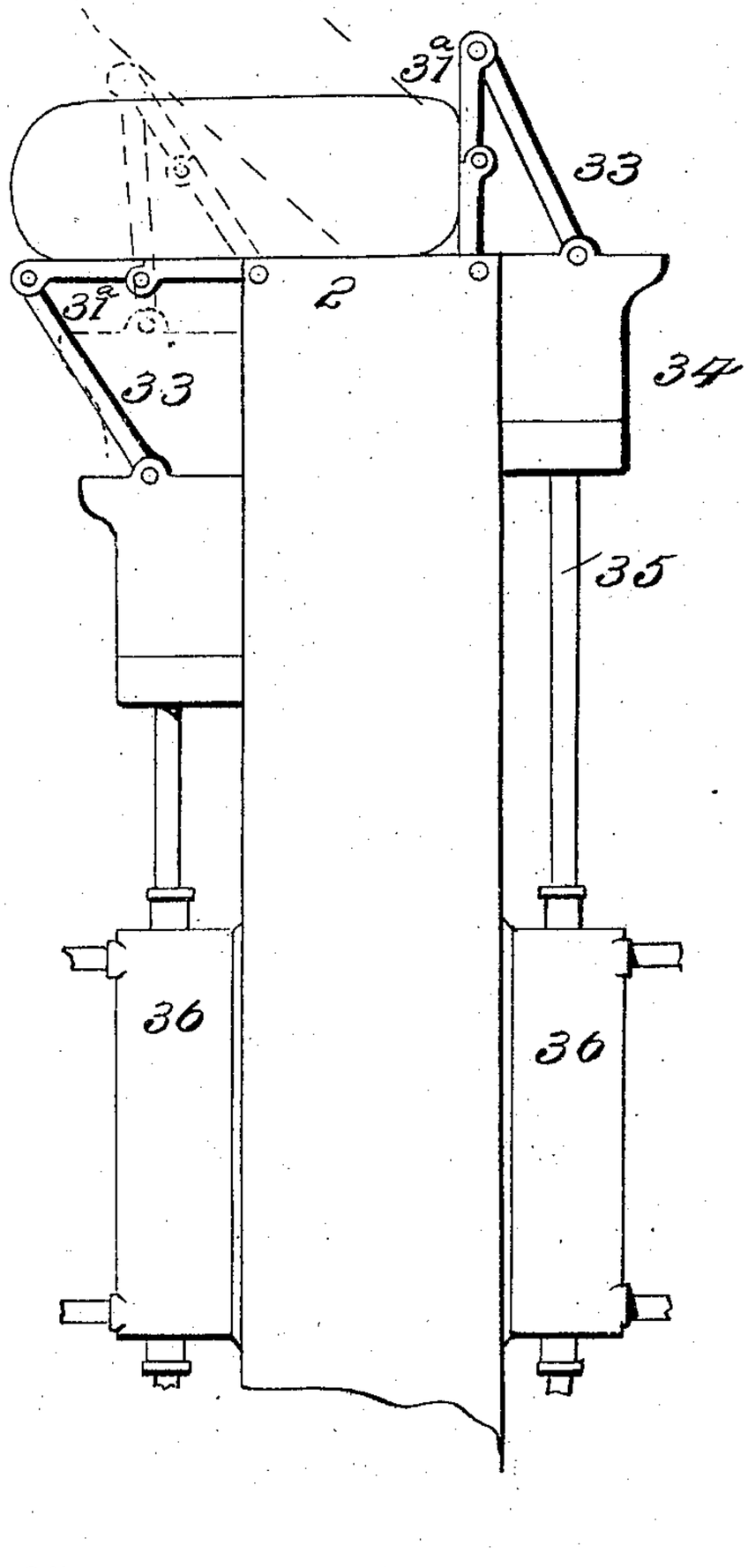
