(No Model.)

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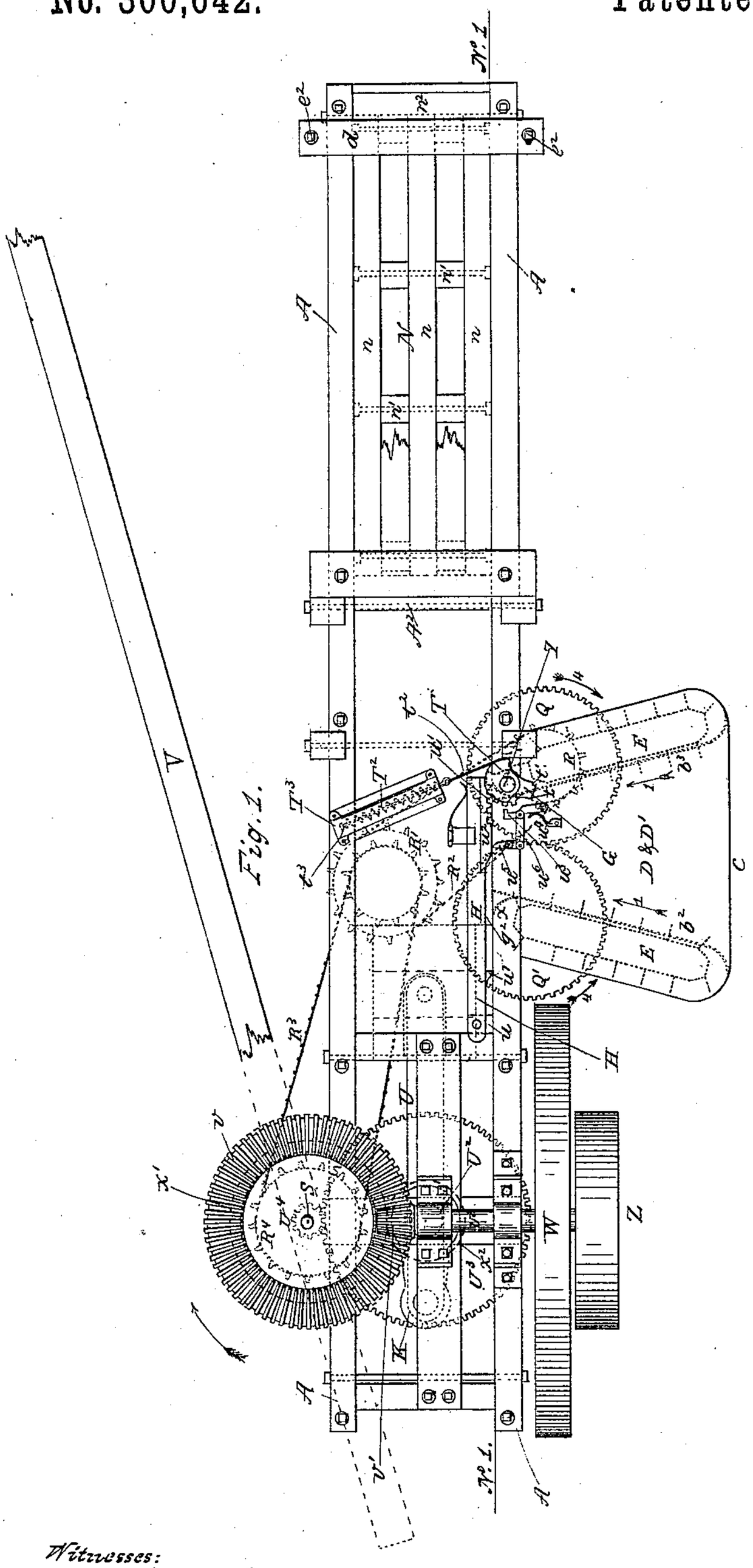
A. S. ROBINSON.

BALING PRESS.

No. 300,642. Patented June 17, 1884.



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6 Sheets—Sheet 2.

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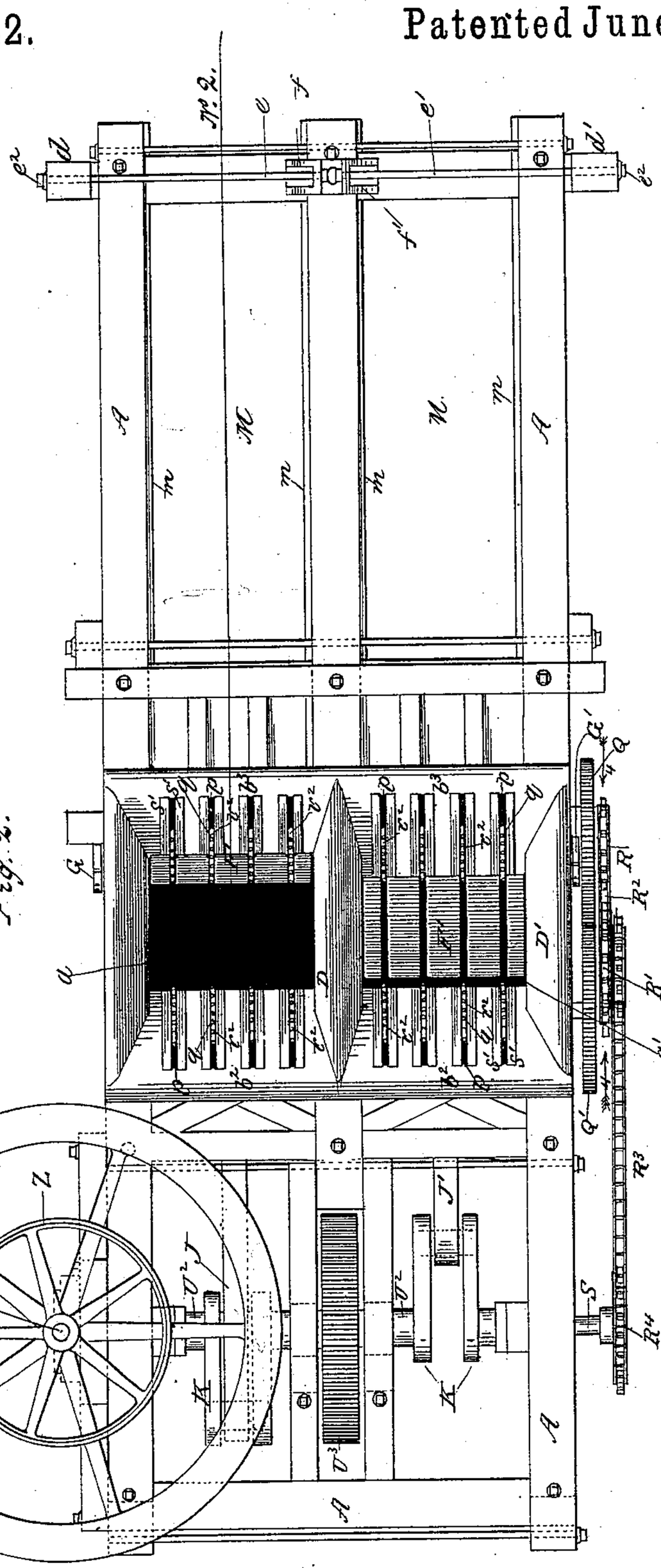

Fig. 2.

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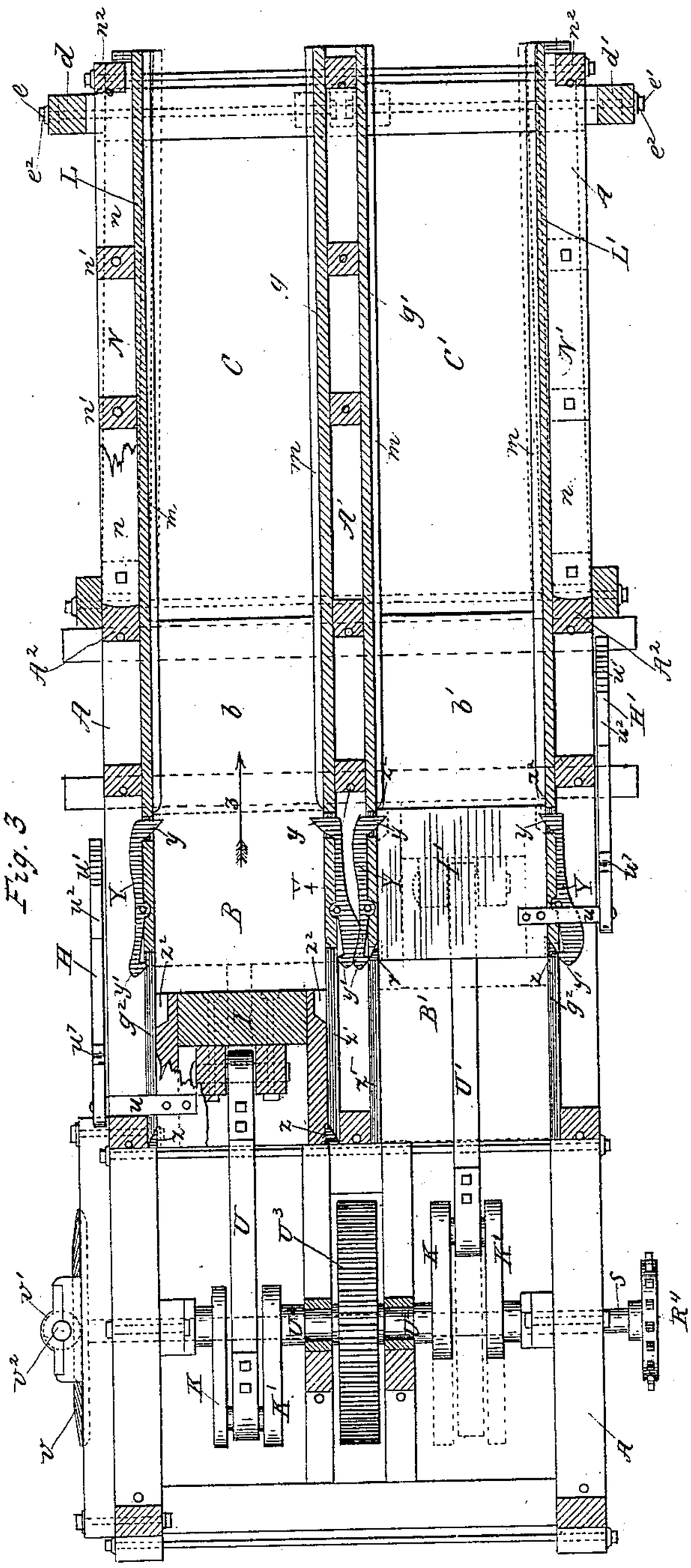

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Fig. 4.

