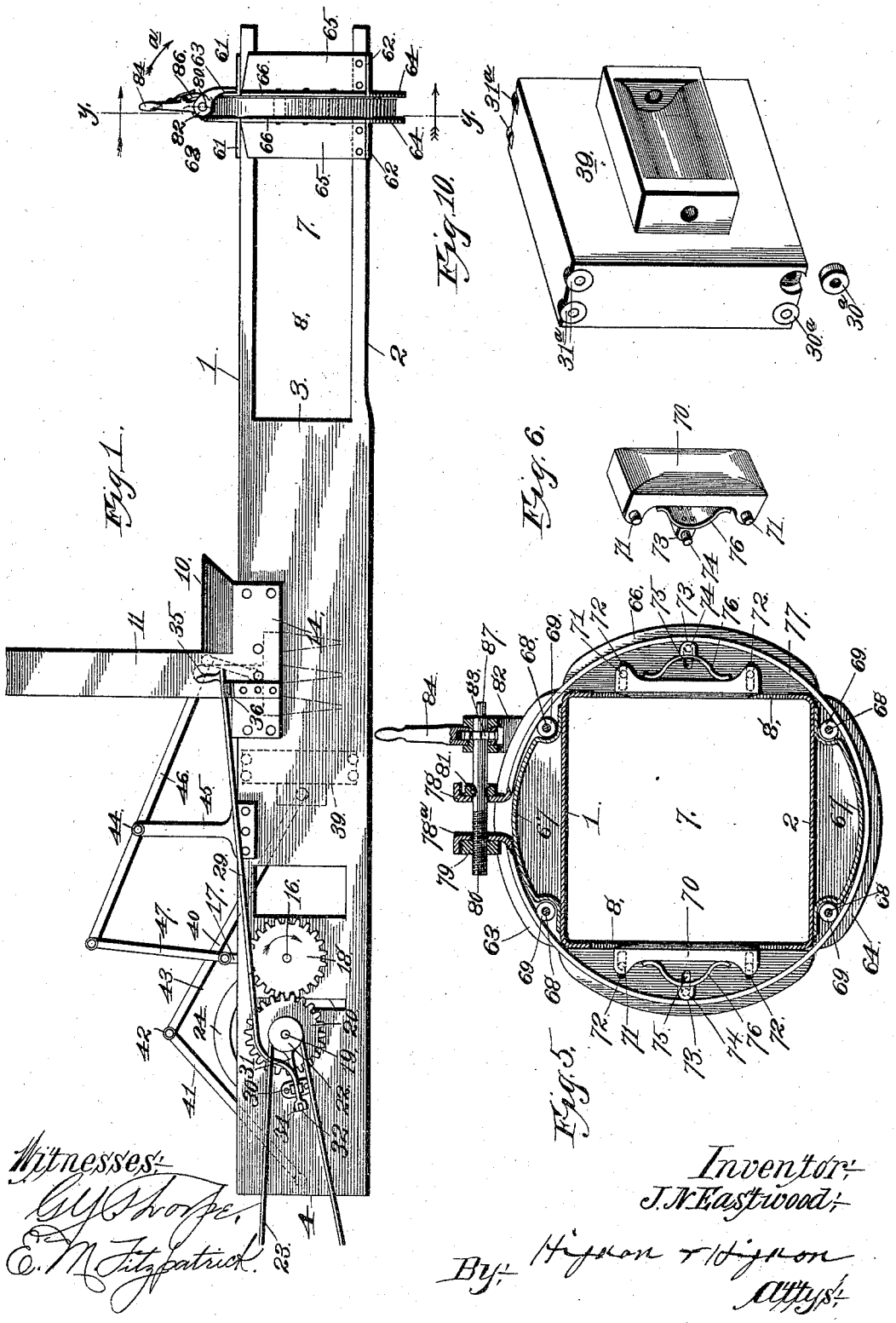
(No Model.) 3 Sheets—Sheet 1.

J. N. EASTWOOD.

HAY PRESS.

No. 526,441. Patented Sept. 25, 1894.



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C. L. Troupe,
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Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

J. N. EASTWOOD.

HAY PRESS.

No. 526,441. Patented Sept. 25, 1894.

