(No Model.) 3 Sheets—Sheet 1.

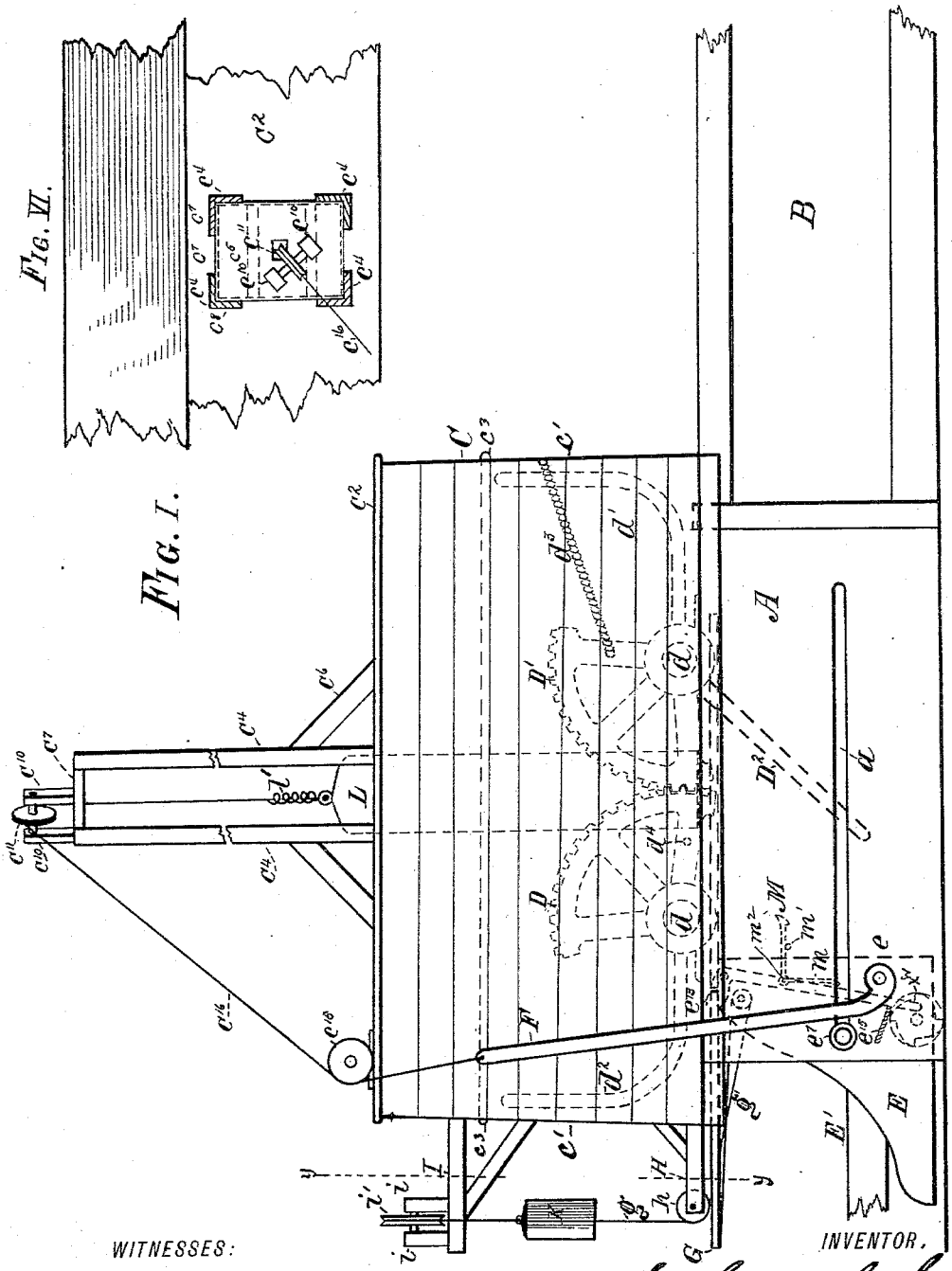
E. C. SOOY.

BALING PRESS.

No. 384,294. Patented June 12, 1888.

FIG. II.

FIG. I.



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(No Model.) 3 Sheets—Sheet 2.