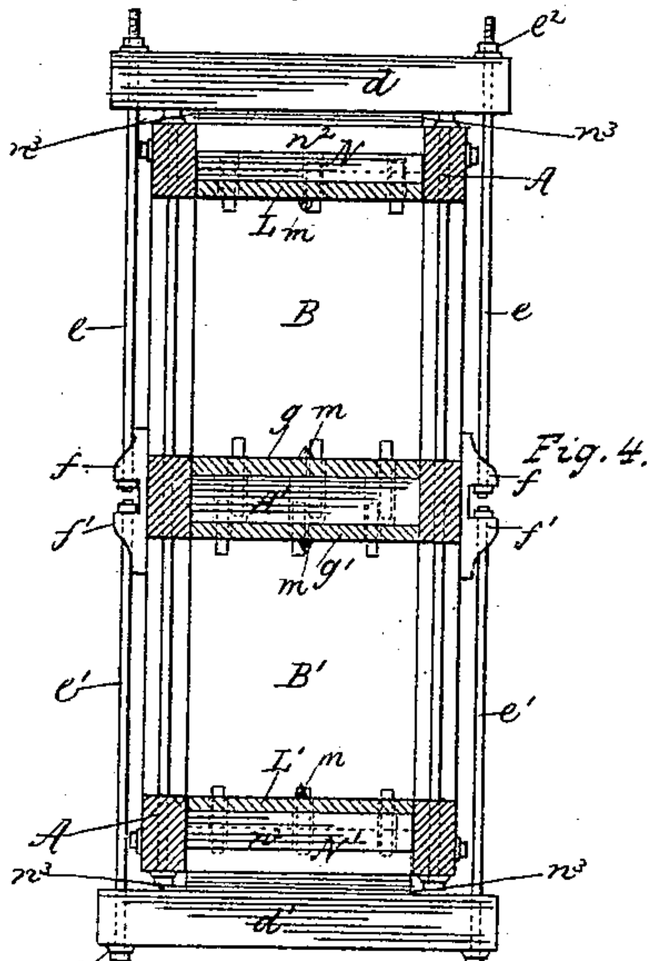

Fig. 12.

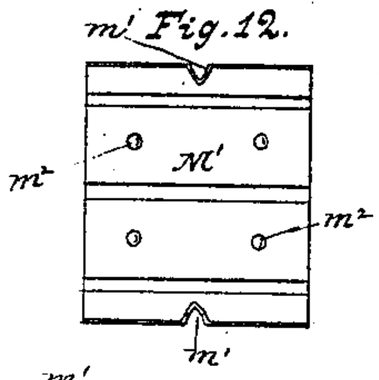

Fig. 13

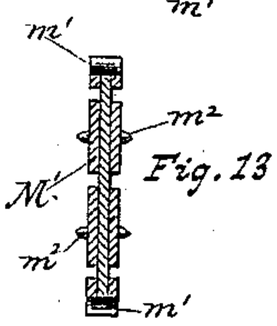

Fig. 5.