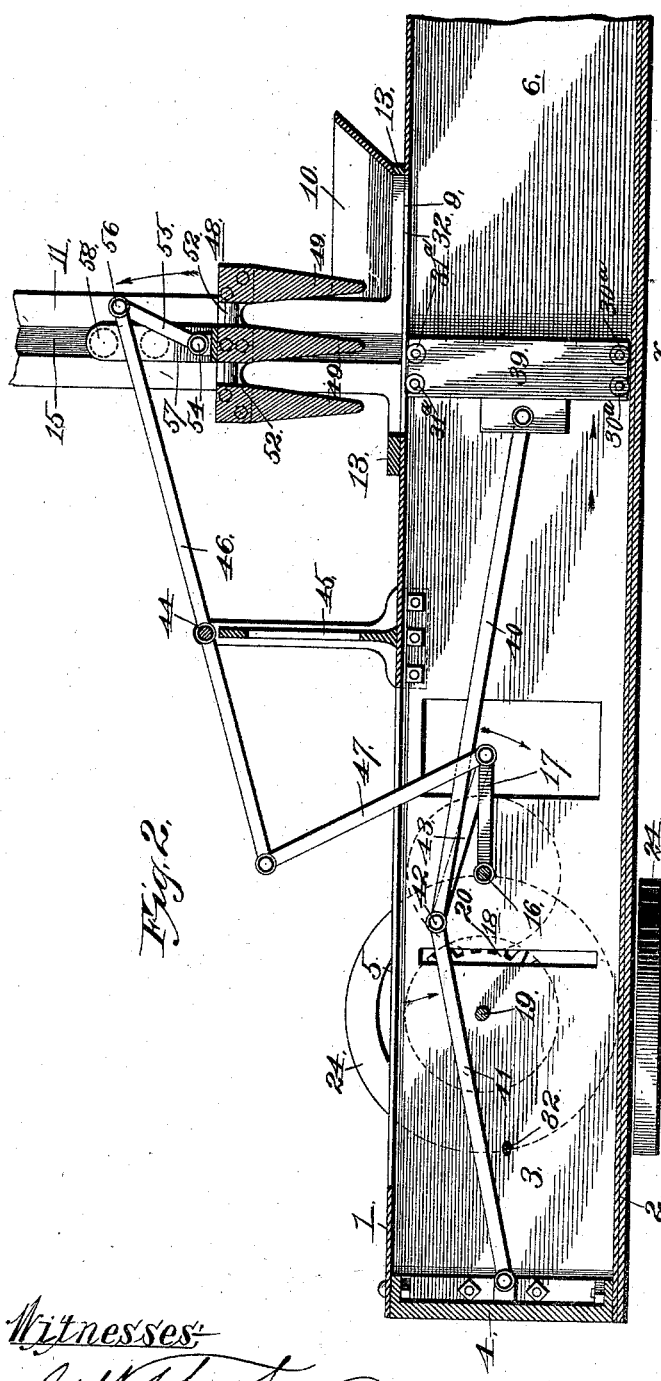

Fig. 2.

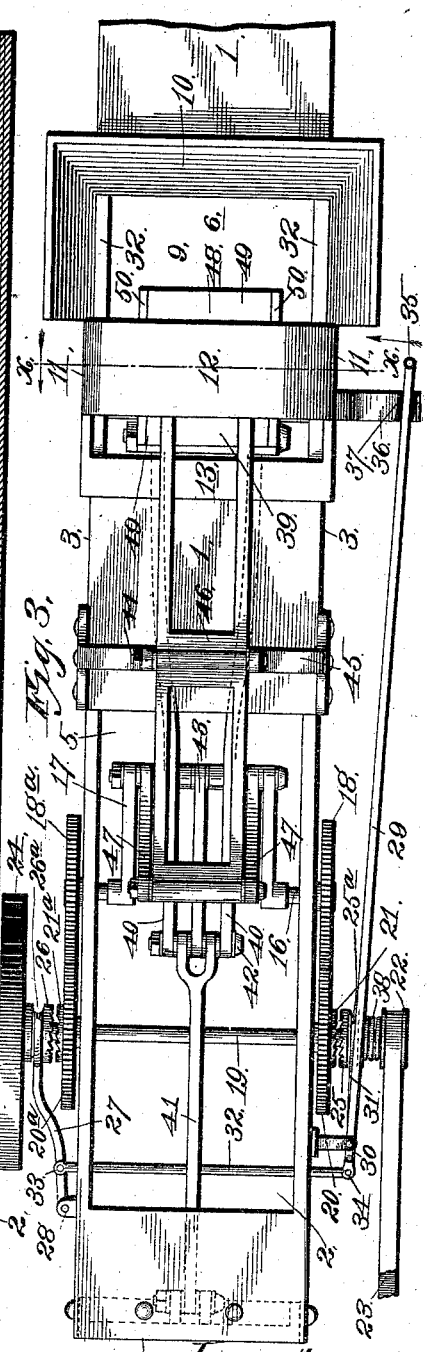

Fig. 3.

