

No. 763,005.

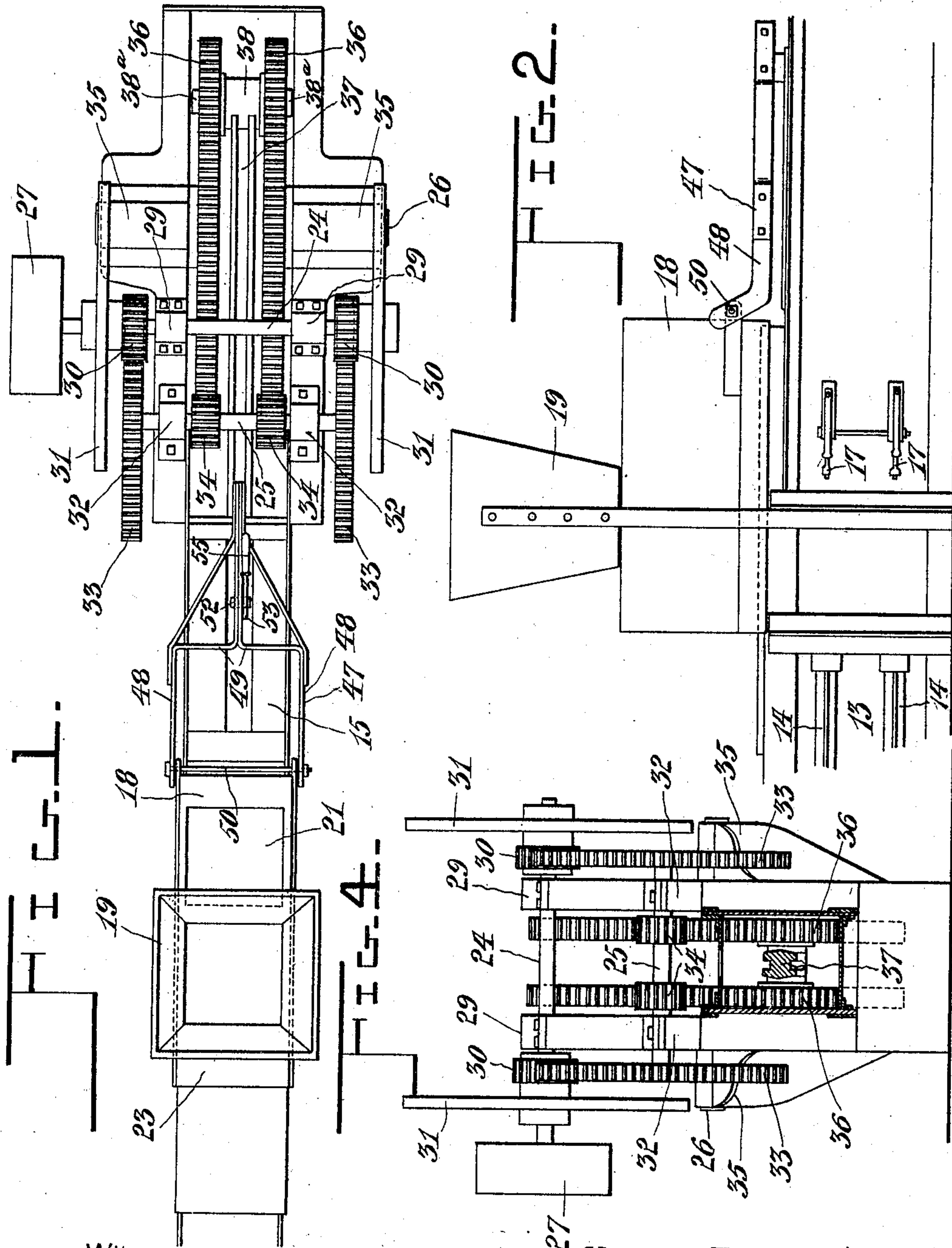
PATENTED JUNE 21, 1904.