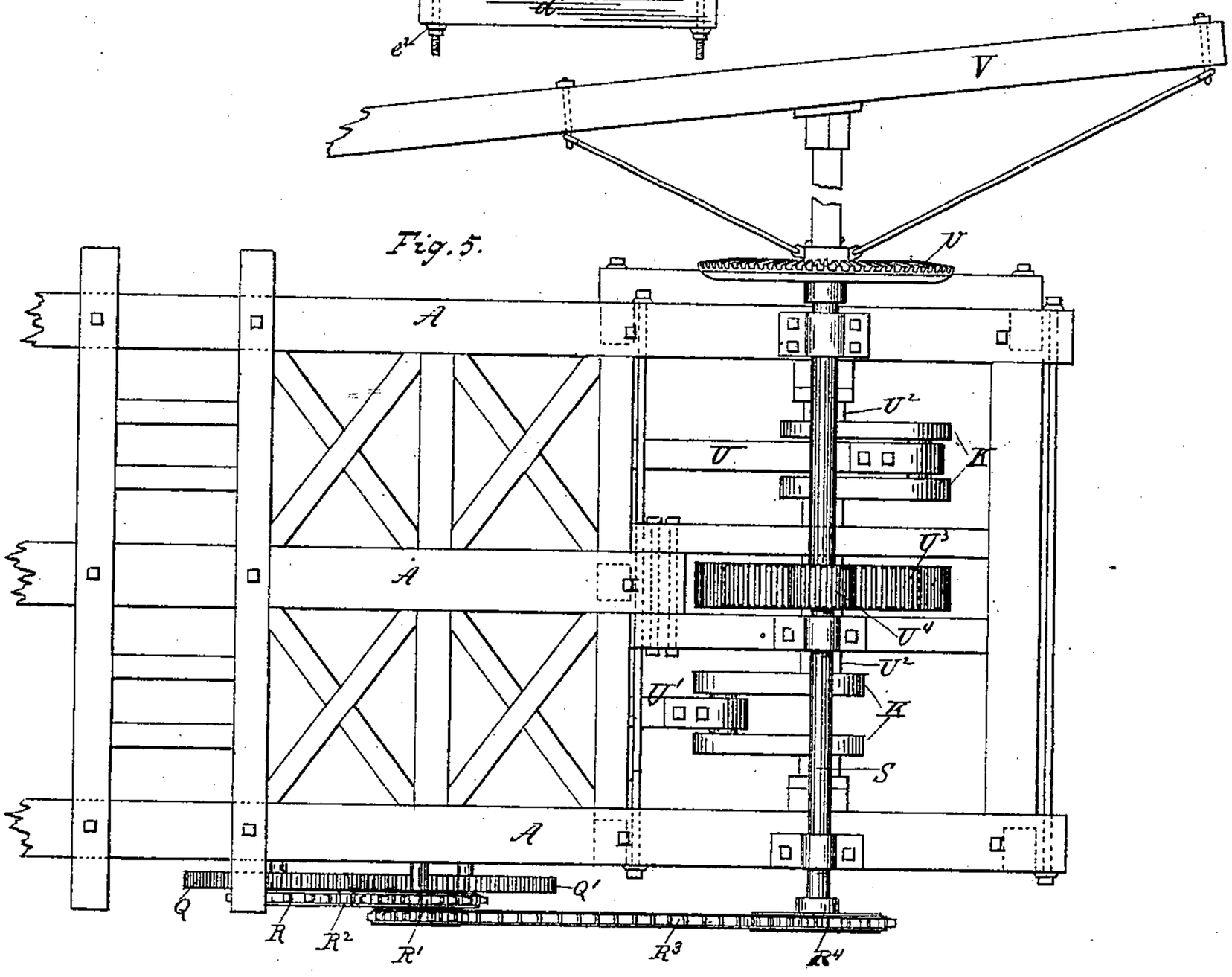

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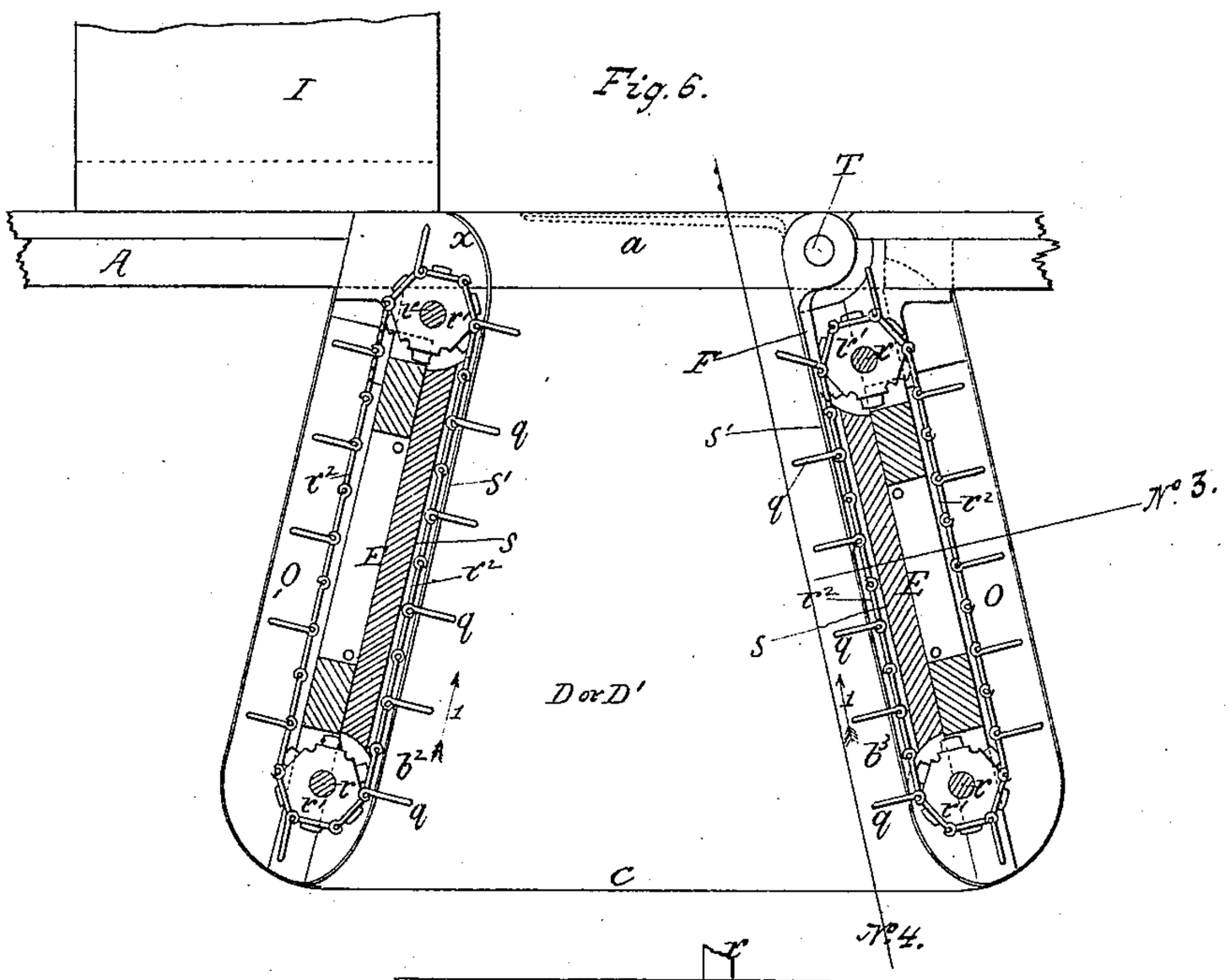
Fig. 6.



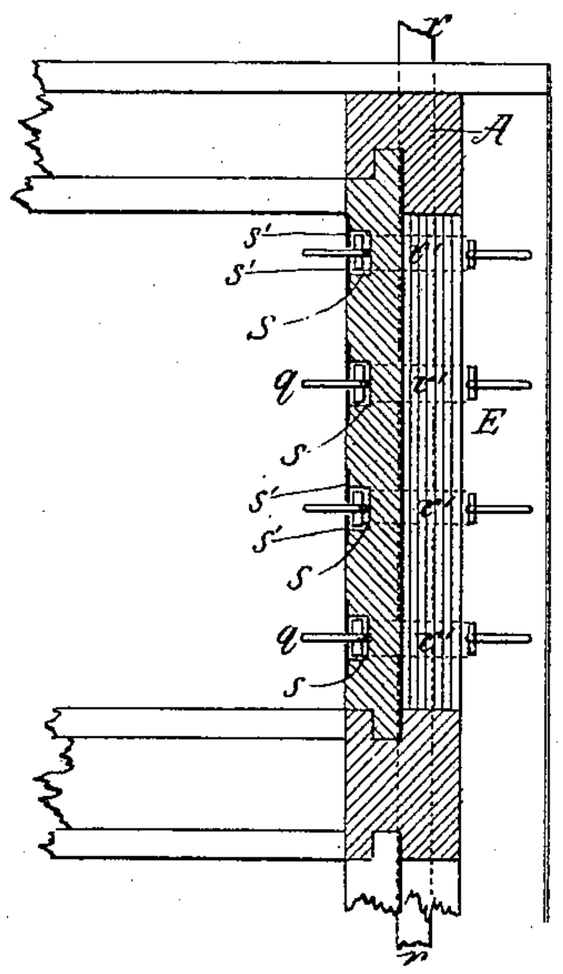


Fig. 7.

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(No Model.) 6 Sheets—Sheet 6.

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BALING PRESS.

No. 300,642. Patented June 17, 1884.

Fig. 8

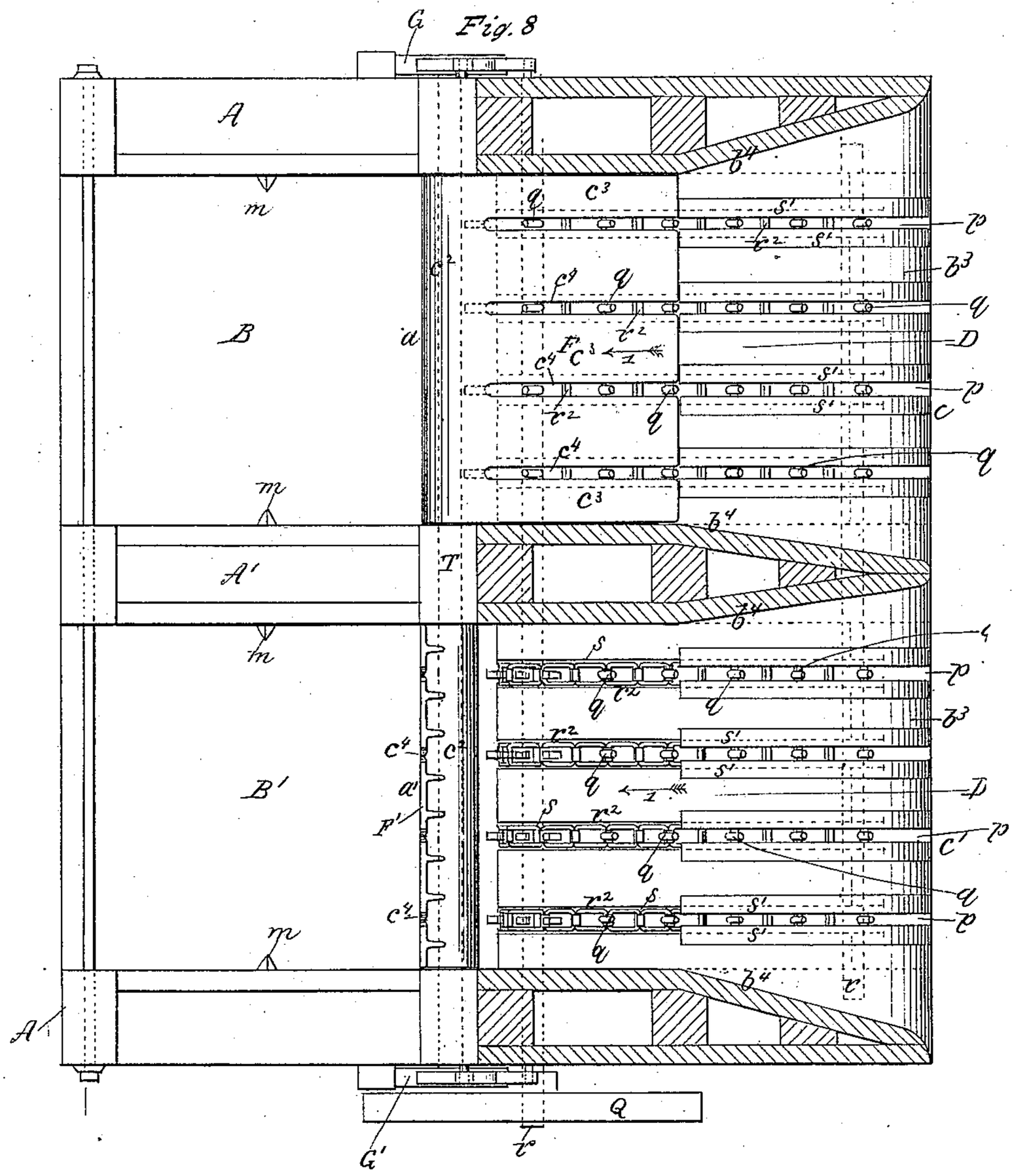


Fig. 9.

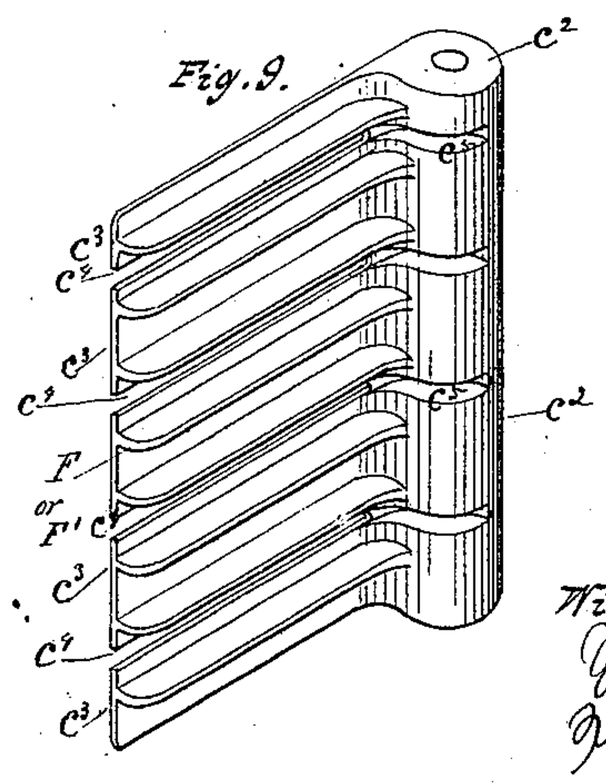


Fig. 11.

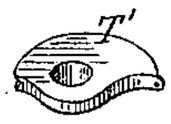
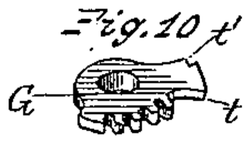


Fig. 10



Witnesses:
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UNITED STATES PATENT OFFICE.