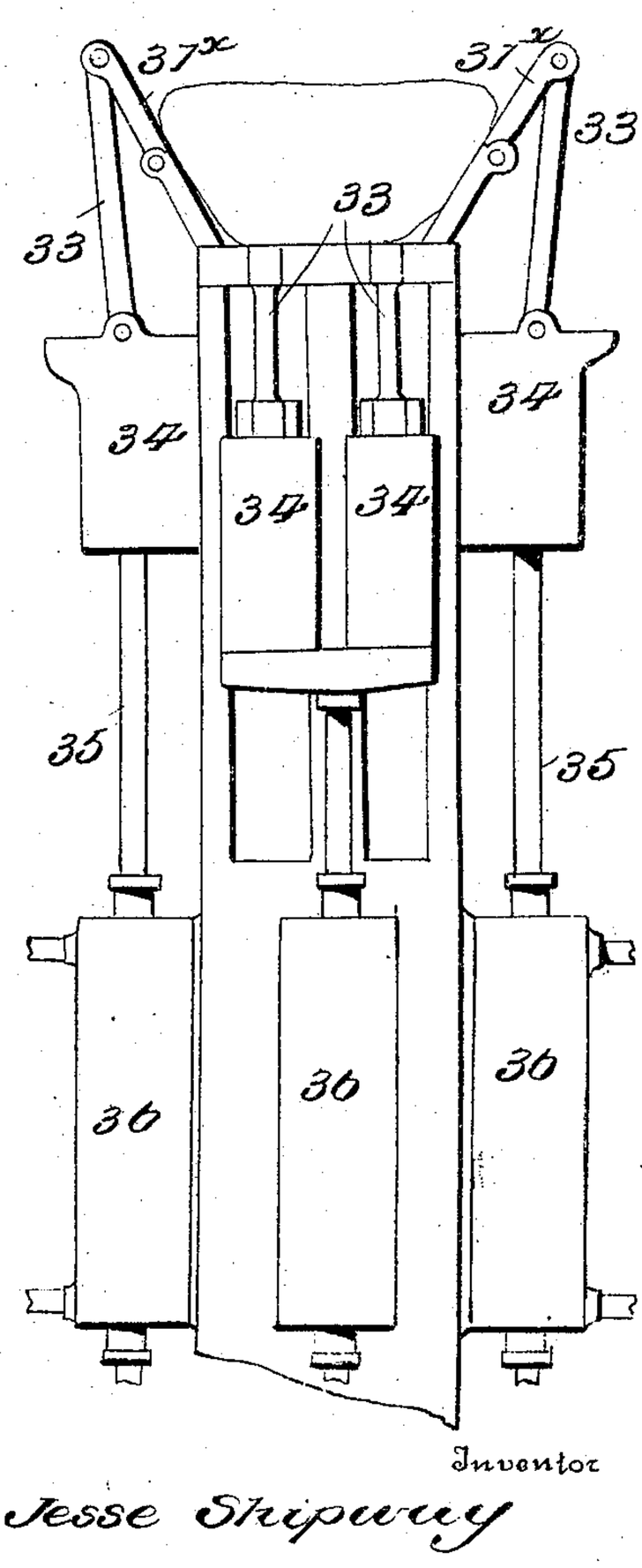