H. LAROSE.
BALING PRESS.

APPLICATION FILED AUG. 10, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:

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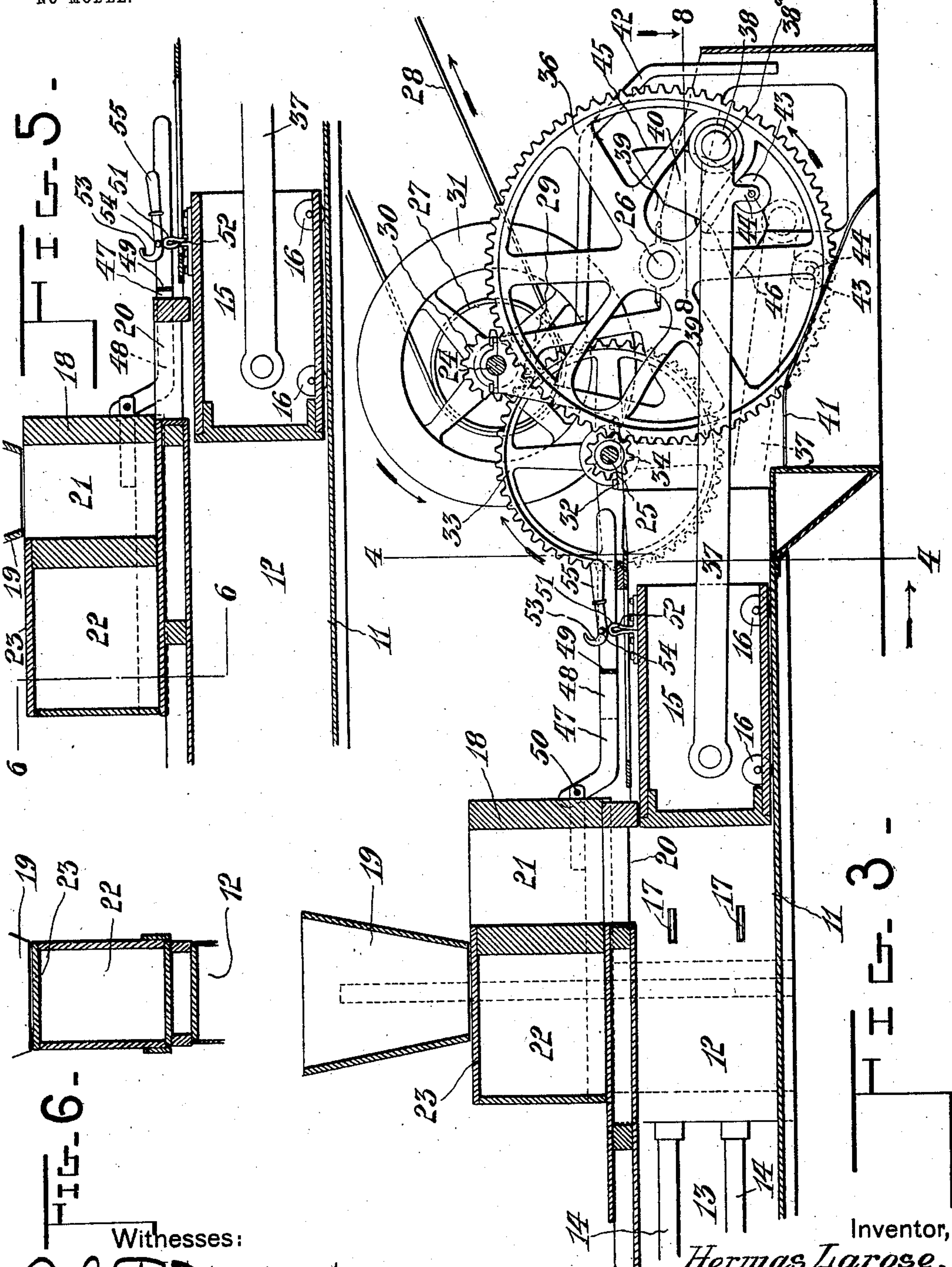
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4 SHEETS—SHEET 2.