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(No Model.) 3 Sheets—Sheet 3.

J. N. EASTWOOD.

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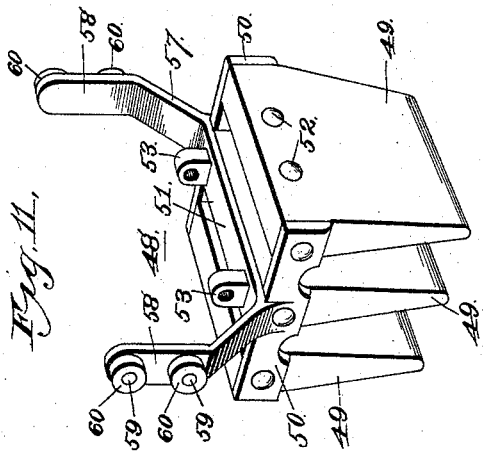

Fig. 11.

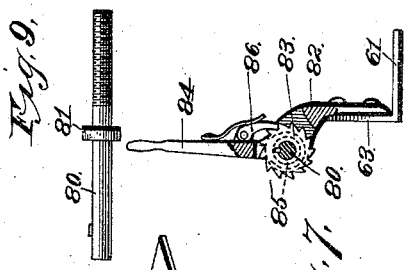

Fig. 9.

Fig. 7.

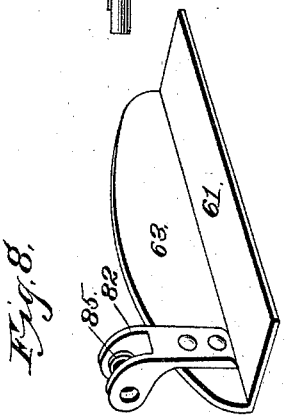

Fig. 8.

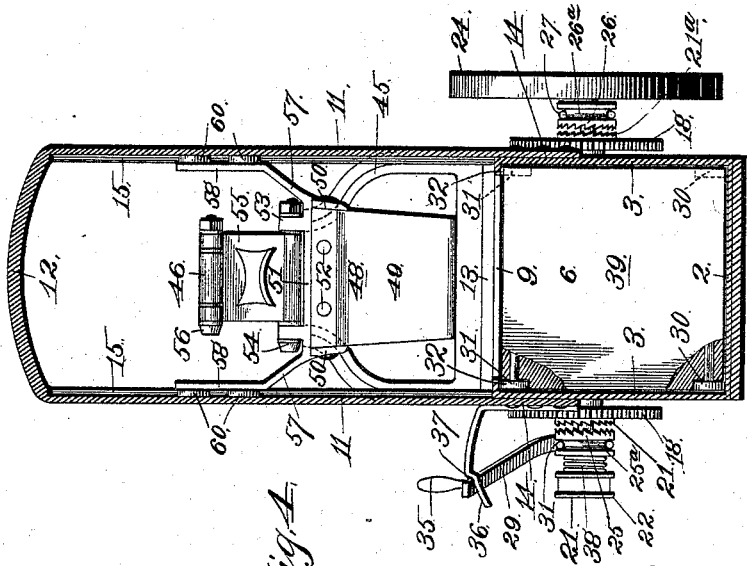

Fig. 4.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES N. EASTWOOD, OF KANSAS CITY, MISSOURI.

HAY-PRESS.

SPECIFICATION forming part of Letters Patent No. 526,441, dated September 25, 1894.

Application filed November 27, 1893. Serial No. 492,035. (No model.)