Fig. 17.





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No. 775,611. PATENTED NOV. 22, 1904.

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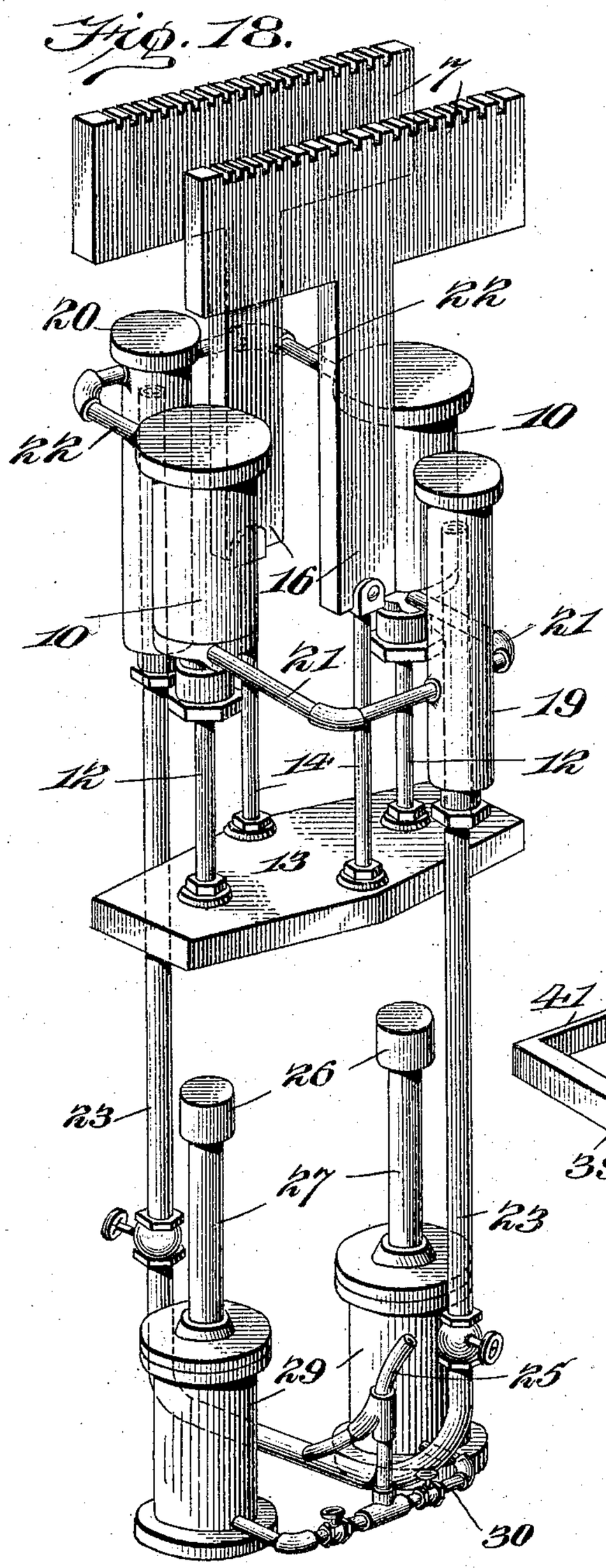
APPLICATION FILED APR. 21, 1900.

NO MODEL. 7 SHEETS—SHEET 7.

Fig. 18.



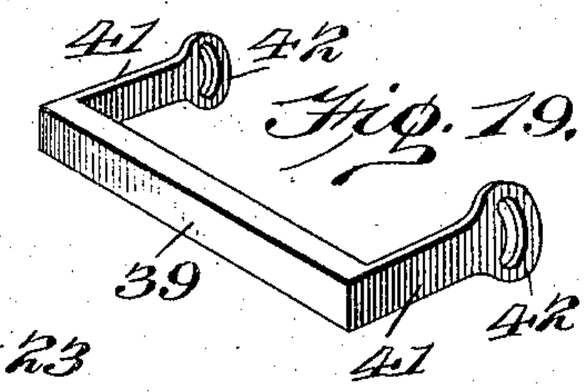


Fig. 19.

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No. 775,611. Patented November 22, 1904.

UNITED STATES PATENT OFFICE.

JESSE SHIPWAY, OF MEMPHIS, TENNESSEE.

COMPRESS.

SPECIFICATION forming part of Letters Patent No. 775,611, dated November 22, 1904.

Application filed April 21, 1900. Serial No. 13,784. (No model.)