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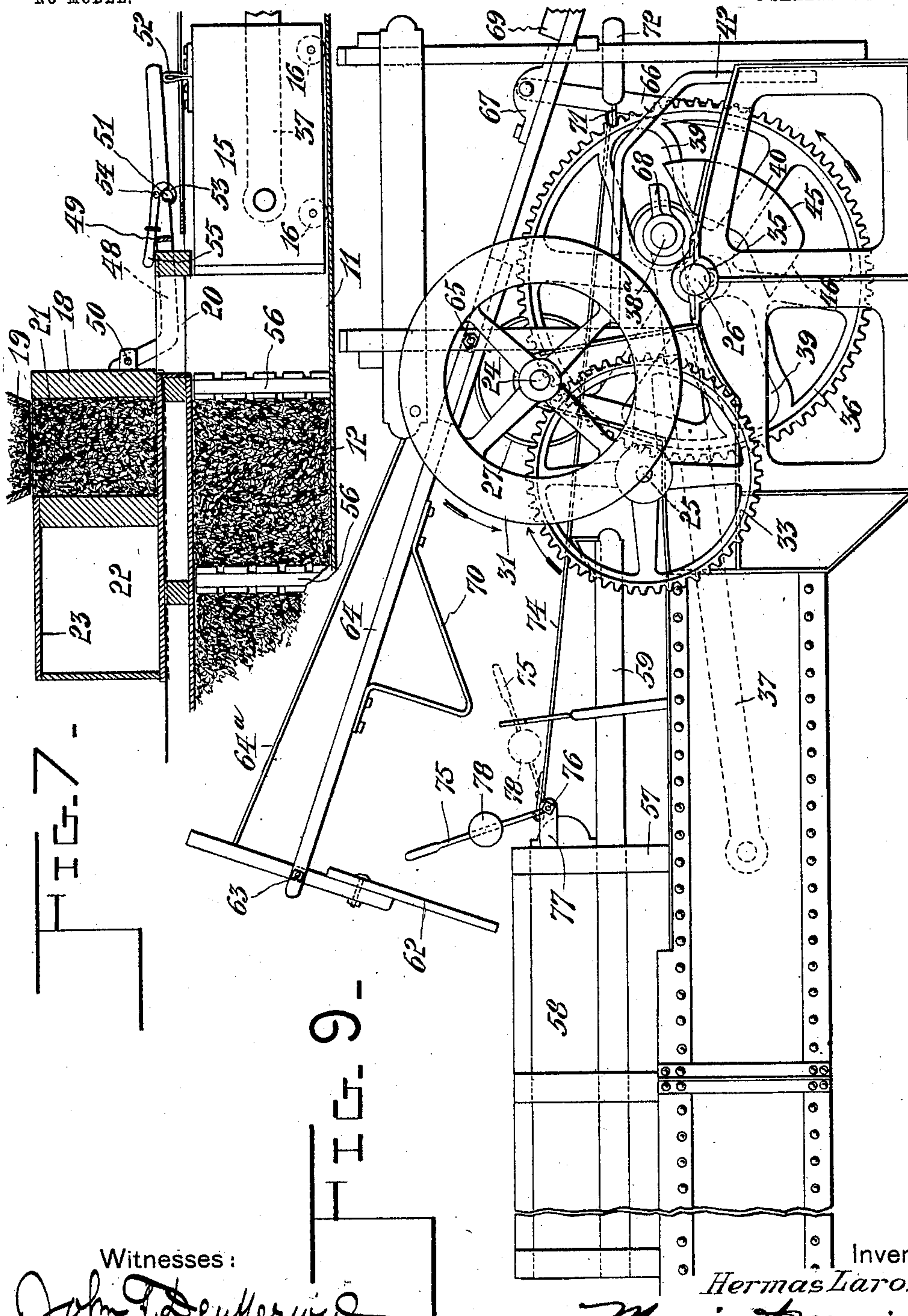
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