ALBERT S. ROBINSON, OF ALBANY, NEW YORK, ASSIGNOR OF ONE-HALF TO ABRAHAM SCHELL, OF SAME PLACE.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 300,642, dated June 17, 1884.

Application filed September 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT S. ROBINSON, a citizen of the United States, and residing in the city and county of Albany, and State of New York, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification.

My invention relates to a duplex baling-press having mechanism for operating the duplicated parts of the same, devices for exerting pressure on the formed bales, feeding-chambers, automatically-feeding mechanisms, automatically-operating gates for opening and closing communication between the feeding-chambers and their respective platen-chambers, automatically-operating dogs for holding sections of material thrust into the pressing-chamber from moving back, and mechanism for equalizing the movement of the sweep-lever and for preventing a rebound of the same when the platens commence their return toward the front ends of their respective platen-chambers.

The objects of my improvements are to provide means for increasing or diminishing the friction of moving in the platen-chamber, and for automatically feeding the material to be baled into the respective platen-chambers of the press in the form of sections, which will be gradually compacted in their passage from the feeding-chamber to the platen-chamber and be closed therein by the automatic action of mechanism, so that the operator will be only required to introduce the material alternately within the flaring and conveniently spreading open ends of the feed-chambers; and, also, to provide means by which the introduced sections of the material, as they are thrust into the pressing-chamber, will be held in place for moving backward; and, also, to provide mechanism by which a rebound of the sweep-lever will be prevented at the times of the end of forward thrust of the platens, so that all liability of accident to the animal will be obviated and the power of the driving mechanism of the press will be equalized. I accomplish these objects by means of the mechanism illustrated in the accompanying drawings, in which there are thirteen figures illustrating my invention, in all of which the same designation of parts by letter-reference is used.

Referring to the drawings, Figure 1 is a view of my improved press from above. Fig. 2 is a side elevation of the same view from the feeding side thereof. Fig. 3 is a longitudinal sectional elevation taken at line No. 1 in Fig. 1. Fig. 4 is a view of the rear end of the press. Fig. 5 is a rear side elevation of the gear mechanism of the press. Fig. 6 is a horizontal sectional view of the feed-chamber, feed mechanism, and gate on an enlarged scale, and taken at line No. 2, Fig. 2. Fig. 7 is a transverse sectional elevation taken at line No. 3, Fig. 6. Fig. 8 is a view of the inclined side b^2 of the feeding-chamber and its operating mechanism, taken at line No. 4, Fig. 6. Fig. 9 is a perspective view of the closing-gate. Fig. 10 is a perspective view of the quadrant-pinion. Fig. 11 is a perspective view of the quadrant-pulley. Fig. 12 is a plan view of partition-board, and Fig. 13 is a sectional elevation of the same.

In the drawings, A A represent the frame of the body of the hay-press, which press is duplex in its character in respect to the respective chambers, platens, and mechanism for operating the adjunctive moving parts of the same by a single system of driving-gear mechanism. These duplex parts may be arranged horizontally and neighboring side by side, though I prefer to arrange them vertically, neighboring, and one over the other, as shown. These duplicated parts in my improved press are the platen-chambers B and B′; feed-openings *a* and *a′*, connecting each to its respective platen-chamber from the same and one side of the press; pressing-chambers *b* and *b′*, commencing at the rear end-throw of the platens and extending rearward to the forward end of the baling-chamber; the baling-chambers C C′, extending rearward from the pressing-chambers to the rear end of the body of the press; the feeding-chambers D D′, connecting, respectively, with the platen-chambers B B′ through their respective feed-openings *a a′*; feeding mechanism E E′, moving in direction from the outer end openings, *c c′*, of the feeding-chambers toward feed-openings *a a′*; feed-chamber-clearing gates F and F′; quadrant-pinions G and G′; racks H H′ for operating said gates; platens I and I′; pitmen J and J′; crank-arms K and K′ for operating the plat-

ens from the gear-operating mechanism of the press; friction-lining L L′ of baling-chambers C C′; depressing-bars *d d′* and their draw-bolts *e e′* and brackets *f f′* for adjusting said friction-linings in relation to the permanent opposite side lining of said baling-chambers.

As a description of one of each of the above-named duplicate parts will suffice for that of the other parts, I will describe only those parts and elements shown in the upper half or horizontal portions of the press in the drawings.

The frame-work of the press is made to include the operating-gear mechanism, the platen-chambers, press-chambers, and baling-chambers. This frame is so made as to inclose between its side portions a horizontal middle partition, A′, formed by cross-bars framed with the middle horizontal plates of the frame and bottom lining, *g*, of the upper series of chambers, and top linings, *g′*, of the lower series of similar chambers. This partition completely separates the two series of chambers. In one of the side linings or walls of platen-chamber B is made feed-opening *a*, which has a vertical extension equal to the vertical distance the upper and lower linings of said chambers are apart, and with a horizontal extension a few inches shorter than the length of the movement of platen I in said chamber. Pressing-chamber *b* is made with closed sides, and top and bottom linings or walls, in which each one of each two of its oppositely-located walls is parallel with the other.

The lower wall or floor-lining, *g*, of baling-chamber C is arranged on the same horizontal plane with the floors of the platen and pressing chambers, and is fixed in position, and the two oppositely-located sides of each of these baling-chambers are made open from the horizontal plane of their respective friction-linings L L′ to the horizontal plane of the bearing-surfaces of linings *g* and *g′*, respectively, as shown in Figs. 2, 3, 4, and 8. These openings M extend in a horizontal direction from the rear end of pressing-chambers *b b′* to the rear of the press, and said linings L L′ and *g g′* of these baling-chambers are free from projecting marginal boundary-ledges or guiding-strips.

Secured to linings L L′ and *g g′* at about central in the width of their bearing-surfaces are longitudinal ways *m m*. These ways are preferably made of metal, and with a V-shaped form in their cross-area, though they may be made half-round or oval or rectangular in form of cross direction; and, if preferred, they may be made of hard wood. These ways in each baling-chamber are in situation opposite each other—one above and one below—as shown in Figs. 4 and 8, and they extend from the rear end of baling-chamber to near the forward end of pressing-chambers *b b′*, as shown in Fig. 3. M′ is the partition-board, made in the usual manner, and provided with tying-off slots, as heretofore made. The opposite ends or edges (above and below) are each provided with grooves *m′*, corresponding in form, size, and situation with the form, size, and situation of ways *m*, secured to the linings of the baling-chamber, so that said grooves will engage with said ways and be held therewith and guided in its progressionally-rearward movement toward the discharge ends of the baling-chambers. Each face side of said partition-boards is provided with two or more spurs, which project to a short distance outward from the plane of the face surface of the board. The spurs engage with the end of the bale. The board is set against and held with the bale as it and the board are being progressively moved rearward, so that the bale is steadied and held from twisting. At the same time the ways *m m* will themselves be made to hold with longitudinal grooves, which will be gradually formed in the sides of the bale by said ways as the material is being forced into the pressing-chamber. By thus making the two oppositely-located sides M of the baling-chamber to consist of a single opening extending from lining to lining, the bale may be tied off nearer its longitudinal corners, and any number of ties may be applied to the bale in a convenient manner, the partition-board being provided with tying-off slots to correspond.

The upper wall of lining L of baling-chamber C is made of planking-boards, which are continuous with the upper lining or walls of the platens and press-chambers. These planking-boards are held to the upper cross-timbers, A^2, of the frame by bolts or screws, as shown in Figs. 1 and 3. The portion of these planking-boards which extends rearward of pressing-chamber *b* and from the upper side lining of the baling-chamber is free to be deflected in a vertical direction from a true plane line.

Placed loosely on the upper side of the friction-lining board L of bale-chamber C, and between the upper longitudinal plates of the frame, is the stiffening-rack N, formed of bars *n* and tie-pieces *n′*, which are held together by bolts. This rack is made with a length sufficient to be extended from the rear end of the lining of pressing-chamber *b* to the rear end of the baling-chamber. This stiffening-rack, resting on the top friction-lining, L, of the baling-chamber, rises up even with the top surface of the longitudinal top plates of the frame, and extends from side to side between said top plates, as shown. Secured to the rear end of this stiffening-rack is cross-bar n^2. Arranged across the rear end portion of this stiffening-rack N is depressing-bar *d*, which is made with notches in its end portions, as at n^3, from its lower side, so as to readily receive the lower side portions of the bar between the shoulders of these notches between the top plates, as shown in Fig. 4. The outer projecting ends of this depressing-bar are pierced and receive screw-threaded draw-bolts *e e*, which bolts are each provided at one end with a head and the other end with a screw-nut, e^2 e^2. These draw-bolts also pass

through brackets *f f*, secured to the sides of the frame on a vertical line with the holes made in depressing-bar *d*, and when the screw-nut is tightened on the draw-bolts they will draw on depressing-bar *d*, and force the rear end of stiffening-rack N and the top lining, L, downward, so that it will be deflected from a true parallel line with the floor or bottom lining, *g*, and cause the vertical extension of the rear end of baling-chamber C to be a little less than the vertical extension forward end of the same chamber. A slacking of the nuts will relieve this depressing-bar and permit the top lining of the chamber to resume its normal position. The lower series of chambers, B′, *b′*, and C′, are made substantially in the same manner, with this difference—the bottom lining, L′, of lower baling-chamber, C′, is made to be a friction-lining, and capable of being deflected the same as friction-lining L of the upper baling-chamber, and the stiffening-rack N′, made similar to and operating as stiffening-rack N, is placed beneath, as shown.