To all whom it may concern:

Be it known that I, JESSE SHIPWAY, a citizen of the United States, and a resident of Memphis, in the county of Shelby and State of Tennessee, have invented certain new and useful Improvements in Compresses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to compresses employed for the purpose of condensing bales of cotton and other like fibrous material in the direction of more than one of its dimensions, as described in United States Letters Patent No. 590,158, granted September 14, 1897, to S. R. Montgomery, and also described in my copending application, Serial No. 739,013, filed December 2, 1899, and in which plates or sides are employed in connection with the platens to produce a compression-chamber of reduced transverse dimension that will confine the bale in the direction and within the limit of its first compression while the second compression is taking place. In compresses of this class I have found it desirable to mount the sides or plates upon the moving platen and to so arrange them that they may be employed to perform additional functions.

One object in mounting the sides or plates upon the lower moving platen is to permit a manipulation not attainable with the sides or plates mounted upon the upper fixed platen—that is to say, with the plates or sides mounted upon the lower platen after the first compression the lower platen is dropped a short distance—and the plates simultaneously are subsequently projected to form a compression-chamber. It is then only necessary to shift the bale slightly to permit it to drop into the compression-chamber thus formed, after which the second compression may take place. This arrangement I have claimed, broadly, in my former application, and I have found that such an arrangement admits of automatically projecting the confining sides or plates by the dropping of the platen, this being accomplished by a suitable arresting means with which the controlling connections of said plates or sides engage, so that the downward movement of the plates with the platen will be arrested, and the platen will thereafter continue independently of the plates a sufficient distance to cause the projection of the plates. This arresting means is preferably in the form of fluid-pressure buffers, the cylinders of which have connections for controlling the admission of fluid-pressure, so that after the second compression takes place and the lower platen is again dropped the plates may likewise drop or be forced downward to release the final bale. While I have as one embodiment shown these buffers arranged with the construction shown in my former application, I prefer to employ a hinging type of plates or sides in such relation to one of the platens, preferably the lower platen, that they may be swung inward into such relation to the platen as to form therewith a reduced compression-chamber. One object in using the hinging type of plates or sides is to facilitate the opening and closing of the chamber, all friction incident to sliding movement of the plates after compression has taken place between them being obviously avoided by plates or sides that swing outwardly on their hinges. Another object in using this type of sides or plates is to facilitate the handling of the bale in subjecting it to two separate compressions by the platens. it being practicable with the hinging sides or plates to operate them successively, so that the first swings up into position and shifts the bale laterally upon the platen, after which the opposite plate or side may swing up into position and by its movement stand the bale up on end within the reduced compression-chamber formed by the plates or sides. A further important object in using this type of plates or sides is to accomplish a preliminary reduction in one or more of the dimensions of the bale by swinging both sides inward simultaneously. This feature would be utilized more especially for the purpose of justifying the lengths of the bales and rendering the product of the press uniform in length. This feature could likewise be used, however, under proper conditions to accomplish one of the transverse condensations which it is the object of my compress to effect. In utilizing this feature for justifying the length of

bales I would prefer to employ two pairs of sides or plates—that is to say, a pair in addition to those already referred to—and to locate said additional pair of sides or plates at the ends of the platen of an old type of compress generally known as the "Morse" compress, so that when they swing up into position they would press in the more or less yielding ends of the bale, so as to confine the length of the bale to the length of the compression-chamber in which compressions take place. This is the most important feature, for the reason that shippers now offer great objection to bales of unequal length, for the obvious reason that when one layer of bales is introduced into the vessel, the bales being stood on end, the upper surface is so uneven as to prevent loading the vessel to its full tonnage, notwithstanding the extreme condensation which is accomplished by compression in a plurality of transverse directions.