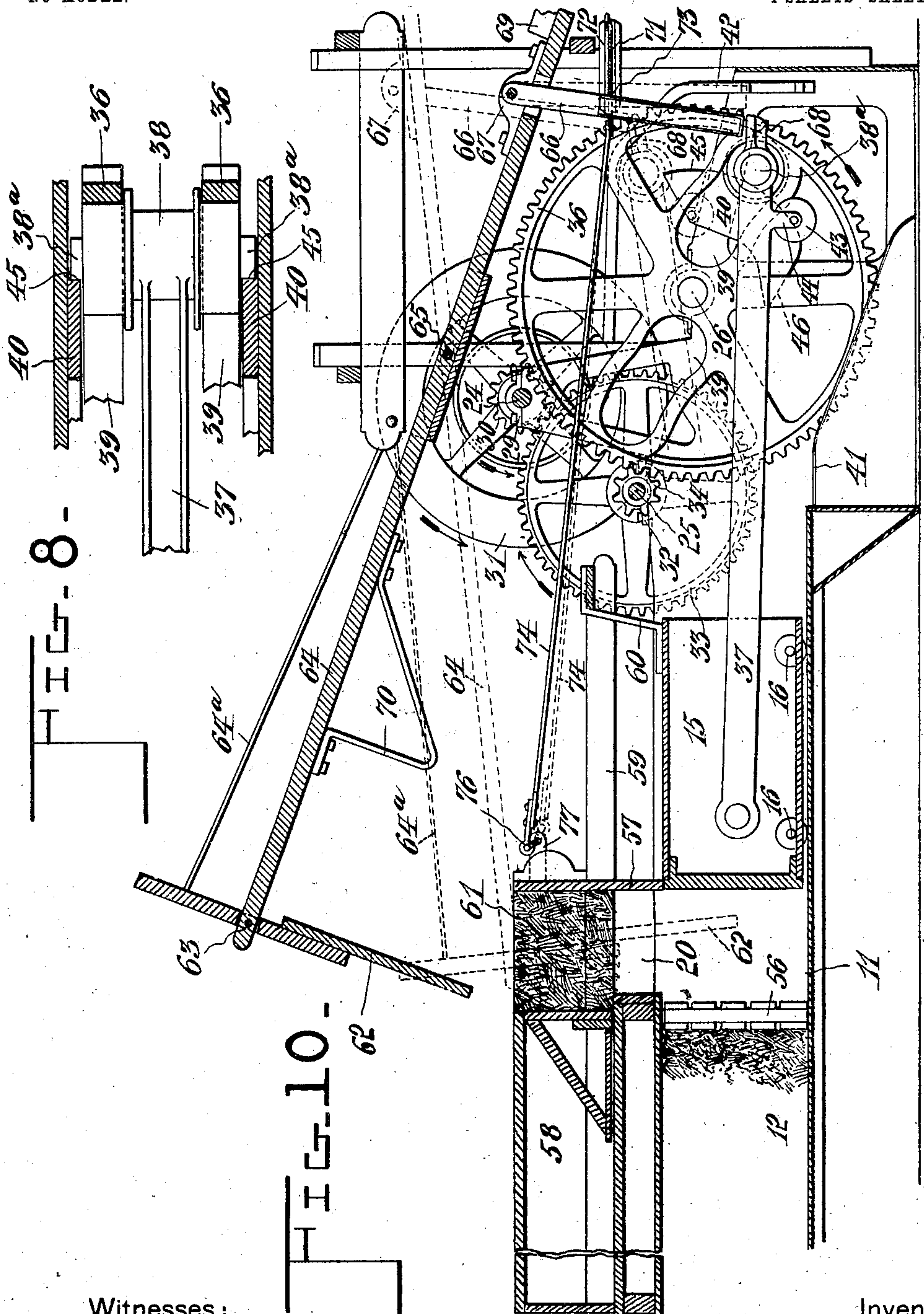
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