Secured to a side of the body of the press, and extending outward from the same from feed-opening *a* of upper platen-chamber, B, is feeding-chamber D, which feed-chamber has its two oppositely-located sides b^2 b^3 made to flare outwardly as they are extended outward from said feed-opening. The contracted end of this feed-chamber terminates at said feed-opening, and is the discharge end, while the enlarged end is open and is the receiving-mouth of the chamber. I prefer to make the transversely-located sides b^4 b^4 of this feed-chamber also flaring in part or whole, as such flare will increase the capacity of its receiving-mouth. The inner end of wall b^2 of feeding-chamber D is made to curve back in direction of the backward movement of platen I and toward the margin edge of feed-opening *a*, as at *x*. (Shown in Figs. 1 and 6.) By the above-described form of feeding-chamber the walls of the same are made to compact the material to be baled while it is being thrust forward from the receiving-mouth through this chamber, and be discharged into the platen-chamber, and each charge of hay (or other material) will be introduced into said platen-chamber in the form of a partially-compressed charge, which will form one of several sections of a bale when the same is completed, and which will be readily detachable from the other similarly-formed sections of the bale when it is broken open.

Arranged at the sides of the oppositely-located flaring sides b^2 b^3 of feeding-chamber D are inclosed feed-mechanism chambers O O′, which inclose each feed mechanism E E′. These chambers O O′ communicate with the feeding-chamber through openings or slots *p p*, made in its respective side walls, b^2 b^3, as shown in Figs. 2, 6, 7, and 8, and through slots or openings *p p* project the moving spurs *q q* of feed mechanism E E′, which engage with the charges of hay (or other material to be pressed) to carry the same from the receiving-mouth of the feed-chamber into the platen-chamber through feed-opening *a*, in the form of a partly-compressed section of a bale.

The preferred form of feeding mechanism is shown by full lines in Figs. 2, 6, 7, and 8, and dotted lines in Fig. 1, and consists of vertical shafts *r r*, passing through chambers O O′ at a short distance from the ends of said chambers, and having a series of sprocket-wheels, *r′ r′ r′ r′*, secured to each, so as to revolve with the same. Carried by said sprocket-wheels are endless chains r^2, with the links of which (at distances of about four inches, more or less, apart) are made spurs *q q*. These spurs are carried by the said chains in direction indicated by arrows 1 in Figs. 1, 6, and 8, so that the spurs, projecting the feeding-chamber from its flaring walls, will be carried toward feed-openings *a*, while, when they are returned, they will move in an opposite direction in chambers O O′. The endless chains r^2 are supported from sagging and against being crowded back by recessed ways *s*, in which the links move, and the edges of slots *p p*, in which spurs *q q* move, are preserved from wear by metal strips *s′*, all as shown in Figs. 2, 6, 7, and 8. The sprocket-wheel shaft *r* in feed mechanism chamber O, nearest to platen-chamber B, is set as near to said chamber as possible to have spurs *q* clear the sides of the platen neighboring the ends of the spurs as they turn back with the sprocket-wheel off from feed-chamber *a*. The portion *x* of flaring wall b^2 of the feed-chamber is made with such a curve that the recessed ways *s s* and slots *p p* will be made to gradually extend beyond spurs *q q*, as the latter turn back at curve *x*.

Secured to the lower ends of vertical sprocket-wheel shafts *r r*, nearest to the body of the press, are gear-wheels Q Q′, made each with an equal diameter as the other, and working each with the other to revolve said shafts in opposite directions, and carry the series of spurs in direction of arrow 1, as indicated in Figs. 2 and 6. Secured to one of the same shafts, *r*, so as to revolve with the same, is a sprocket-wheel, R, which sprocket-wheel is actuated by sprocket-wheel R′ and endless chain R^2, and this second sprocket-wheel R′ is actuated by endless chain R^3 and sprocket-wheel R^4, secured to the vertical driving-shaft S.

Supported in vertical bearings in longitudinal plates A A of the frame, and at near the rear edge of feed-opening *a*, is vertical shaft T, to which is rigidly secured gate F.

Secured to the upper end of gate-shaft T is quadrant-pinion G, which has made with it tripping projection *t* and catching-notch *t′*. This quadrant-pinion is so set in relation to gate F that when the former is folded back into flaring side wall b^3 of feed-chamber D the first cogs of the series in pinion G will be made to project off over the top of the press-body, as shown in Fig. 1, when tripping projection *t* and notch *t′* will be relatively on a

vertical line with gate F. Being thus arranged in relation to gate F, pinion G will, through shaft T, turn said gate from position against side b^3 of the feed-chamber to position parallel with the line of movement of platen I and close feed-opening *a*, as shown and indicated in Fig. 6.

Pivoted to bracket *u*, secured to platen I, is rack-bar H, Figs. 1 and 3. To the free end of said rack-bar is secured rack *u'*, having cogs corresponding with cogs of quadrant-pinion G, with which said rack is to engage. Immediately rearward of the series of cogs in *u'* is check u^2, against which projection *t* will strike when pinion G is turned up by the pushing force of rack-bar H, when the latter is thrust forward. Pivoted to the upper side of the press, or to an adjunct thereto, is dog u^3, having spring u^4 bearing against its back for throwing it forward to engage with notch *t'* in pinion G, when the latter has been turned up to its full distance by the movement of rack-bar H.

Pivoted to the top of the press is lever u^5. This lever is connected at its lower end to dog u^3, at a point about at the middle of its length, by connecting-rod u^6. Secured to rack-bar H, at a point back of the rearward cog of the series in rack *u'* a little less than the length of the forward movement of the platen, is trip-block u^7, which is made to strike against the upper end of the lever u^5 and thrust it forward, (just before the platen has finished its forward thrust,) and, through connecting-rod u^6, draw dog u^3 out from engagement with pinion G, so as to leave the latter free to be turned back.

Secured to the upper end of quadrant-pinion shaft T is eccentrical quadrant-pulley T', Figs. 1 and 11. This pulley is so arranged in relation to quadrant-pinion G as to be in opposition to the same, and is connected (at its point of greatest throw) to compression spiral spring T^2 by pull strap, chain, or cord, t^2. This spring T^2 is inclosed in holder T^3, which is secured to the top of the press. The spiral spring is made to have its forward end bear against the forward end of holder T^3, and a draw-rod, t^3, passing through the forward end of the holder, and also through the spring, draws on the rear end of the latter and compresses the same when a drawing strain is exerted on draw strap or cord t^2 by eccentrical quadrant-pulley T'. By the employment of this latter device, with the compression spiral spring T^2, the elastic pressure is made to exert equal force on pulley T', for turning shaft T and swinging gate F from closing position at feed-opening *a* to an open position at the side of the feeding-chamber, as illustrated in Fig. 1.

Made in the top of the press is a narrow slot, g^2, in which bracket *u* (attached to platen I and connected with rack-bar H) works, as shown in Figs. 1 and 3.

In my duplex press I duplicate all the above-described parts, except the sprocket-wheel shafts *r r* of feeding mechanism E E', for said shafts extend from top to bottom of the press and pass through their respective feed-mechanism chambers of both feeding-chambers to actuate simultaneously the feeding mechanism.

The shaft T of lower clearing-gate, F', is made separate and independent of shaft of upper gate, F, and all adjunctive parts of this lower gate, F', and its shaft T, and rack-bar H' and its adjuncts, and dog u^3 and its adjuncts, and compression spiral spring T^2 and its adjuncts are similar to those parts above described, and are applied from the lower side of the press for operating lower gate, F', in the same manner as is upper gate, F, but alternately with the same, according as platens I I' are respectively moved alternately in opposite directions in their respective chambers, and forward and back past their respective feed-openings *a a'*.

The duplicated platens I I' are so geared to the driving-gear mechanism that they are made to move in their respective platen-chambers B B' in a reciprocating manner, with platen I moving forward while platen I' is being drawn back. To each of these platens are pivoted pitmen U. The opposite ends of these pitmen are each connected with crank-arms K, carried by vertical shaft U^2, supported in proper bearings by the frame-work of the press. Secured to double-crank shaft U^2, between the cranks, is gear-wheel U^3, which gear-wheel is actuated by pinion U^4, attached to vertical shaft S, which shaft is supported in proper bearings from a side of the frame-work of the press. The upper end of shaft S is preferably squared, and has attached to it sweep-lever V by a squared socket made with the connecting end of said lever, and the sweep is steadied by any ring, collar, and braces, or equivalent devices. Mounted on shaft S, at a point below the sweep, and at about on a plane with the top of the press-body, is bevel-gear *v*, which actuates bevel-pinion *v'*, secured to horizontal shaft v^2, supported in proper bearings from the timbers of the press. Mounted on this horizontal shaft is fly-wheel W, which will be revolved at high speed when bevel-gear *v* on shaft S is revolved by sweep-lever V, and the momentum of said fly-wheel will operate to aid the animal drawing on the sweep-lever to carry pitmen U U past the centers of the crank-arms at the finish of each stroke of the platens when the resistance to the platens is the greatest, and also operate to prevent rebound of the sweep after the pitmen have passed the centers of said crank-arms. The movement of sweep-lever V in direction of arrow in Fig. 1 will revolve drive-shaft S and give motion to sprocket-wheel R^4 on the said shaft at the same time motion is imparted to double-crank shaft U^2 and fly-wheel W.

Working in slots made in the top and bottom linings of the press are pivoted a series of dogs, Y. The engaging ends *y* of these dogs

are made with a vertical line of surface in front and with an inclined line of surface running rearwardly, as shown. The dogs working through the upper or top linings of both the platen-chambers are weighted forward of their pivots, while the dogs working through perforations made in the lower or bottom linings of said chambers are weighted rearward of their pivots. Made with the rear end of each of said dogs is an incline, *y'*, Fig. 3.