With the foregoing objects in view I will proceed to describe several embodiments illustrative of the various features of my present invention, reference being had to the accompanying drawings, in which—

Figures 1 and 2 are front elevations of two well-known types of compresses to each of which one form of my present invention—to wit, that employing vertically-sliding plates—is applied. Figs. 3 to 11, inclusive, represent by detail views the various parts employed in the adaptation of my invention to the compresses illustrated in Figs. 1 and 2, Figs. 3 and 4 being respectively a side and an edge view of one of the plates or sides, Figs. 5, 6, and 7 being respectively a plan, a side view, and a vertical transverse section through the lower moving platen slotted to receive said plates or sides, Figs. 8 and 9 being transverse sections in different planes of the fluid-pressure-controlling means for said plates, Fig. 10 being a plan of the fluid-pressure connections, and Fig. 11 being a sectional detail view of the telescoping pipe through which fluid-pressure connection is maintained with the plate-actuating cylinders without interfering with the vertical movement of the lower platen upon which the plates and their controlling-cylinders are mounted. Figs. 12 to 17, inclusive, represent a different type of sides or plates as well as the various uses to which they may be put and functions which they may be made to accomplish, Figs. 12 and 13 being respectively end and side views, the latter showing the upper platen in section, Fig. 14 being a view corresponding to Fig. 12 with the sides in a different position and the die dropped down, Fig. 15 being a detail view of one of the securing hooks, Fig. 16 being a view corresponding to Figs. 12 and 13, but showing the automatic shifting of the bale by the successive movements of the sides, and Fig. 17 suggesting the compression or reduction in transverse dimension of the bale by the simultaneous upward and inward movement of the sides. Fig. 18 is a general view showing the connections between the power-supplying cylinders and the plate-elevating cylinders and also showing the telescoping connections with said cylinders first named. Fig. 19 is a perspective view of part of the means for holding the supplemental plunger in its various positions.

Referring to Figs. 1 and 2, 1 represents the upper or fixed platen of the press, and 2 the lower movable platen. In Fig. 1 vertical movement is imparted to the lower moving platen through the medium of toothed segments 3, fulcrumed at 4, engaged in the well-known manner by a toothed rack, (not shown,) which is intended to be moved vertically by a piston working in the cylinder 5, said segments being connected by lifters 6 with the lower platen that is to be moved. In the type of press shown in Fig. 2 vertical movement is imparted to the lower platen by the cylinder 5, which controls the cross-head 3^a, that is connected to the lower platen through the lifters 6. As these features have no special bearing upon my present invention, a more detailed description is unnecessary.

In applying the sliding type of plates or sides 7 to the lower platen said plates are made thin and approximately equal in width to the platen in which they work, and said platen is slotted, as shown at 8 in Figs. 5 and 7, so as to provide vertical ways in which said plates may move from a position with their upper edges flush with the surface of the platen, which position they will assume when the full surface of the platen is required for a first compression to a position raised sufficiently above the surface of said platen to form the reduced compression-chamber for the second compression. The slots or ways 8 are preferably faced with antifriction metal 9, such as bronze or equivalent material, in order to reduce the friction of the plates sliding therein.

To control the movements of the plates or sides relatively to the platen, cylinders 10 are mounted on the under side of the platen, so as to be carried thereby, and these cylinders contain pistons 11, Figs. 8 and 9, the rods 12 of which support a cross-head 13, from which project connecting-rods 14 at opposite sides of its middle, and these rods 14 are attached at 15 to the controlling-shank 16 of the plates 7. As shown more clearly in Fig. 9, fluid-pressure may be introduced and exhausted above the pistons 11 through the opening 17 and below the pistons through the opening 18. Fluid-pressure is introduced to the upper openings 17 of the respective cylinders 10 from the chamber 19 and into the lower openings 18 of said cylinders from the chamber 20. (See Figs. 10 and 1.) These chambers are likewise carried on the lower platen and stand in constant communication with the openings 17 and 18 through the pairs of pipes 21 and 22,

respectively. One of these chambers is shown in section in Fig. 11, together with the telescoping pipe 23, that works through a stuffing-box 24 in the end of said chamber, and thus maintains fluid-pressure connection with the chamber 20 or 19 from a fixed point outside the press, notwithstanding the vertical movement of the platen and the parts mounted upon it. The connection of the pipes 23 with pressure-supply or exhaust-ports will be regulated in any suitable manner, communication being effected through a pipe 25. (See Figs. 1 and 2.)