HERMAS LAROSE, OF VERCHERES, CANADA.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 763,005, dated June 21, 1904.

Application filed August 10, 1903. Serial No. 168,890. (No model.)

To all whom it may concern:

Be it known that I, HERMAS LAROSE, a subject of the King of Great Britain, residing at Vercheres, county of Vercheres, Province of Quebec, Canada, have invented certain new and useful Improvements in Baling-Presses; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to baling-presses adapted to press loose material of various sorts—such as hay, cotton, cornstalks, hair, shavings, chips, and the like—into bales, one of the objects to which my improved press is especially adapted being compressing wooden chips.

The object of my invention is to produce a press of the reciprocating type, which has a positive motion in both directions and combines the maximum amount of compression upon each stroke with the maximum power used in the said compression, said power being applied at those points where it is most needed.

One of the special features of my invention lies in the means whereby I provide a press, compressing the material in both directions and in different chambers, in combination with means for transferring the partially-compressed material in the state of partial compression in which it is left by the first operation from the first chamber into the second, in which the compression is completed.

My invention further consists in the construction and combination of parts, hereinafter described, and more particularly pointed out in the claims following this specification.

I have illustrated in the accompanying drawings the preferred form of my invention as applied to the compression of chips and also a modified form particularly adapted for use for compressing loose bulky material, such as hay, and herein—

Figure 1 is a plan view of the first form of my improved press. Fig. 2 is a side elevation of the waist portion thereof. Fig. 3 is a longitudinal central section through the same. Fig. 4 is a transverse sectional elevation taken

on the line 4 4 of Fig. 3. Fig. 5 is a fragmentary longitudinal section similar to Fig. 3, but showing parts in a different position. Fig. 6 is a fragmentary cross-section through the sliding charger of the apparatus, taken on the line 6 6 of Fig. 5. Fig. 7 is a longitudinal central section through the apparatus similar to Fig. 5, but showing parts in a different position. Fig. 8 is a fragmentary plan section taken on the line 8 8 of Fig. 3. Fig. 9 is a side elevation of the above-mentioned modified form of the invention adapted for the compression of hay. Fig. 10 is a longitudinal section through the same machine.

The same numerals of reference denote like parts in all the figures of the drawings.

Referring first to the form of the machine shown in Figs. 1 to 8, inclusive, 11 designates a longitudinal chamber of any ordinary or approved pattern, having sides 12 open in the rear portion, as shown at 13, and provided with slats 14 to confine the material under compression, as in the usual press of this type. In this chamber reciprocates the plunger or trunk 15, which has antifriction-rollers 16, pivotally mounted at its lowest side and upon which it rolls along the floor of the chamber 11. At 17 are shown any suitable spring-catch devices for preventing material being compressed from backward movement. Above the chamber 11 is located a sliding charger 18, and above this is fixed a stationary hopper 19, of the form shown and into which the material to be compressed is fed during the compressing operation. The mouth of this hopper 19 is not directly over the charging-opening 20 of the compression-chamber 11, but at one side thereof, and the reciprocating charger 18 has a tubular receptacle 21, which is of the same sectional area as the opening 20 and the mouth of the hopper, and this is arranged to reciprocate between the mouth of the hopper and the said charging-opening 20. The charger 18 has also an extension 22, provided with a guard-plate 23, covering the mouth of the hopper at all times when the receptacle 21 is not beneath it.

At the front end, on the right-hand of the figures of the drawings, is shown the mechanism for operating the plunger, which con-