Secured to the rear ends of each platen, and to the upper and lower sides thereof, are wedging-blocks *z z*, in number and position corresponding with the number and position of dogs Y. Made in the top and bottom linings of the respective platen-chambers are slots *z' z'*, corresponding in number, size, and place with the number, size, and place of wedging-blocks *z z*. These slots *z' z'* are made with a length from the rear end of the top and bottom linings of the platen-chamber forward to a distance equal to the length of the movement of the platens in said chambers. When the platens are moved forward, the wedging-blocks *z z* will move forward in slots *z' z'* until the platens have made their full movement, and will carry wedging-blocks *z z* against inclines *y'* of the dogs and force their engaging ends *y* inward toward said platens and into recesses z^2 z^2, provided in the upper and lower sides of said platens from their forward ends.

A belt-wheel, Z, may be secured to the fly-wheel shaft v^2 for driving the gear mechanism of the press from any convenient power for operating the several moving parts of the press. In such a case I would employ a clutch with the fly-wheel and belt-wheel for the ready and convenient removal of the power from or application of the same to the gear mechanism of the press.

The manner in which the several parts of my improved press operate is as follows: The top lining, L, of the upper baling-chamber, B, and bottom lining, L', of the lower chamber, B', will be deflected, as indicated by dotted lines in Fig. 3, so as to give such a sufficient contraction to the discharge ends of said chambers as will produce an amount of friction which will be required to produce bales of preferred density. This deflection of said linings is produced by turning screw-nuts e^2 e^2, Figs. 1, 2, 3, and 4, on draw-bolts *e e'* against bars *d d'*, when said bars will be drawn against the rear ends of the stiffening-racks N N', bearing against linings L and L', and through said racks deflect said lining from true horizontal lines, as shown by full lines in Fig. 3, to slightly-inclined lines, as indicated by dotted lines in the same figure. The forward ends of said racks will be held from rising by their being held beneath cross-bars A^2, as shown in Figs. 1 and 3. By these above-described means one of the lining-walls of each baling-chamber will be so adapted to be set at will at a gradually-inclined line (in relation to the oppositely-located horizontal lining) which will extend from the rear end of pressing-chambers *b b'* to the discharge ends of said baling-chambers without any disturbance of the frame of the press, as heretofore required for producing a frictional resistance to the passage of the bale from the baling-chamber. If preferred, in some cases, the stiffening-racks N N' may be omitted and bars *d d'* may be made to have bearing directly on linings L L'. In such a case the deflecting lines of linings L L' will naturally partake a slightly-curved form.

Platens I I' are operated in a reciprocating manner in their respective chambers with the movements of the upper platen alternating in opposite directions with those of the lower platen. When the material to be formed into bales is introduced into the platen-chambers through their respective feed-openings *a a'* the respective platens will by their alternate forward movements thrust forward, alternately, the charges of material from their respective chambers B B' into their contiguous pressing-chambers *b b'*, where they will be shaped in a compacted section, to be subsequently alternately thrust rearward into the respective baling-chambers C C'. When the charges of material in the platen-chambers are being thrust rearward in direction of arrow 3 in Fig. 3, the material thus moved will be made to slide against the inclines made with the engaging ends *y* of dogs Y, and force said engaging ends outward from said material and elevate the opposite ends of said dogs, and when the platens have made their full-extent thrust toward their respective pressing-chambers the material will be carried fully into the latter and slightly past the engaging ends of said dogs, and at the same time the wedging-blocks *z z* (secured to the rear end portion of the respective platens) will ride on the inclined surface *y'* of dogs Y, and force the engaging ends of the same inward, so that they will bear against the rear side edge of the section of the compacted material thus thrust into the pressing-chamber, and be held from passing or moving back into the platen-chamber. These dogs are positively operated in one direction by the moving compacted section of material being pressed, and in the opposite direction by the platen, and the use of springs is dispensed with for holding them in effective engagement with the compacted material.

Platens I I' are operated alternately forward and backward in their respective platen-chambers B B' by the pitmen U, as they are actuated by crank-arms K, revolved by shaft U^2, through the medium of gears U^3, pinion U^4, shaft S, and sweep-lever V or belt-wheel Z. When the gear mechanism moving the platens is to be operated by a belt-wheel, the power will be transferred from said belt-wheel to the platens through horizontal shaft v^2, pinion *v'*, bevel-gear *v*, shaft S, pinion U^4, gear U^3, double-crank shaft U^2, crank-arms K, and pitman U, when fly-wheel W will operate to

equalize the movements of these several parts. When the gear mechanism is to be operated by the sweep-lever V, pinion U^4 on shaft S and gear U^3 on the double-crank shaft will be dispensed with, and a large driving-gear, x', (shown in dotted lines in Figs. 1 and 4,) will be secured to shaft S in place of pinion U^4, and a small gear-wheel, x^2, (about one-half the diameter of gear x',) will be secured to double-crank shaft U^2 in place of gear U^3, so that the double-crank shaft will be made to revolve twice to each revolution of drive-shaft S. When sweep-lever V is made to revolve shaft S, bevel-gear v on said shaft will actuate bevel-pinion v', and through it revolve fly-wheel W to a high speed, and thereby equalize the speed of driving-shaft S, when crank-arms K K are passing the centers, and also prevent a sudden acceleration of the movement of the sweep-lever toward the animal drawing on the same at the time of finish of the forward thrusts of the platens and its start backward, and thereby remove all possibility of endangering the animal by a rebound of the sweep, as heretofore had in baling-presses driven by sweep-lever. While the pressing-gear mechanism and platens are being operated, as above described, sprocket-gear R^4, attached to driving-shaft S, will, through endless chain R^3, revolve sprocket-wheel R', which sprocket-wheel will, through endless chain R^2 and sprocket-wheel R, revolve one of the shafts r and gear Q in direction of arrow 4 in Figs. 1 and 2. Gear Q will revolve gear Q' and its attached shaft r in direction of arrow 4 in same figures. These shafts r r will revolve their respective sprocket-wheels r' r', carrying chains r^2, moving in recessed ways s s, with their attached spurs q q moving in slots p p in direction of arrows 1 in Figs. 1 and 6. When the operator introduces a fork-full of hay (or other material to be pressed) into feeding-chamber D, (or D',) the rapidly-moving series of spurs q q of feeding mechanism E (or E') will engage with said material and carry it inward toward feed-opening a, (or a'.) While the material is being carried inward, the inclined or gradually-contracting sides of feed-chamber D (or D') will operate to gradually compress the material as it is being advanced into the platen-chamber B, (or B'.) As the material is being compressed by the inclined sides of said chamber, feeding-spurs q q will be made to have their strength of engagement with the material gradually increased, because of the increased compactness of the latter when approaching the feed-opening a (or a') before entering the platen-chamber.

It will be observed that the feed mechanism working in the inclined side b^2 of the feed-chamber next to the head end of the platen-chamber is made to run nigher to the platen-chamber, and that this incline curves back at x, so that spurs q will have engagement with the compacted charge of material being introduced until it has been nearly wholly introduced into the platen-chamber, and that this curved portion x of wall b^2 receives the entire length of spurs q in recessed slots s, and operates to withdraw said spurs from the material just about at the point the curved portion x of said wall contributes to enlarge the throat of the feed-chamber at the feed-opening to the platen-chamber. By this form of construction and arrangement of said parts the side portions of the compacted material next to the face of the platen (before it is carried forward) are made to fully enter the platen-chamber before the former has been moved forward past curved portion x of wall b^2. When the compacted charge has been introduced into the platen-chamber, the platen, moving forward, will force the charge toward and into pressing-chamber b, (or b',) when dogs Y will be operated by wedging-blocks z z and made to hold against the rear side of said compressed section of material.

When the charge of hay compacted in the feeding-chamber D (or D') has been about fully introduced within the platen-chamber by feed mechanism E (or E') platen I (or I') will have commenced its forward movement toward pressing-chamber b, (or b',) and, continuing its forward movement, it will carry pivoted rack-bar H (or H') forward with its rack u', engage with quadrant-pinion G, (or G',) and operating the same to swing gate F (or F') inward from its folded position at inclined side b^3 of feeding-chamber, as shown in Fig. 6, to a closed position at feed-opening a (or a') at the side of the platen, as indicated by dotted lines in same figure. The gate, in swinging forward to close feed-opening a, (or a',) will carry before it into the platen-chamber whatever of the rear end portion of the compressed charge of material there may be in the feed-chamber at the time the gate is closed. This closed gate will operate temporarily the same as the opposite side wall of the platen-chamber for guiding the compacted charge of material in its passage to pressing-chamber b, (or b'.) As soon as quadrant-pinion G (or G') has been operated by rack-bar H (or H') to fully close gate F, (or F',) tripping projection t will arrive at check u^2 on said rack-bar and lift the same. At the same time dog u^3 is made to engage with notch t' in said pinion, and hold the same locked from turning back. Thus dog u^3 and quadrant-pinion G (or G') are made to lock the gate in a closed position against the side of the platen-chamber until the platen has been moved to within three or four inches of the completion of its forward thrust. When the platen has nearly completed its forward movement toward pressing-chamber b, (or b',) tripping-block u^7, carried on the rear portion of rack-bar H, (or H',) will strike the upper end of lever u^5 and force the same forward toward quadrant-pinion G, (or G',) when dog u^3 will be drawn back out of engagement with notch t' in said pinion, and the pinion and its

connected gate will be free to be turned back to their normal positions by the united action of quadrant-pulley T′ and spiral spring T^2 and their connecting strap or chain t^2, and be held by the same with gate F (or F′) folded in its place in the face side of inclined wall b^3 of the feed-chamber. When gate F (or F′) is folded back to its normal position in its side of the feed-chamber, a second charge of material will be introduced in the feed-chamber, when the several devices will operate again to effect a like compression of the charge, and also the introduction of the same in a compacted form into the platen-chamber, and also a shutting in of the charge by the gate, and a thrusting forward of the same against the preceding charge, and moving both forward in the pressing-chamber and toward baling-chamber C, (or C′.)