The matter so far described is shown and claimed in my previous application, and while means is thus provided for positively moving the plates vertically at will it is desirable to automatically move said plates relatively to the platen upon the descent of the latter, so that the reduced compression-chamber will be formed simultaneously with the opening of the press, and thus save time in operation, which is a most important feature in compressing. To accomplish this, I locate beneath the cross-head 13 arresting-buffers 26, comprising rods 27, pistons 28, and cylinders 29, the pistons being held up by fluid-pressure introduced beneath them through pipes 30 when it is desired to have the buffers act. When the press is being opened for first compression, at which time the full area of the platen is used, the buffers 26 are allowed to settle by withdrawing the pressure from beneath them.

The operation of the above-described mechanism is as follows: It being desired to compress a plantation-bale, the buffers 26 are allowed to remain down, the plates 7 are flush with the platen 2, and the press is open. The bale is then introduced, and the platen moves upward to accomplish first compression. Any suitable securing means is employed for holding this first compression. The lower platen is then permitted to descend, the buffers 26 being at the same time raised in effective position. As the platen descends the bale is drawn far enough to permit one side to clear one of the plates 7. As the platen moves down the cross-head 13 is arrested by the buffers 26, and continued downward movement of the platen causes the projection of the plates 7 to form the reduced compression-chamber. The other plate rises beneath the bale, tips the latter automatically into the reduced compression-chamber by the time the platen reaches its lower limit, and the latter may ascend for final compression. To hold the plates up, pressure is now introduced beneath the pistons 11 in the cylinders 10, and the bale is thus confined in the reduced compression-chamber and in the direction of first compression while the second compression is taking place; but the pressure introduced beneath the pistons 11 is only sufficient to hold the plates elevated and not sufficient to oppose the approach of the platens, so that the plates 7 will yield proportionally to the approach of the platens, a safety-valve or blow-off suitably adjusted being preferably provided in the pressure-pipe that supplied the cylinders 10 to permit this action to take place. The second compression being accomplished, the ties are applied to the bale, the lower ends of the cylinders 10 are open to exhaust, and pressure is introduced above the pistons 11, and the plates are forced down to leave the finished bale exposed for removal.

Referring to Figs. 12 to 17, inclusive, 31 represents the hinging type of sides or plates having a hinging connection at 32 with the lower platen 2 and controlled through pitmen 33 from the sliding blocks 34, that are moved vertically by the rods 35 of pistons working in cylinders 36. Fluid-pressure may be introduced at either end of each cylinder 36 in a manner substantially similar to that described with reference to the cylinders 10. The sides 31 are preferably formed with a hinging section 31^a, which folds down when the sides are open to avoid obstructing access to the press when it is necessary to handle the bale. A further advantage accrues, however, from this construction, in that the controlling connections operate with greater advantage and a toggle-joint connection is provided. If this type of side is used in an operation in which both compressions are effected by the press-platens, the removable sides occupy the position shown in Fig. 12 during the first compression. After this has taken place and the bale is secured one of the sides 31 is straightened up by its controlling-cylinder, and this imparts a lateral movement to the bale, pressure having been released by the downward movement of the platen. (See Fig. 16.) The other side is then straightened up by the cylinder 36, and this accomplishes the lifting of that side of the bale and causes the bale to drop edgewise, or with its narrowest side downward, into the reduced compression-chamber which has now been formed between the two sides. To adapt the upper or fixed platen to now exert compression upon the reduced-width bale, said upper platen is provided with a reduced die 37 of proper width to work between the sides 31, and this die is brought into position to project beneath the upper platen a sufficient distance to enter between the sides and accomplish the final compression, as shown in Fig. 14. One plan for movably mounting the projecting die on the upper platen is suggested in the drawings, which show it as a sliding block working in a housing in the platen. To hold this sliding die in this position with sufficent strength to resist the great pressure imposed upon it, I form said die with transverse grooves 38, which are brought opposite locking-bars 39, that may be moved into said grooves. Said locking-bars also serve to hold the die 37 elevated by entering