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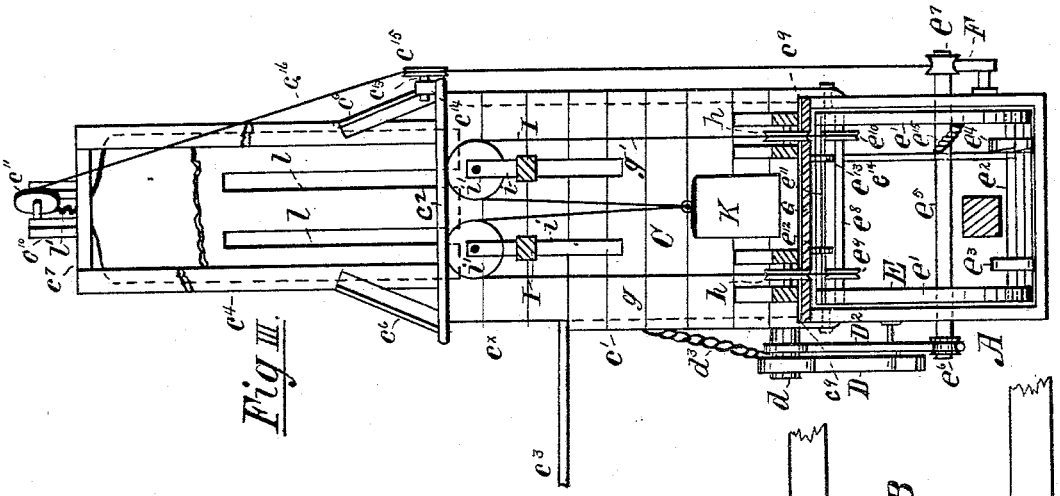

Fig. III.