As before stated, the upper and lower feeding mechanism, E E′, of the respective feeding-chambers are moved simultaneously, while gates F F′ are operated alternately with the movements of each of the latter, timed with the movements of the respective platens, which primarily operate to close and release their holding devices, as above described. It will therefore be readily understood that the charges of material to be formed into bales are to be introduced alternately in feeding-chambers D D′ at the times their respective gates F F′ are turned open, like as shown in feed-chamber D in Fig. 2, and such introduction of charges will be stopped while the gates are closed, like as shown in lower feed-chamber, D′, in same figure.

By these above-described improvements I am enabled to form two bales simultaneously by alternately-fed charges introduced mechanically into the platen-chambers in a compacted form of sections.

In Fig. 9 the gate F (or F′) is shown to be made with a hollow sleeve, c^2, having arms c^3 c^3, separated by slots c^4, with slots c^4 c^4 terminating with recesses c^5, made with the sleeve portion of the gate. When this gate is turned back into its place in side b^2 of feeding-chamber D, (or D′,) spurs q q of the feeding mechanism will be readily received into slots c^4 c^4 between arms c^3 c^3, while the spurs, when turning at the sleeve of the gate, will move recesses c^5 c^5, whether the gate be stationary or swinging toward or from side b^2.

If preferred, tripping projections t, made on pinion G, secured to gate-shaft T, and catching-notch t', made in said pinion, may be made with a separate and independent piece from pinion G and be secured to the same shaft; and also, if preferred, a weight, cord, and pulley may be substituted for spring T^2 for operating with the quadrant-pulley T′ for swinging gate F from a closed position to an open one; and, further, band-pulleys and bands or band-wheels may be employed in lieu of sprocket-wheels and endless chains for communicating motion to the feed mechanism from the revolving mechanism operating the pitmen of the platens.

By my above-described improvements a greater quantity of material will be formed into bales in a given time than has heretofore been accomplished, because of the automatic feeding of the material to the platen-chambers in a partly pressed or compacted form from material alternately introduced into the flaring ends of the feed-chambers in a convenient manner without any expenditure of time or manual labor for its introduction through the feeding-chambers to the platen-chambers.

I am aware that shallow and flaring-sided hoppers have been employed with the feed-opening to platen-chambers of a baling-press for the purpose of conducting, in a more cleanly manner, the material to be baled into the platen-chamber. Such hoppers form no part of my invention, as they are not in the least adapted to compact the material in its passage to the platen-chamber, as does my feeding-chamber; and, further, these shallow hoppers are not in the least adapted to receive a feeding mechanism in their sides for coaction with the sides for forming and introducing compacted sections of material into the platen-chamber, as is my above-described feeding-chamber. When bales have been formed of compacted material by successive charges received from the feeding-chambers, the bales will be tied off or banded and ejected in the usual manner practiced by the trade, which is so well known as to require no particular description.

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

1. In a baling-press, a baling-chamber which has one of its horizontal sides provided with a stiff and rigid lining, made substantially continuous and on a line with the plane of the corresponding lining of the platen and press chambers, the combination, with the same, of the oppositely-located horizontal lining, L, having its end at the press-chamber substantially continuous with the corresponding lining of the press-chamber, with its body in its rearward portion free to be inclined toward the oppositely-located rigid lining of the baling-chamber, and mechanism for forcing the body of the lining L to any preferred degree of relative inclination, for the purpose set forth.

2. In a baling-press, a baling-chamber which has rigid horizontal lining g at one of its sides, and at the oppositely-located side lining L, adapted to have its body adjusted to an incline in relation to lining g, in combination with depressing-bar d, draw-bolt e, provided with screw-nuts, and brackets f, substantially as and for the purpose set forth.

3. In a baling-press, the combination, with the baling-chamber having rigid lining g and the oppositely-located lining, L, which is adapted to have its body deflected rearwardly toward the rigid lining, of the stiff rack N,

having bearing against the exterior surface of the lining L, with its rear end adapted to be raised and lowered in relation to its forward end, and mechanism for forcing the rear end of said rack toward the chamber-room of the baling-chamber to deflect lining L, substantially as and for the purpose set forth.

4. In a baling-press, the dogs Y Y, constructed substantially as shown and above described, in combination with the horizontal walls of the platen-chamber, when arranged and pivoted with said walls in such a manner that their rear ends will be adapted to be moved by gravity toward each other and into the said platen-chamber, substantially as and for the purpose set forth.

5. In a baling-press, the combination, with dogs Y Y, pivoted in the oppositely-located horizontal side walls of the platen-chamber, and adapted to be moved by gravity toward each other with the holding ends entering the platen-chamber, of the reciprocating moving platen, having recesses z^2 made in the face end of said platen, whereby the face of the platen will be adapted to be carried to a point rearward past the engaging end of said dogs and thrust the hay away from the same, and thereby permit them to have a free upward movement, substantially as and for the purpose set forth.

6. In a baling-press having duplex platen-chambers and platens moving therein, the combination, with said platens, of double-crank shaft w^2 and pitmen connecting said platens with said double-crank shaft, of gear mechanism actuating said crank-shaft from a vertical driving-shaft, S, actuated by a belt-wheel and gear mechanism or by a sweep-lever, all substantially as and for the purpose set forth.

7. In a baling-press, the combination, with a platen working within a platen-chamber for compressing the material to be baled, and a crank-shaft connected to said platen by a pitman and revolved by gear mechanism from a driving-shaft, S, revolved by a sweep-lever, of a fly-wheel, W, actuated from said driving-shaft by gear mechanism speeding said fly-wheel, whereby the movement of the crank-shaft will be equalized and a rebound of the sweep-lever be prevented.

8. In a baling-press, a baling-chamber which has at two of its oppositely-located vertical sides a single opening, and each of its oppositely-located horizontal sides closed by substantially close linings, which are respectively on a plane with the top and bottom margin-lines of the openings at said vertical sides of said chamber, substantially as set forth.

9. In a baling-press, the combination, with a baling-chamber having its oppositely-located horizontal sides substantially closed, and at each of its oppositely-located sides a single opening terminating at top and bottom on a line with the plane of the close linings, of horizontal ways m m, secured to the inner surface sides of the said horizontal linings on lines between the margin-edges thereof and parallel with the same, substantially as and for the purpose set forth.

10. In a baling-press, a baling-chamber which has each of its two oppositely-located horizontal sides provided with a longitudinally-arranged way, m, secured to its inner surface side in a line parallel with the line of movement of the platen of the press.

11. In a baling-press, the combination, with the pressing-chamber, of the baling-chamber arranged in relation to the pressing-chamber as shown and described, and provided with two oppositely-located horizontal closed sides and single opening at each of its oppositely-located vertical sides extending from the plane of the inner side surface of the upper horizontal closing sides to the plane of the inner surface of the lower horizontal closing side, and mechanism wholly within the baling-chamber and connected with the closed horizontal sides for guiding the movement of a bale from the press-chamber to its discharge from the baling-chamber.

12. In a baling-press, the combination, with the pressing-chamber, of a baling-chamber arranged in relation to the pressing-chamber as shown and described, and provided with two oppositely-located horizontal closed sides and two oppositely-located vertical side openings, which extend from the plane of the inner surface of one of said horizontal closed sides to the plane of the inner surface of the other, and horizontal ways m m, situated within the said chamber and secured to the inner side surfaces of the horizontal closed sides, and extending from the rear end of the baling-chamber forward to or near to the front end of the pressing-chamber in lines parallel with the lines of movement of the platen of the press.

13. In a baling-press, the combination and arrangement, with a baling-chamber provided with two oppositely-located vertical openings extending from the plane of the top to bottom surfaces of two oppositely-located horizontal closed sides which are provided with ways m, of the partition-board M, provided in each of its upper and lower edges with grooves m', adapted to hold with ways m, secured to the said oppositely-located horizontal sides, whereby the said partition-board will be prevented in its passage through the baling-chamber from shifting laterally in either direction toward the said vertical side openings of the chamber.

14. In a baling-chamber, partition-board M, which is provided in its upper and lower edges with grooves m', adapted to hold with ways m, secured to each of the oppositely-located horizontal sides of the baling-chamber, and also provided with spurs m^2, adapted to hold with the compressed material, substantially as set forth.

15. In a baling-chamber, a partition-board which is guided by mechanism in its passage through a baling-chamber which has oppo-

sitely-located open sides, and spurs m^2, as and for the purpose set forth.

16. In a baling-press, the combination, with the pressing-chamber and baling-chamber, which have each of their two oppositely-located horizontal sides provided with ways m, extending from the front end of the pressing-chamber continuously to the rear end of the baling-chamber, of partition-board M, provided with grooves m' and spurs m^2, for operation substantially as set forth.

17. In a baling-press, a feeding-chamber formed by rigidly-secured vertical and horizontal side walls arranged at a feed-opening made in a vertical side wall of the platen-chamber, the said vertical and horizontal walls being so arranged in relation to each other that they will produce a gradually-contracting chamber-wall, which will be adapted to gradually compress the charge of material introduced as it is progressively moved forward to a discharge into the platen-chamber.