grooves 40 when the die is in its upper position with its face flush with the upper platen, at which time it forms a part of the pressure-surface of the latter. To conveniently move the locking-bars 39 inward at will, they are connected at their ends to thrust-bars 41, formed with segmental slots 42 at their outer ends, that engage with eccentric studs 43 in rotary disks 44, while said disks 44 may be rotated simultaneously by the rock-arm 45, pivoted at 46, connected to said disks through the medium of pitmen 47 and controlled by a crank-lever 48. The die 37 moves to its lower position by simply releasing the locking-bars 37 and permitting it to recede within the upper platen under pressure of a bale introduced between the platens when first compression is taking place, the die being held in its elevated position by returning the locking-bars to their inner positions. Any other suitable means may be employed for introducing and withdrawing a projecting block or die beneath the upper platen. From the foregoing description it will be observed that I have provided another type of means for reducing the horizontal dimension of the compression-chamber and have combined therewith means for readily providing an upper plunger of reduced horizontal dimension in the form of the die 37.

The form of securing means which I prefer to employ for holding the bale against undue expansion after the first compression consists of a pair of covers 49, (shown in Figs. 12 and 13,) the edges of which are brought together by the first compression, and securing-hooks 50, (shown detached in Fig. 15,) which may be readily caught into the edges of the covers by operatives on opposite sides of the press without delaying or interfering with the operation. These hooks are as readily removed after the bale has entered the reduced compression-chamber or at any other time that may be convenient prior to final compression and discharge of the bale.

In addition to the pair of confining plates or sides 31, operating to automatically reverse the bale and to confine it in the direction of first compression, I may also employ a second pair, $31^{\times}$ or $31^{a\times}$, of these hinging sides, as shown in Fig. 17, in such positions that they may be moved up at the proper time to condense the ends of the bale prior to the first compression taking place. This use of the hinging sides accomplishes a most important result in that it will reduce bales to a common length or justify the length of bales, and thus make the baled article much more desirable for shipment. I may also so construct these parts as to accomplish one of the condensations or compressions thereby, it being obvious that if the hinging sides 31 were moved up into place simultaneously they would apply pressure laterally upon the bale and accomplish the first compression without the use of the platens, the only compression effected by the latter being then made to follow through the medium of the reduced die 37.

Instead of moving the sides 31 upward successively, as suggested in Fig. 16, to accomplish an automatic shifting of the bale, said sides may be moved upward simultaneously, as suggested in Fig. 17, by the admission of fluid into both cylinders 36 or by having both buffers in operative position and by that movement condense the bale in the direction of one of its dimensions. This may be done with the two lateral sides 31 and one of the ultimate compressions thereby accomplished, or it may be done by the other pair of sides, $31^{\times}$ $31^{a\times}$, as shown in Fig. 17, for the purpose of reducing the length of the bale, and thus justifying or rendering uniform in length the product of the compress. Obviously the hinging plates may be operated automatically, as suggested in Fig. 12, by extending each controlling piston-rod 35 downward through the lower head of its cylinder 36, as shown at 35^{a}, and locating beneath it an arresting-buffer 26 in the same manner as described with reference to Figs. 1 and 2.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In combination with a compress, having a movable platen, plates or sides mounted upon the movable platen through the medium of a hinged joint and movable by a swinging motion inward to provide a compression-chamber of reduced horizontal dimensions; substantially as described.

2. In combination with a compress, having a lower movable platen, movable plates or sides mounted by a hinged joint to the lower movable platen, to permit their swinging inward to reduce or confine, horizontally, the bale resting upon said platen, and means for forcing said plates or sides inward; substantially as herein set forth.