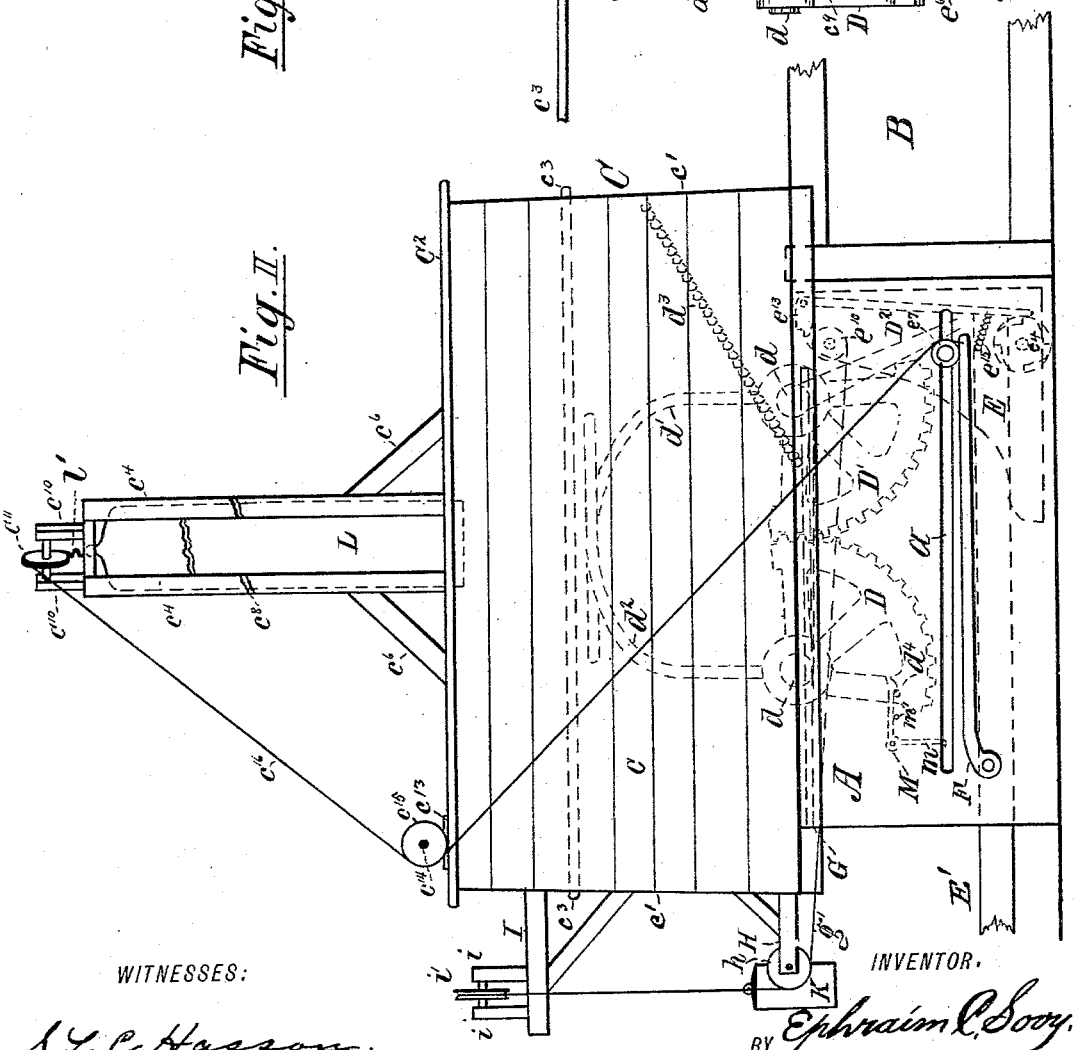

Fig. II.

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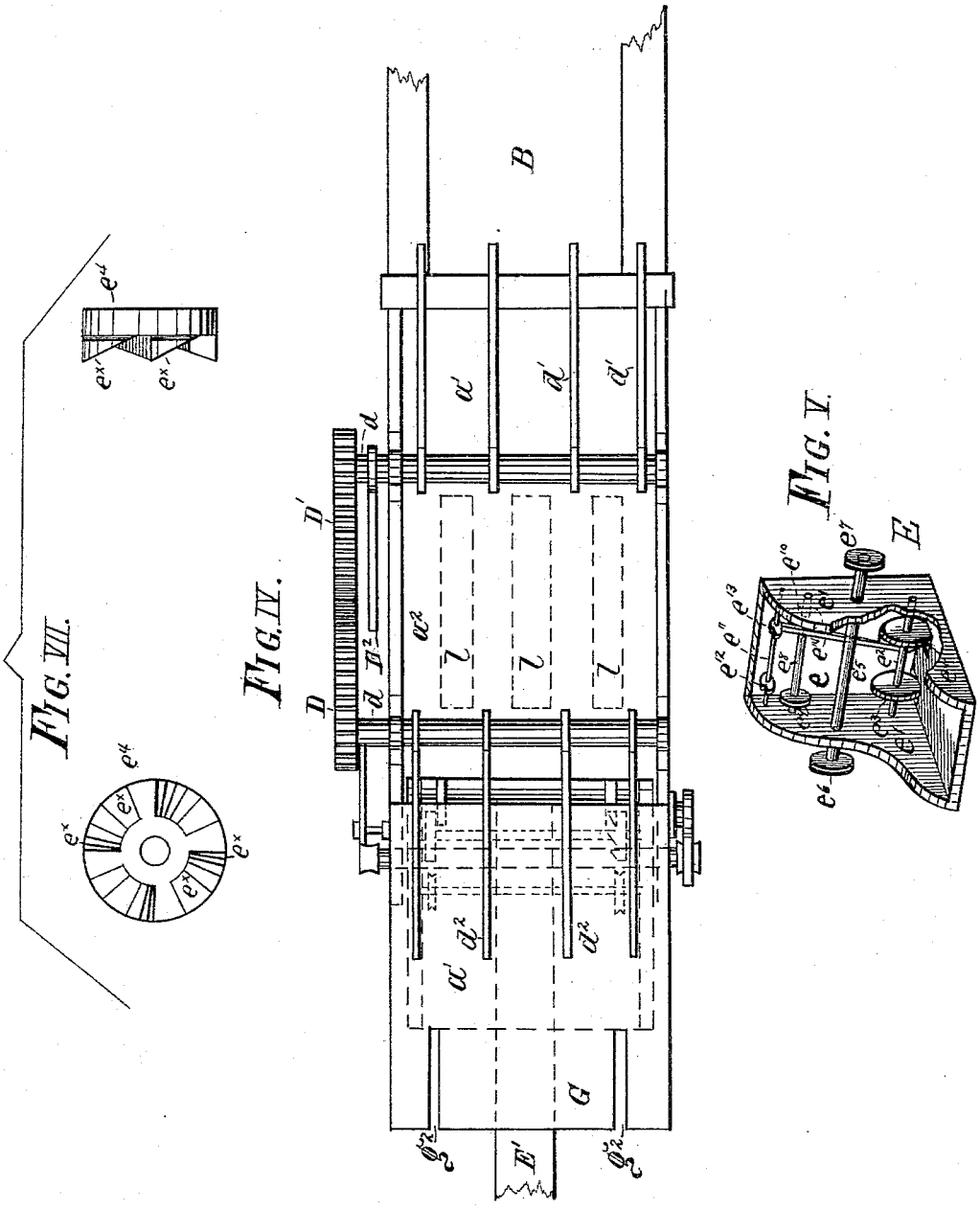