To all whom it may concern:

Be it known that I, JAMES N. EASTWOOD, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Hay-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to hay-presses, and the objects of the invention are to produce a power-mechanism which is direct and positive in action; means to throw the power mechanism in or out of gear, without interrupting or affecting the running of the engine or other motive power; a self-feeder, which, actuated by the same power as the power-mechanism, may also be thrown in and out of gear coincidently therewith; means to simultaneously compress the front or discharge end of the friction-chamber at all four sides; and finally to produce a hay-press which is simple, strong, and durable of construction, and under perfect control.

With these objects in view, my invention consists in its peculiar and novel construction, and combinations of parts, as will be hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a hay-press constructed in accordance with my invention. Fig. 2 is a vertical sectional view of a portion of the same on an enlarged scale. Fig. 3 is a top plan view of that portion of the hay-press, which is shown in Fig. 2. Fig. 4 is a vertical sectional view taken on the line *x*—*x* of Fig. 3. Fig. 5 is a vertical sectional view, taken on the line *y*—*y* of Fig. 1. Fig. 6 is a detail perspective view of one of the spring-actuated side clamping-blocks. Fig. 7 is a vertical sectional view of the mechanism for compressing the discharge end of the hay-press. Fig. 8 is a detail perspective view of a plate carried at the discharge end of the hay-press, and also showing the bearing carried thereby. Fig. 9 is a detail view of the clamping-bolt. Fig. 10 is a detail perspective view of the plunger. Fig. 11 is a detail perspective view of the feeder.

Referring to the said drawings, where similar numerals refer to corresponding parts in all the figures, 1 designates the top, 2 the bottom, and 3 the side walls of a hay-press. The rear end of the said press is closed by a head 4, while the front or discharge end is open. The top wall 1, near the rear end is formed with an elongated opening 5, to permit the free operation of the power-mechanism, to be hereinafter referred to, and the side walls 3, terminate at the junction of the compression chamber 6, and the friction chamber 7, so as to form or provide the elongated side openings 8, at the front or discharge end of the machine, for a purpose to be hereinafter explained.

About midway the length of the compression chamber 6, the top wall 1, is formed with a feed-opening 9, with which communicates the hopper 10. Erected vertically from each side of the machine, and opposite the feed-opening 9, are the similar standards 11, and these standards, for the sake of strength are united integrally at their upper and lower ends by cross bars or portions 12 and 13, respectively; the lower cross-bars 13, resting upon the wall 1, of the machine at opposite ends of the feed-opening 9. The standards 11, project downwardly, as shown at 14, and are bolted or riveted to the sides of the machine. Formed in the inner faces of the standards 11, are the vertical and oppositely disposed guide-grooves 15, which extend the full length of the standards 11. The object of these guide-grooves will be hereinafter explained.

Journaled transversely of the machine a suitable distance rearward of the front end of the elongated opening 5, is the horizontal crank-shaft 16. The crank-section 17, of said shaft is located within the machine, and mounted upon the projecting ends of the said shaft, are the similar gear-wheels 18, 18^a. Rearward of and arranged in the same horizontal plane as the said crank-shaft, and also journaled transversely of the machine, is a shaft 19, and mounted loosely upon the opposite ends of said shaft, are the gear-wheels 20, and 20^a, which mesh respectively with the gear-wheels 18, and 18^a, of the crank-shaft, and these gear-wheels 20, and 20^a, are provided respectively with the ratchet-clutch-sections 21, and 21^a, respectively, upon their outer faces.

Mounted upon one end of the shaft 19, is a belt-pulley 22, which is connected through the medium of the belt 23, with the engine or other suitable motor power. (Not shown.) Mounted upon the opposite end of the shaft 19, is a fly or balance wheel 24. Keyed to slide upon and revolve with the shaft 19, are the ratchet-clutch-sections 25, and 26; the section 25, being interposed between the clutch-section 21, and the belt-pulley 22, and the clutch-section 26, being interposed between the clutch-section 21^a, and the fly or balance wheel 24. The clutch-sections 25, and 26, are annularly grooved at 25^a, and 26^a. A lever 27, is pivotally mounted at 28, between ears or lugs projecting from the adjacent side of the machine, and this lever is also forked or bifurcated in the usual manner at its free end to engage the annular groove 26^a, of the clutch-section 26. A lever 29, is pivotally mounted near its rear end, at 30, upon ears or lugs projecting from the adjacent side of the machine, and is provided with a forwardly projecting arm 31, which is bifurcated or forked at its front end to engage the annular groove 25^a, of the clutch-section 25.