sists of a train of gearing mounted on the main axle 24 and the two secondary axles 25 and 26. The main axle at 24 has fixed thereto a driving-pulley 27, which is adapted to be
 5 operated from any suitable source of power by means of a belt 28, and it is journaled in pillow-blocks 29 at each side of the framework of the machine. On the outer side of each pillow-block is carried a small gear-pin-
 10 ion 30, and outside of this on each end of the axle are mounted two heavy fly-wheels 31. The secondary axle 25 is sustained on pillow-blocks 32, formed on a framework near each end of the axle, and it carries on each end
 15 thereof outside of the pillow-blocks a large gear-wheel 33, the two gear-wheels 33 being arranged to mesh with the two pinions 30 on the main axle 24, and within the two pillow-blocks 32 are mounted two small gear-pin-
 20 ions 34. The tertiary axle 26 is likewise mounted in pillow-blocks 35 on the framework and carries within these pillow-blocks a pair of large gear-wheels 36, which mesh with and are driven by the pinions 34. As this
 25 axle sustains the direct pressure of the plunger 15 in the compression process, it is made larger and stronger and more solidly fixed than any of the others, as indicated in Fig. 1. With the two gear-wheels 36 is operatively
 30 engaged the plunger-rod 37, which has at its forward end a cross-head 38, this consisting of a solidly-fixed pin extending on each side into one of the pair of oppositely-disposed slots 39, which are formed at an angle some-
 35 what oblique to the radius of the wheels 36 by the peculiar shape of some of the spokes thereof. Only one slot of each pair is used at a time, and the other slot is idle, the only purpose of this being to prolong the life of the
 40 wheel by utilizing the other slot when the first slot is worn out. It will be seen from the mode of connection described that the plunger-rod 37 has a certain amount of loose or free motion relatively to the wheel 36; but
 45 the cross-head 38 of the plunger-rod is further guided by a pair of cam-blocks 40, which are of the shape shown best in Fig. 3 and on the lower forward side of the wheel. These blocks 40 are engaged by the projecting ends
 50 38^a of the cross-head, which extends beyond the planes of the wheels 36. The motion of the cross-head and the plunger-rod carrying it is further limited by two cam-bars, (designated, respectively, 41 and 42,) the action of
 55 which will be presently described. Coacting with the first pair of cam-bars 41 is a cam-roller 43, which is carried by a pair of offsets 44 on the lower side of the plunger-rod 37. Supposing the plunger is at the beginning of
 60 its forward stroke—that is to say, in the position shown in Fig. 3—the cross-head is at the outer end of the slots 39, being kept in this position by the engagement of the ends
 65 38^a thereof with the circular concentric surface 45 of the cam-blocks 40. As soon, how-

ever, as the ends 38^a pass beyond the upper point of these circular surfaces they are released, and the cross-head strikes the cam-bar 42, which throws it gradually inward toward the inner ends of the slots 39—that is to say,
 70 close to the center of the wheel. During this time the compression of the material is slight, and the compressive force needed to advance the plunger is correspondingly slight, so that the slight power employed by reason of the
 75 interaction of the cam-bar 42 and the slots 39 is sufficient to advance the plunger to such an extent. When, however, this is accomplished, the compression has proceeded so far that more force is needed to more completely com-
 80 press the material and enable the plunger to finish its stroke, and therefore the cross-head is retained at the inner or hub ends of the slots 39 by the cam-bar 42 until after the slot has passed the vertical position, when the re-
 85 action of the compressed material retains it in this position through an angle of about one hundred and eighty degrees. As the rotation proceeds and the plunger is drawn back the ends 38^a of the cross-head now strike the ob-
 90 lique cam-surfaces 46 of the blocks 40, and this forces the cross-head again to the outer or circumferential ends of the slots 39 until the roller 43 strikes against the cam-bar 41, which causes the said motion to be a gradual
 95 one and prevents the sudden jar of the cross-head upon the ends of the slots 39.

By the above description it will be seen that the greatest power during the revolution is applied during the greatest compression of
 100 the material and that the advancement of the plunger during the period of easy compression takes place rapidly.

I will now describe the mode of operation of the charger 18, which is reciprocated di-
 105 rect from the plunger 15 and has a disengaging device to enable it to be thrown out of service temporarily whenever desired. The charger 18 has connected thereto a bent link-frame 47, which has an H form comprised of
 110 two longitudinal bars 48, connected by a cross-bar 49, and the ends of the bars 48 are pivotally connected, as at 50, to the charger. The bars 47 have formed therein to the right of the cross-bar 49 semicircular notches 51, which
 115 are adapted to be engaged by an upstanding lug or strap 52, fixed to the upper side of the plunger, as shown. In Figs. 3 and 5, in which these lugs are engaged with the notches on the bars 47, it will be seen that the charger
 120 18 partakes of the motion of the plunger and reciprocates synchronously therewith, and in this case the material is fed into the hopper 19, and at each backward stroke of the piston a portion thereof is carried by means of the
 125 receptacle 21 and dropped through the opening 20 into the compression-chamber. In some cases, however, when it is desired to throw the feeding apparatus temporarily out of use I make use of a disengaging piece 53, 130

which is in the shape of a hooked rod pivoted at 54 and having a handle 55, by which it may be thrown over into the position shown in Fig. 7. In this case the hooked end of the bar 53 covers the notches 51 and prevents the lug 52 from engaging therewith. This arrangement is very desirable in cases where foreign material falls into the compression-chamber or where, for instance, a bale-separator 56 becomes lodged crosswise in the compression-chamber or the mouth of the latter becomes stopped up and it is desirable to obtain access to the mouth of the compression-chamber without stopping the whole machine. In some cases also it may be desirable to feed the chips directly into the mouth 20 of the compression-chamber without the intermediary of the reciprocating charger.