3. In combination with a compress, having a lower movable platen, plates or sides hinged to the lower movable platen and movable into position to form, in connection therewith, a reduced compression-chamber, and pressure-cylinders having pistons connected with said plates or sides; substantially as set forth.

4. In combination with a compress having fixed and movable platens, hinged plates or sides mounted in movable relation to one of the platens for the purpose set forth, and formed in hinged sections whereby the plates or sides fold in moving away from the platen, and means for extending said plates or sides and moving them upon their hinges in position to form with the platen a reduced compression-chamber.

5. In combination with a compress having fixed and movable platens, hinged plates or sides mounted in movable relation to one of the platens and formed in hinged sections, and

means for controlling the movements of said plates or sides, connected therewith through the medium of pitmen.

6. In combination with a compress having fixed and movable platens having hinged plates or sides to form a compression-chamber in connection with one of the platens, means for controlling the movement of said plates or sides, and an arresting means in the path of said controlling means, whereby the hinged plates or sides are operated automatically upon the movement of the platen; substantially as herein explained.

7. In combination with a compress having fixed and movable platens, plates or sides hinged upon the movable platen of said compress, vertically-movable connections for controlling said plates or sides, and arresting stops or buffers located in the path of said vertically-movable connections and engaging therewith when the platen moves downward in order to operate the sides; substantially in the manner and for the purposes set forth.

8. In combination with a compress having fixed and movable platens, hinged plates or sides mounted on the movable platen of said compress, connections through which said hinged plates or sides are operated, and arresting-buffers comprising cylinders, pistons working in said cylinders, and rods extending from the pistons in the path of the controlling connections; substantially as set forth.

9. In combination with a compress having fixed and movable platens, hinged plates or sides mounted on the movable platen of said compress, cylinders containing pistons connected with the movable plates or sides for controlling them, and arresting-buffers located in the path of parts through which said sides are controlled; substantially as and for the purposes set forth.

10. In combination with a compress having fixed and movable platens, two pairs of hinged plates or sides located in movable relation to one of the platens of said compress, each pair forming in connection with said platen two opposite sides of a compression-chamber, and means for swinging said plates to cause them to compress material placed upon the platen between them.

11. In combination with a compress, a lower movable platen, hinged sides or plates mounted in movable relation to the lower movable platen of said compress, and means for forcing said hinged plates or sides inward to compress a bale in the direction of one of its horizontal dimensions; substantially as set forth.

12. In combination with a compress having fixed and movable platens, plates or sides providing a reduced pressure-chamber in connection with one of the platens thereof, and means for reducing the pressure-face of the other platen to adapt it to enter the reduced compression-chamber; substantially as herein set forth.

13. In combination with a compress having fixed and movable platens, plates or sides movable in relation to one of the platens of the compress to form in connection therewith a reduced compression-chamber, and a block or projection of reduced section movable into position between the platens to enter the reduced compression-chamber; substantially as set forth.

14. In combination with a compress having fixed and movable platens, means forming a reduced compression-chamber on one of the platens, and a reduced pressure-block projecting from the other platen and adapted to enter said reduced compression-chamber; the sides of said reduced compression-chamber and the pressure-block being movable relatively to the respective platens upon which they are mounted to leave the platens intact for compressing with the full area of their pressure-faces.

15. In a compress, the combination of two platens, sides movable relatively to the platens to form a compression-chamber, means for moving said sides, and means automatically actuating said side-moving means upon the separation of the platens.

16. In a compress, the combination of a movable platen, sides carried thereby, moving relatively to the platen to form a compression-chamber, means for moving said sides, and means automatically actuating the side-moving means upon the receding movement of the platen.

17. In a cotton-compress, the combination of a movable platen, hinged plates secured thereto, and means for automatically operating said plates upon the receding movement of said platen.

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Witnesses:
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