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UNITED STATES PATENT OFFICE.

EPHRAIM C. SOOY, OF KANSAS CITY, MISSOURI.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 384,294, dated June 12, 1888.

Application filed March 29, 1887. Serial No. 232,913. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM C. SOOY, of Kansas City, in the county of Jackson and State of Missouri, 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, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention has for its object to provide for a baling-press auxiliary means for compressing loose hay or other baling material into a compact form or bundle preparatory to its deposit in the press and forcing the said bundle into the receptacle for the material to be baled of the press in advance of the plunger or at the time the plunger has been withdrawn the full limit of play in a direction away from the baling-chamber, so that in each return-stroke of the plunger larger quantities of the hay or other material will be forced into the baling-chamber than heretofore, economizing not only the time of an attendant, but in the field expediting the process of baling and infolding more perfectly the loose ends of the material, such as hay in the layers composing the bales.

In the drawings, Figure 1 is a side elevation of a baling-press, showing the receptacle for the material to be baled therein, the recoiling-plunger, a portion of the baling-chamber and its auxiliary compressing devices and receiving-chamber attached to the receptacle in position to receive the material to be baled, and the plunger in a retracted position. Fig. 2 is a side elevation of the baling-press as seen in Fig. 1, showing the respective positions taken of the plunger, operating-lever, weight and arms, and the sliding plate at a moment before the rebound of the plunger. Fig. 3 is an end elevation, partly in section, on line *y y* of Fig. 1. Fig. 4 is a plan view of the press with the roof of the receiving-chamber removed, showing in dotted lines the slotted weight. Fig. 5 is a perspective rear view of the plunger. Fig. 6 is a detail plan view of the receiving-chamber, showing the opening in the roof for the weight and the portions of the roof in broken lines. Fig. 7 represents a front and side view in detail of the cam-roller.

In carrying my invention into practice I construct, for the hay-receptacle A of a baling-press, which receives the plunger and has a feed-opening in the top to receive the material to be baled and communicates at one end with the baling-chamber B, the frame C, forming the receiving-chamber of the press, the sides of which frame rest upon and extend vertically above the longitudinal sides of the hay-receptacle A a suitable height to receive the hay in bulk, and which sides project a slight distance beyond the opposite ends of the said receptacle, and are provided with inclosing ends c' and roof c^2.

On one side of the frame C, extending from the top downwardly, a portion, c^x, of the side c of the frame C is removed and attached in a horizontal relation to said side, forming a platform, c^3, upon which the hay is received and supplied in large quantities to the press. I then mount on the roof c^2 of the receiving-chamber, at a point midway between the opposite ends, the standards c^4 c^4 c^4 c^4, which standards are placed in pairs in opposite relation and on opposite sides of the opening c^5 in the roof c^2, which opening is made the proper dimensions to receive the weight, hereinafter described.

The standards c^4 c^4 are each strengthened by the braces c^6 c^6, which extend from the roof c^2 to said standards. I then connect the upper end portions of said standards with each other by means of the horizontal cross-pieces c^7 c^7. The inner side of each standard c^4 c^4, I then provide with a rabbet or groove, c^8, extending the length of said standards. I then journal in a transverse relation to the chamber C, and in one side c, a slight distance above the lower edge of the said side, one end of each of the opposite parallel rock-shafts d d, the opposite ends projecting through the opposite side c of chamber C, beneath the platform c^3. The said shafts d d are placed at nearly equal distances apart from each other and from the opposite ends c' c' of the frame C, and in a vertical line with the corresponding sides of the opening c^5 in the roof c^2. I then rigidly attach to the shafts d d, within the receiving-

chamber C, at suitable distances apart, a number of rods or arms, d' d' d^2 d^2, sufficient to hold the hay.