A link-rod, 32, extends transversely of the machine, and is pivotally connected at 33, to the lever 27, a suitable distance forward of the pivotal point 28, thereof, and the link-rod 32, is pivotally connected at its opposite end, at 34, to the rear end of the lever 29. The lever 29, is of considerable length, extending forwardly to a point adjacent to the hopper 10, so that the person feeding the hay into the press, may also operate said lever, which is provided with a handle 35, at its front end, without moving from his position adjacent to the hopper. Riveted or bolted to the side of the adjacent standard 11, is one end of the spring-plate 36, which projects outwardly from the press and beneath the free end of the lever 29, to serve as a guide therefor, and this spring-plate or catch, is provided with a recess near its outer end, to form a shoulder 37, for a purpose to be presently explained.

From the foregoing, it will be seen that when the lever 29, is in the position shown in Fig. 3, that is, outward, and is locked or secured in such position by the lever 29, bearing against the shoulder 37, of the spring-catch 36, the clutch-sections 25, and 26, are out of engagement with the clutch-sections 21, and 21^a, respectively, and therefore, the gear-wheels 20, and 20^a, remaining idle or inoperative upon the revolving shaft 19, the crank-shaft 16 is not in operation. When, however, the lever 29, is operated in the direction of the arrow, Fig. 3, the sliding clutch-sections 25, and 26, will be moved inward and will engage their respective clutch-sections 21, and 21^a, and will therefore, through the medium of the gear-wheels 20, 20^a, and 18, 18^a, cause the operation of the crank-shaft 16, as will be readily understood. To insure that the clutch-sections 25, and 26, are moved inward when the lever 29, is disengaged from the shoulder 37, and also to hold them firmly into engagement with their respective and opposing clutch-seetions, I mount a spring 38, upon the shaft 19, and said spring is interposed between the belt-pulley 22, and the clutch-section 25, so as to always exert an inward pressure against said clutch-section. This spring 38, can be made sufficiently strong, if necessary, to throw the clutch-sections 25, and 26, into engagement with their respective clutch-sections 21, and 21^a, respectively, immediately the lever 29, is disengaged from the shoulder 37.

Located within the machine, is the plunger 39, which is mounted at its lower end upon the rollers 30^a, and is provided at its upper end and in its side margins with the anti-friction rollers 31^a, which are adapted to operate against the under side of the top wall 1, and the flanges 32^a, which project inwardly from each side margin of the feed-opening 9. This plunger 39, is pivotally connected to the head 4, of the machine, through the medium of a toggle-joint; said toggle-joint consisting of the bars 40, and 41. Pivotally mounted within the bifurcated end of the lever 41, and upon the pivotal bolt, 42, which connects the bars 40, and 41, is a lever 43, and this lever is pivotally mounted at its opposite end upon the crank-section of the crank-shaft 16.

It will be apparent from the foregoing, that that the operation of a crank-shaft will cause the lever 43, to alternately contract and expand the toggle-joint, so as to reciprocate the plunger 39, within the compression chamber 6.

Pivotally mounted upon the cross bolt, 44, which is supported in the upper end of a bracket or casting 45, bolted or otherwise secured upon the machine, and adjacent to the front end of the opening 5, is a walking-beam 46, and the rear end of this walking-beam is pivotally connected through the medium of the levers or link-bars 47, with the crank-section 17, of the shaft 16, and the front end of said walking-beam is adapted, through the operation of the said crank-shaft, to move in a vertical plane between the standards 11. A feeder, 48, consists of a number of blocks 49, V-shaped in cross section, arranged vertically and a slight distance apart. These blocks 49 are rigidly secured in such position by means of a casting, consisting of a pair of end-plates 50, which are bolted to the ends of said blocks, and a bridge plate 51, which rests upon the upper end of the middle block, preferably as shown in Fig. 11. The blocks may also be additionally secured together by bolts 52, or in any other suitable manner.