18. In a baling-press, the combination, with a platen-chamber provided in one of its sides with a feed-opening, of a feeding-chamber which has its vertical side walls rigidly fixed from moving, and set to flare outwardly at like angles with their contracting ends at the feed-opening, and mechanism located and moving within the feed-chamber at the inner side surfaces of the walls thereof, for the purpose set forth.

19. In a baling-press, the combination, with a feed-chamber which communicates with the platen-chamber of the press, and is provided with oppositely-located vertical side walls which are set at substantially the same angle of inclination for gradually contracting the feed-chamber as it extends toward the platen-chamber, of mechanism moving at the gradually-contracting inner surfaces of the oppositely-located side walls of the feed-chamber, and adapted to engage with the opposite sides only of the charge of material for gradually compacting the charge and moving it progressively forward and into the platen-chamber.

20. In a baling-press, the combination, with the platen-chamber thereof, and a feeding-chamber communicating with said platen-chamber, and provided with inwardly-inclined or tapering vertical side walls which are set at about equal angles to the side walls of the platen-chamber, of feed mechanism which is operated automatically and independent of the movement of the platen in the platen-chamber.

21. In a baling-press, a feeding-chamber having oppositely-located inclined sides, and a feed mechanism which is continuously moved in direction toward the contracted end of said chamber while the platen is being moved back to the forward end of the platen-chamber.

22. In a baling-press, a feeding-chamber having a feed mechanism which is moved continuously in direction toward the feed-opening in a side of the platen-chamber while the platen is being moved in either direction within the platen-chamber.

23. In a baling-press, an endless feeding mechanism which is continuously moving in direction toward the feed-opening to the platen-chamber while the platen is moving therein for automatically feeding material to be baled into the platen-chamber.

24. In a baling-press, the combination, with a feeding-chamber having two oppositely-located inclined sides, of an endless feed mechanism which is continually moving in direction toward the feed-opening to the platen-chamber while the platen is moving therein, whereby material will be automatically introduced in the platen-chamber in compacted sections to be compressed into a bale, substantially as set forth.

25. In a baling-press, the combination, with platen-chamber B, (or B′,) provided with a feed-opening at one of its sides, of feed-chamber D, (or D′,) provided with gradually-contracting side walls, as above described, and feeding mechanism E, (or E′,) above described, substantially as and for the purpose set forth.

26. In a baling-press, a feeding device for introducing into the platen-chamber sections of compacted material, consisting of the combination, with feed-chamber D, (or D′,) having two of its oppositely-located sides, b^2 and b^3, set flaring or inclined outwardly in relation to each other, of feeding mechanism E, (or E′,) which is moved continuously in direction from the flaring open end toward the contracted end of said feeding-chamber and the feed-opening to the platen-chamber of the press, as set forth.

27. In a baling-press, the combination, with its platen-chamber having a feed-opening at a side thereof, of a feeding-chamber D, (or D′,) having inclined sides b^2 b^3, each provided with a series of slotted ways, p p, of endless chains r^2 r^2, carrying spurs q q in said ways and revolved in opposite directions by sprocket-wheels from shafts r r by means of mechanism driven by revolving mechanism operating platen I (or I′) of the press, substantially as set forth.

28. In a feeding-chamber, D, (or D′,) which has gradually-contracted sides b^2 b^3, terminating at a feed-opening of a platen-chamber of a baling-press, and feeding mechanism working in said sides and moving toward the contracted open end of said feed-chamber, the curved wall-surface portion x, made with side b^2 of feed-chamber D (or D′) at the junction of the contracted end of the same with the platen-chamber, substantially as and for the purpose set forth.

29. In a baling-press, the combination, with a platen-chamber having a feed-opening in a side thereof, and a feed-chamber discharging into said platen-chamber, of a closing-gate which is pivoted at the front margin-edge of

the feed-opening and at a point about at the point of termination of the forward transit of the platen, and adapted to be swung rearwardly to the front margin-edge of the same, and when closed be in position parallel with the line of the wall of the platen-chamber, whereby the greatest pressure-strain on said gate will be sustained by the hinged pivots of the same.

30. In a baling-press, the combination, with the platen-chamber and a feeding-chamber communicating with the platen-chamber and a feed-opening made in a side of the latter, of an automatically-operated closing-gate hinged at the intersection of the rear-edge termination, the feed-opening of the platen-chamber with the rearward wall of the feeding-chamber, whereby the gate will be adapted to swing forward to close the feed-opening and rearward to fold against the rear side walls of the feed-chamber without obstructing the movement of the charge of material through the said feeding-chamber to the platen-chamber.

31. In a baling-press having a feed-opening in a side of its platen-chamber, the combination, with said platen-chamber opening and gradually-contracting walls of a feeding-chamber which communicates with said opening, of a gate so hinged at the intersection of the rearward marginal vertical edge of said feed-opening with the rear side walls of the feed-chamber as to adapt the gate to be swung in one direction to close the said opening and in an opposite direction to fold against the rear vertical side walls of the feed-chamber, and mechanism for automatically moving the gate alternately in both directions, as set forth.

32. In a baling-press, the combination, with a platen-chamber having a feed-opening in a side thereof, and feed-chamber communicating with said platen-chamber, and having rigid vertical side walls which effect a gradual contraction of said feed-chamber, of gate F, (or F′,) hinged at the intersection of the rear wall of the feed-chamber with the rear marginal side of the feed-opening, mechanism operated by the movement of the platen to close said gate to the opening to the platen-chamber, and mechanism operating independently of the platen for moving the gate outward from said opening, for the purpose set forth.

33. In a baling-press having a feed-opening in a side of its platen-chamber, and a gradually-contracting feed-chamber located exteriorly to the platen-chamber, with its contracted end communicating with the latter through said feed-opening, and in combination with the same, gate F, (or F′) and mechanism for automatically moving said gate alternately toward the platen to close the feed-opening in the platen-chamber, and from said platen to open said gate outward from said feed-opening to fold against a side of the feeding-chamber, for the purpose set forth.

34. In a baling-press, gate F, (or F′,) having hollow sleeve c^2, for rigid attachment to a turn-shaft, T, at a side wall of the press, and arms c^3, made in connection with said sleeve and separated by slots c^4, whereby said gate will be adapted to be turned against a side of a feeding-chamber in which spurs of a feeding mechanism are moving, substantially as set forth.

35. In a baling-press, the combination, with a platen-chamber provided with a feed-opening, a feeding-chamber arranged exteriorly to the platen-chamber and communicating with the same through said feed-openings, and feeding mechanism moving in the sides of the feeding-chamber toward the platen-chamber, of a gate which is automatically operated toward the platen-chamber to close the feed-opening thereto, and back from said platen-chamber to a side of the said feeding-chamber, for the purposes set forth.

36. In a baling-press, the combination, with the platen-chamber having a feed-opening in a side thereof, and a feeding mechanism which will compact the material while it is being moved forward to the platen-chamber, and feeding mechanism which has its spurs moving continuously in the sides of the feeding-chamber toward the platen-chamber, of a gate which is operated automatically to alternately open and close communication between the feeding and platen chamber.

37. In a baling-press, the combination, with a platen-chamber having a feed-opening in its side, and feed mechanism moving in the sides of a feeding-chamber toward the platen-chamber, of gate F, (or F′,) pivoted from the body of the press, and mechanism operated by the forward movement of the platen to swing said gate from a side of the feeding-chamber to a closing position at the feed-opening in the platen-chamber while the platen is being moved forward thereon, and mechanism for effecting a release of the holding of the gate at the feed-opening before the platen has fully completed its forward movement.

38. In a baling-press, the combination, with the platen-chamber having a feed-opening in one of its sides, and a gate adapted to close and open from said feed-opening, and mounted on shaft T, of the quadrant-pinion also mounted on said shaft, and rack-bar H, pivoted to platen I, for operation substantially as set forth.

39. The combination, with gate F (or F′) of quadrant-pinion G (or G′) and a tripping projection, all secured with shaft T, so as to turn with the same, of rack-bar H, (or H′,) pivoted to platen I, (or I′,) and having cheek u^4, substantially as and for the purpose set forth.

40. The combination, with gate F, (or F′,) quadrant-pinion G, (or G′,) shaft T, and catching-notch t', made with said pinion, and with a piece secured to said shaft, of elastic dog u^3, and mechanism for releasing said dog by the action of the forward movement of the platen carrying the rack-bar, substantially as and for the purpose set forth.

41. In a baling-press, the combination, with

the platen-chamber provided with a feed-opening, and gate F, adapted to be moved in one direction to close said feed-opening, and in the opposite direction to open the same, of mechanism secured to a stationary point of the press and connecting with the gate-shaft, whereby the said gate will be moved from a closed position to an open one, when other mechanism, operated by the movement of the platen, releases its hold on the gate, substantially as set forth.

42. In a baling-press, the combination, with feeding-chamber D and feeding mechanism E, moving at the sides of said feeding-chamber toward a feed-opening made in a side of the platen-chamber of the press, of closing-gate F, adapted to be received in a side of the feeding-chamber at the same time the feeding mechanism is in motion, mechanism operated by the forward movement of the platen for swinging said gate from the side of the feeding-chamber to the opening to the platen-chamber and holding the same closed thereto, and mechanism for releasing said gate from such holding, and for swinging the same back in the side of the feeding-chamber, substantially as set forth.

43. In a baling-press, the combination of a platen-chamber provided with a feed-opening, compressing feeding-chamber, feeding mechanism contained within the feeding-chamber and moving continuously toward the platen-chamber, platen feed-opening-closing gate, and mechanism for operating said gate independently of the mechanism operating the feeding mechanism, all for the purpose set forth.

ALBERT S. ROBINSON.

Witnesses:
RICHARD P. DUMARY,
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