The arms d' d^2 extend in a transverse relation from the respective shafts d d in alternate order, so as to clasp together in the rotation of the shafts d d toward the ends c' c' of the frame C and in their normal condition rest upon the portions a' a' of the top of the hay-receptacle, and near said ends are bent upwardly at right angles and parallel with said ends and terminate near the opening c^x in the side of the receiving-chamber C. The shafts d d extend beyond the outer side of the frame C a short distance on one side, and upon the same side of the frame C and the press I attach to the ends of the shafts d d, the arms being in the position described, the gear-segments D D', which are made of the proper size to mesh with each other above the plane of the lower edge of the said receiving-chamber C, where the arms are in the same position. I then introduce within the end of the hay-receptacle A the plunger E, which is made with a vertical smooth face-plate, e, and side plates, e' e'. In the lower portion of the plunger E, in a transverse relation thereto, and toward the front plate, e, I introduce a shaft, e^2, the ends of which extend part way through the sides of said plates and rotate in the bearings made therefor. Upon said shaft I rigidly attach the roller e^3 and cam-faced roller e^4, which elevate the plunger E so as to be propelled to and fro thereon.

In the sides, extending nearly the length of the hay-receptacle A and midway its height, I make the longitudinal slots a a. I then extend transversely through the sides e' e' of the plunger E a shaft, e^5, and extend said shaft through the slots a a in the sides of the hay-receptacle A, and upon opposite ends of the said shaft, on opposite sides of the press, I attach loosely the rollers e^6 e^7, which rotate on the shaft e^5.

Upon the shaft d carrying the gear-segment D', which is nearest the baling-chamber, and between said gear and the side of the receiving-chamber C, I rigidly attach a lever D^2, which inclines downwardly at an oblique angle to the plane of the lower edge of the receiving-chamber C and in the path of the roller e^6 on shaft e^5 as the plunger E moves toward the baling-chamber B.

Upon the opposite side of the hay-receptacle A to that having the roller e^6, and near the end of the said receptacle in the direction of the power, a slight distance below the slot, I pivotally attach the curved end of a lever, F, which lever extends in height approximately to that of the ends of the arms within the receiving-chamber, and also to the length of the slot a in the side of the receptacle A, and is in the path of the roller e^7 on the end of the shaft e^5 when said plunger moves toward the baling-chamber B, and is depressed by said roller, for the purpose hereinafter described.

The sides c c of the frame C are made to overlap the sides of the hay-receptacle A, and upon the opposite inner longitudinal edges of the said sides c c, I make therein a rabbet, c^9, which extends to a point near the baling-chamber and a slight distance above the upper edges of the sides of the said hay-receptacle. I then make an automatic sliding plate, G, to extend across the top of the hay-receptacle A and fit within the rabbets c^9 c^9, and in length sufficient to close the opening a^2 in the top of the hay-receptacle A, or the distance from the center of one to the center of an opposite shaft d d, the portions of the top of said receptacle A between the shafts d d and the ends of the chamber C having a covering, a' a'.

For the purpose of sliding the plate G in the grooves in a temporary position between the shafts d d, I journal in the upper portion of the plunger E, in a transverse relation, a shaft, e^8, and upon said shaft I place the grooved rollers e^9 e^{10}.

Upon the end of the frame C in the direction toward the power I attach to the said end at the bottom the horizontal supports H H in pairs, and to the said end, and between the respective pairs of the supports, I pivotally attach the pulleys h h. Directly above supports H H, and near the top of the frame C to the same end c', I attach in a similar relation the horizontal supports I I, which are also placed upon and project beyond the end of the frame C, and which supports I I are braced from beneath. Upon said supports I I are mounted the vertical posts i i, upon and between which are journaled at right angles to the support I the grooved pulleys i' i'. To the rear end portion of the plate G beneath is then attached the ropes g g', which are passed over the grooved pulleys e^9 e^{10} on the plunger E, and thence back and over the outer side portion of the grooved pulleys h h, thence over the pulleys i' i' and between said pulleys and attached to a weight, K. In the plate G on the end are made two parallel slots, g^2 g^2, for the passage of the ropes g g'. Upon the plunger E, a slight distance above and between the shaft e^8 and the front plate, e, near the top of said plunger, I pivotally attach a rod, e^{11}, which extends in a transverse relation from one to an opposite side plate, e' e'. Upon said rod e^{11}, I rigidly attach, at suitable distances apart, the dogs e^{12} e^{13}, the ends of said dogs extending rearwardly in the direction from which the power is received and placed on said rod so as to lie horizontally in the plane of the top portion of the plunger, and when elevated at one end will project upwardly in the path of the sliding plate G, and against which the plate G will impinge, as more fully described.