Projecting upwardly from the bridge plate 51, and near opposite ends of the same, are the ears or lugs 53, and pivotally mounted upon a bolt 54, passing through said ears or lugs, is a link-plate 55, the opposite or upper end of which is pivotally connected through the medium of a bolt 56, with the forward

end of the walking-beam 46. It will now be seen, that when the walking-beam is pivotally operated, the feeder 48, will be raised and lowered alternately, and in order to guide said feeder to reciprocate vertically, a pair of arms 57, project divergently outward and upward from the opposite ends of the bridge-plate 51. These arms may be secured to said plate, or may be formed integral therewith, as shown. The arms 57, terminate in the vertical portions 58, which are a sufficient distance apart to fit snugly within the standards 11, and mounted revolubly upon the outwardly projecting pins or projections 59, of said portions 58, are the anti-friction rollers 60, which fit and are adapted to operate in the guide grooves 15, of the standards 11. It will be apparent, by stationing or locating the rollers 60, of each arm, a suitable distance apart, any swinging movement in a forward or rearward direction is prevented, and the feeder is caused to reciprocate vertically.

It will be seen from the construction set forth, that as the plunger is moved forward to compress the hay, the feeder is automatically elevated, and that as the plunger is withdrawn after the pressing operation, and hay is fed by the operator through the hopper, the descending feeder presses or packs the same, in front of the plunger, and is again elevated as the plunger moves forward.

Secured rigidly upon the outer side of the top and bottom walls 1 and 2 of the machine, and at its forward or front end, are the castings or plates 61, and 62, respectively, and the plates 61, are provided at their inner margins with the vertical flanges or walls 63, which extend transversely of the machine, and form a guide-way therebetween.

Projecting vertically downward from the inner margins of the plates 62, at the bottom of the machine, are the similar flanges 64, which also extend transversely of the machine, and form a guide-way, which lies in the same vertical plane as the guide-way between the flanges 63. Bolted or otherwise rigidly secured at their lower ends to the bottom wall 2, of the machine, and at each side thereof, are the vertical plates 65, the upper ends of which fit snugly against the outer sides or margins of the top-wall 1, and are adapted to form a guide for said top-wall, as will be hereinafter explained, and these plates 65, are also provided at their inner margins with the outwardly projecting and parallel flanges 66, which lie in the same vertical plane as the flanges 63, and 64, of the top and bottom plates, and also go to make continuous, the guide-way between the flanges 63, and 64. Secured upon the top-wall, and to the under side of the bottom wall, and also extending transversely thereof, and between the flanges 63, and 64, respectively, are the arched plates or bridges 67, and mounted revolubly upon the pins 68, which extend transversely of the guide-way, and at each end of the arched plates or bridges 67, are the anti-friction rollers 69; the object of which will be presently explained.

Arranged vertically between the flanges 66, of the plates 65, and opposite the openings 8, are the oppositely disposed blocks 70, and these blocks to support them in position, are provided at their upper and lower ends with the laterally projecting pins or lugs 71, which engage the slots or elongated openings 72, formed in the flanges 66. A cross-bar, rounded at its outer side as shown at 73, also occupies a position centrally of the slots 72, and between the flanges 66, and is provided with the pins or lugs 74, which engage the slots 75, of said flanges. A spring 76, is secured at its middle to the inner side of each cross-bar, and has its ends bearing, as shown clearly in Fig. 5, against the outer side of its corresponding block 70. These blocks 70, are also beveled inwardly or rounded at their inner sides, so as to present no abrupt surface which will resist the passage of the completed "bale," from the friction-chamber of the machine. It will be seen from the foregoing that the blocks 70, are adjustable to increase or diminish the width of the friction chamber, and that the springs 76, always exert a yielding pressure against said adjustable plunger.

Fitting in the continuous guide-way hereinbefore referred to, is a tension strap 77, which engages frictionally against the rollers 69, and the rounded surfaces 73, of the spring-carrying cross bars, which may also be provided with anti-friction rollers if desired, and also bearing if desired against the arches or bridges 67; and the adjacent ends of this tension strap, extend vertically upward and a suitable distance apart, as shown at 78 and 78^a. Secured rigidly, or formed integrally if desired, to one of said ends, is a screw threaded nut or enlargement 79, and passing loosely through said up-turned portions 78, and 78^a, and engaging the internally threaded nut 79, is a tension bolt 80, and this tension bolt is provided with a collar or enlargement, preferably integral, 81, which bears against the outer side of the upturned portion 78. The opposite end of this bolt 80, is journaled loosely in a bearing 82, which is riveted or otherwise rigidly secured to the outer side of one of the flanges 63. Mounted rigidly upon the bolt 80, and occupying the bifurcation of the bearing 82, is a ratchet-wheel 83. A lever 84, is pivotally mounted upon the cylindrical bosses 85, of the bearing 82, and carries a spring-actuated pawl 86, which is continually in engagement with the ratchet-wheel 83.