In Figs. 9 and 10 is shown a somewhat different form of machine which has a double compressive function and is especially adapted for loose springy material, as above stated. The compression-chamber 11, the plunger 15, plunger-rod 37, and all the parts generally connected therewith are precisely as in Fig. 3, with the exception of the hopper and reciprocating charger, which are dispensed with and replaced by other devices, and also with the exception of certain appurtenances connected therewith, which will be described. At the right-hand side of the mouth of the compression-chamber there is a stationary plate 57, which extends upwardly a considerable distance and forms a stationary abutment for the primary compression of the material, which is effected by means of a reciprocating box-like structure 58, which is connected at the sides to the plunger 15 by means of strips 59 and a securing-post 60. The mode of operation of this arrangement will be made evident, as it will be seen that the reciprocating member 58 by alternately retreating from and approaching to the abutment 57 forms a box or hopper of variable size, which is practically a primary compression-chamber, the hay being fed into it while the plunger is at the forward or left-hand end of its stroke and being compressed on its return motion. When the plunger and reciprocating member 58 have contemporaneously reached the right-hand end of the stroke, the partially-compressed material 61 is thrust down through the opening 20 by means of a pusher-board 62, which is pivotally mounted, as at 63, upon the end of a long lever-arm 64, pivoted at 65 upon the frame of the machine. This lever-arm 64 is oscillated about its axis at the proper time to thrust the pusher 62 down into the position shown in dotted lines in Fig. 10 by means of a trip-bar 66, which is pivoted to a pair of bearing-irons 67, carried by the lever-arm, as shown, and whose lower end projects into a position to be engaged by a lug 68, projecting beyond the cross-head on the plunger-rod 37, which acts to push the trip-rod upwardly,

and thus thrust the pusher 62 downwardly. The pusher-board 62 is held in vertical position during its downward movement by a bridle-bar 64^a, connecting the upper end of the pusher above the pivot 63 with a projecting portion of the frame. Ordinarily the lever-arm is held in raised position by a counterbalance-weight 69, mounted on the rear end of the lever-arm 64. After the material has been thrust down into the compression-chamber by means of the pusher, it will ordinarily return to its normal position, as shown in full lines by the said counterbalance; but as it may on some occasions become stuck in the material thrust into the compression-chamber positive means is provided for raising it, so as to prevent it from becoming caught between the plunger 15 and the wall of the opening 20 and so breaking or deranging the apparatus. This means comprises a triangular projecting cam-bar 70, which is fixed to the lower side of the rod 64 in position to be engaged by the upstanding connecting-iron 60 on the plunger, and thus it is pushed out of the plunger-chamber sufficiently to become disengaged and resume its normal position. As in some cases it may be desirable to throw the pusher temporarily out of action in order to permit inspection or other work about the press, I have further provided a disengaging device comprising a plate 71, which is reciprocally mounted in guides 72 at the forward end of the frame and has a hole 73, through which the bar 66 passes, and this plate 71 is connected by a link-rod 74 with a stationary abutment 57, or rather with a hand-lever 75, pivoted at its ends upon a bolt 76, set in a pair of projecting lugs 77, fixed to the said abutment 57. The hand-lever 75 may be provided with a weight 78, so as to hold it in the position in which it is fixed; but it is adapted to be thrown into either of the two positions shown, respectively in full and dotted lines in Fig. 9. In the full-line position it will be seen that the plate 71 is drawn back, so as to throw the trip-rod 66 into position to be engaged by the lug 68—that is to say, into operative position for the pusher 62—but when the handle 75 is thrown over into the position shown in dotted lines the pusher 66 is turned, so as to be no longer engaged by the lug 68, as shown by the dotted lines in Fig. 10.