To one of the dogs, e^{13}, I rigidly attach one end of a lever, e^{14}, which spring-lever extends downwardly to a point on a line of the shaft e^2 and against the side of the cam-faced roller e^4. The cams e^x on the side of the roller e^4 are made by cutting a gradual depression or steps in the side of the roller near the periphery and a slight distance toward the axis radially. The normal position of the end of the

said spring-lever e^{14} is against the shaft e^2, and to keep the same in the rebounding of the plunger and the retrograde movement of the cam-roller e^4 in said position I attach to said lever, above the roller e^4, one end of a coiled spring, e^{15}, the opposite end being connected to the side of the plunger E a suitable distance in rear of the face-plate e, toward the opposite end of the plunger, so as to give the proper tension to the spring and keep the lever adjustably in place against the said shaft. The spring-lever e^{14} is sufficiently elastic to move sidewise to and from the cam-roller e^4, and when the plunger moves toward the baling-chamber B the lever, being between two cams, e^x e^x, against the shaft e^2, is given this described movement, first: the direct or right angle portion of the cams throws the lever e^{14} toward the periphery of the roller, and this throws the dogs e^{12} e^{13} in a plane horizontal with the top of the plunger, and, second, when the plunger moves away from the baling-chamber B the lever e^{14} rides on the inclines of the cams successively, and is given a vibratory lateral movement, the dogs being elevated and the lever e^{14} tending to fall against the side of the roller as each cam throws the lever in a lateral direction. I then make a weight to slide between the standards c^4 c^4, which is nearly of the dimensions of the opening in the top of the receiving-chamber C, and of a sufficient length to reach within the receiving-chamber and force the material to be baled the requisite distance from between the compressing-arms. For this purpose I make in the weight L, at suitable distances apart, longitudinal slots l l l of such a width as to enable the portions of the weight on each side of the slots to pass between the arms d' d^2. I then upon the cross-pieces c^7, above the standards c^4 c^4, in a diagonal relation to the said cross-pieces, secure the vertical short uprights c^{10} c^{10}, and between said uprights I place the pulley c^{11}. Upon the roof C^2 of the receiving-chamber C, and near the edge of said roof upon the side of the press carrying the lever F, I place a journal-box, c^{13}, and in said box I introduce a shaft, c^{14}, and upon the end of said shaft which projects beyond the vertical plane of the side of the receiving-chamber C a pulley, c^{15}. To the upper end of weight L, I then attach a spring, l'. I then connect with the spring l', on the top of the weight L, one end of a cable, c^{16}, and extend said cable over pulley c^{15} in the direction of the end of the receiving-chamber and connect the opposite end with the upper end of the lever F.

It will be observed that a reciprocal movement is given to the pitman E' and plunger in the hay-receptacle A, the plunger approaching at each forward movement the opening in the baling-chamber B. The hay from the stack or in the field is then dumped on the platform c^3 and into the receiving-chamber C in bulk, the hay falling in the arms d' d^2, which are in the open position, as seen in Fig. 1 of the drawings, and resting on the bottom of the receiving-chamber C. The automatic sliding plate G is then thrust to one side of the opening in the bottom of the receiving-chamber, through which the hay passes to the hay-receptacle A and held by the dogs c^{12} e^{13}. Power is then applied to the said pitman E', the plunger E carried forward in the direction of the baling-chamber B, and in this movement the cam-roller e^4 as it turns forces the end of the lever e^{14} to its periphery. This movement of the lever e^{14} depresses the ends of and disengages the dogs e^{12} e^{13} from the plate G, the result being that the plate G is permitted to be thrust automatically over the top of the plunger E and close the opening in the top of the baling-chamber. The moment the plunger moves forward toward the baling-chamber B the dogs e^{12} e^{13} release the plate G and said plate shoots forward in advance of the plunger and closes the feed-opening between the chamber C and the hay-receptacle A, as seen in dotted lines, Fig. 1. The hay or other material to be baled, which is thrown loosely into the receiving-chamber, falls between the arms d' d', and is prevented from falling into the receptacle A by means of the said plate G, which retains the material until the plunger rebounds and the arms d' d' have compressed the material into a compact mass.