When it is desired to diminish the size of the discharge end of the friction chamber, the lever 84, is grasped and operated in the direction of the arrow *a*, Fig. 1, and the pawl 86, engaging the ratchet-wheel 83, causes the operation of the bolt 80, and the tightening of the strap 77. The tightening of the strap 77, in turn, bearing upon the spring-carrying cross-bars, causes the inward movement of the

blocks 70, and at the same time the top and bottom walls of the machine, being of spring metal, are caused to move or bend downward and upward respectively, so as to diminish the height of the friction-chamber at the same time that the width of said chamber is diminished. It will thus be apparent that the frictional resistance to the passage of the "bale," so as to form the same more or less compact, may be increased or diminished at will. In order to diminish the tension, or to enlarge the discharge end of the passage, the pawl 86, must be held out of engagement with the ratchet-wheel 83, and a wrench or crank-handle be fitted upon the squared-end 87, of the bolt, so that said bolt may be turned or operated in the reverse direction.

If desired, in manufacturing my improved hay-press, I may mount or secure rigidly at the front end of the machine a gas-engine, not shown, which will be connected up to the power mechanism through the medium of the belt 23, to operate the machine. In fact, it is my intention at present to construct the baling-press with a suitable platform at its front end upon which a gas engine may be conveniently and easily mounted, but I wish it to be understood that I may employ any suitable motive power desired, and that I do not limit myself to any particular kind of power, or to any particular intermediate mechanism, such as a belt 23, or chain, whereby said power may be transmitted to the power mechanism of the hay-press.

It will also be apparent in the operation of the machine, that by providing a balance-wheel upon the end of the shaft opposite to that where the belt-pulley is mounted, that I obtain a uniform power upon each end of the shaft 19, and that the said power is more equally distributed or transmitted to the crank-shaft, which would not be the case were the balance-wheel discarded.

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

1. In a hay-press, the combination with a plunger, a crank-shaft operatively connected thereto, gear-wheels keyed thereon, a continuously rotating shaft, gear-wheels mounted loosely thereon and meshing with the gear-wheels of the crank-shaft, and provided with ratchet-clutch sections, of a pair of sliding clutch-sections upon said shaft and rotating therewith levers having forked ends engaging annular grooves in the clutch-sections, a link-rod pivotally connecting said clutch-levers at opposite sides of their fixed pivotal point, a hand-lever connected to one of said clutch-levers, a locking-plate having a shoulder to engage said handle lever and hold the clutch-sections out of engagement, and a spring to force them into engagement when the lever is engaged from said shoulder, substantially as set forth.

2. In a hay-press, the combination with a crank-shaft, and a walking-beam linked to the crank-shaft, of a self-feeder 48, arms projecting divergently upward therefrom and terminating in vertical and parallel portions, a pair of vertically aligned anti-friction rollers carried at the outer sides of each of said arms, and standards, having grooves engaged by said rollers, substantially as set forth.

3. In a hay-press, the combination with a friction-chamber composed of top and bottom walls, vertical guide-plates carried by one of said walls, and embracing the vertical side-edges of the opposite wall, to form a guide for said opposite wall, when moved; adjustable spring-actuated blocks carried by said guide-plates, plates secured to the top and bottom walls, and anti-friction rollers carried thereby, an encircling strap engaging said anti-friction rollers and said blocks, and means to tighten or tension said strap, so as to diminish the discharge end of the friction-chamber, substantially as set forth.

4. In a hay-press, the combination with a friction-chamber comprising spring metal top and bottom walls, and flanged plates secured thereto, so as to form a continuous guide-way, and adjustable spring-actuated blocks carried in said guide-way, and anti-friction rollers also mounted in said guide-way, of an encircling strap, a casting carried by one of said flanged plates, a bolt mounted in said casting and passing loosely through one end of said strap and operatively engaging the other, a ratchet-wheel mounted upon said bolt, a lever, and a spring-actuated pawl carried by said lever and engaging said ratchet-wheel, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES N. EASTWOOD.

Witnesses:
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