It will be seen from the last-mentioned form that a press is provided having a double compression, this taking place on both forward and backward strokes of the plunger, and for this style of press the cam-blocks 40 are particularly necessary to assist in overcoming the compressive force exerted by the hay or other material 61 on the return stroke of the plunger.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit my-

self to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

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

1. A baling-press comprising a compression-chamber, a plunger reciprocating therein, a cross-head formed on the free end of said plunger, a wheel having an oblique slot therein in which said cross-head is guided, and cam-pieces arranged to push said cross-head from one end to the other in said slot so as to guide the cross-head to the outer circumferential portion of the slot during the early stage of compression and toward the inner or hub portion during the later stage of compression.

2. A baling-press comprising a compression-chamber, having a feed-opening at its rear end, a plunger reciprocating therein, a feed-hopper mounted above said compression-chamber and slightly at one side of said feed-opening, a reciprocating charger connected with said plunger and reciprocating therewith, said charger having a bottomless receptacle adapted at one end of its stroke to form a continuation of the hopper and receive a charge therefrom and at the other end of its stroke to drop said charge into the compression-chamber through said feed-opening, and a disconnecting device for throwing said charger temporarily out of connection with the said plunger.

3. A baling-press comprising a compression-chamber having a feed-opening at its rear end, a plunger reciprocating in said compression-chamber, a gear-wheel mounted on a transverse axle and having an oblique slot, a plunger-rod connected with said plunger, a cross-head on the opposite end of said plunger-rod and traveling in said slot, cam-pieces adapted to strike on said cross-head and to throw it inwardly toward the center of the wheel during the first half of the advance stroke and outwardly from the center of the wheel during the latter half of the return stroke, operative gearing connecting said gear-wheel with a source of power, a feed-hopper mounted above said compression-chamber and at one side of said feed-opening, and a reciprocating charger connected to and partaking the motion of said plunger, and having a receptacle therein reciprocating between the mouth of said hopper and said charging-opening of the compression-chamber.

4. A baling-press comprising a compression-chamber having a feed-opening at its rear end, a plunger reciprocating in said compression-chamber, a gear-wheel mounted on a transverse axle and having an oblique slot, a plunger-rod connected with said plunger, a cross-head on the opposite end of said plunger-rod and traveling in said slot, cam-pieces adapted to strike on said cross-head and throw it inwardly toward the center of the wheel during the first half of the advance stroke and outwardly from the center of the wheel during the latter half of the return stroke, operative gearing connecting said gear-wheel with a source of power, a feed-hopper mounted above said compression-chamber and at one side of said feed-opening, a reciprocating charger connected to and partaking the motion of said plunger and having a receptacle therein reciprocating between the mouth of said hopper and said charging-opening of the compression-chamber, a link-frame pivotally connected to said charger and having notches therein, a lug on said plunger adapted to engage said notches and form a connection between the plunger and the charger, and a disengaging device comprising a hooked rod adapted to be thrown over by a handle to disengage said lug from said notches substantially as described.

5. A baling-press comprising a compression-chamber having a charging-opening, a plunger reciprocating therein, a wheel rotatively mounted at the rear of said plunger, a plunger-rod operatively connecting said plunger to said wheel and having a trip-lug thereon, a lever-arm pivotally mounted at an intermediate point, a pusher-board carried at one end of said lever-arm, a trip-rod carried by the other end of said lever-arm and adapted to be engaged by said trip-lug, a reciprocating member mounted above said charging-opening and connected with said plunger and reciprocating therewith, and an abutment at the opposite side of said charging-opening against which said reciprocating member partially compresses the material, a projecting piece on said plunger, and a cam-bar mounted on the lower side of said lever-arm and adapted to be struck by said projecting piece, whereby to raise said pusher-board from the compression-chamber before the advance movement of the plunger therein, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

HERMAS LAROSE.

Witnesses:

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L. N. HANDFIELD.