In the forward movement of the plunger the weight L is raised upward, and upon the rebound of the plunger and before the arms d' d' have unclasped the weight descends and forces the bundle or mass through the feed-opening or passage-way, which is uncovered upon the rebound of the plunger, and which plunger withdraws the plate. The position of the plunger, as seen in Fig. 1, is at the end of a rebound or stroke in its recoil toward the power, and the plate G has been carried back past the opening in the receiving-chamber and held for a moment until the opposite movement of the plunger and the cam-roller forces the lever to the periphery of the roller, releasing the plate. At the moment the plunger moves toward the feed-opening in the baling-chamber B the plate G shoots forward in advance of the plunger by means of the motor described, and closes the feed-opening in the receiving-chamber. The roller e^7 then forces or rides against the lever F, carrying said lever in a downward direction and causing said weight to rise.

Upon the opposite side of the press the roller e^6 meets the lower end of the lever D^2, whereby the shafts d d are rotated, and by means of the gears D D' the arms on both sides of the receiving-chamber are uplifted and clasped together, and the hay compressed within the arms in the form of a bundle. At this end of the stroke the plunger is near the baling-chamber B, as seen in Fig. 2. A backward movement of the plunger communicates a retrograde movement to the cam-roller e^4, which throws the end of the lever e^{14} inwardly toward the shaft of the said roller and elevates the dogs e^{12} e^{13}, which come in contact

with the end of the plate G and thrust said plate to one side of the opening between the chamber C and the hay receptacle A.

To carry the arms d' d^2 back upon the bottom of the receiving-chamber C, I then attach to the side of the gear-segment D' and the outer side of the receiving-chamber the respective opposite ends of a coiled spring, d^3, which extends in an upward direction from said gear. Before the arms d' d^2 have time to unclasp the weight L then descending forces down the bundle of hay from between the arms and into the hay-receptacle A, the lever F rising into a horizontal position as the plunger recedes from the baling-chamber B, the spring l' permitting the weight L to descend into the chamber a short distance and recoil above the plane of the plate G before said plate has closed the opening.

For the purpose of locking the gear-segments D D' at the time the arms d' d^2 are in a clasped position and the said segments are in a position below the plane of the horizontal plate G, I attach to the outer side of the hay-receptacle A, at a point below and within the radius of the said gear-segments, a pivot, which projects outwardly a sufficient distance from the side of said receptacle A to the inner side of the gear-segment D, and attach to the end of said pivot one end of a latch, M, the opposite end having a curved hook-shaped portion. To the end of said latch, at its pivotal point, I attach a spring, m, which extends at right angles to the latch M downwardly to a point in the plane of the slots a a in the side of the hay-receptacle A and in the path of the shaft e^5. Upon the inner side of the gear-segments D is placed a pin, d^4, in such a manner that when the gear-segments are below the plane of the plate G the said latch M will engage with said pin. As soon as the hay is compressed by the arms d' d^2, the segments are carried below the plane of the plate G, and the curved portion of the hooked end of the latch M strikes against, lifts up, and engages automatically with the pin d^4 on the gear-segment D, and prevents the gear-segments from changing position until the plunger moves forward. To keep the latch M in a normal horizontal position, I attach to the side of the hay-receptacle the pin m', which extends outwardly beneath the said latch so far as to permit the latch to rest thereon. The shaft e^5 on the plunger E upon the recoil of the plunger meets the said spring m, which, though flexible to yield and permit the shaft to pass by the end of the said spring, is sufficiently inflexible or rigid to elevate the latch M upon the forward movement of the plunger toward the baling-chamber B.

The bundle of hay which is dumped or forced into the hay-receptacle A is compressed into one-third of the original space, and thus larger charges of hay are enabled to be fed to the hay-receptacle A. Finer material than hay will be compressed by the arms so as to be self dumped by said arms, such as hair.

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

1. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening, of a reciprocating plunger, feed-compressing clamps over said feed-opening, and an intermediate recoiling-weight actuated by said reciprocating plunger, for the purpose described.

2. In a baling-press, the combination, with the baling-chamber, of the receptacle for the material to be baled, in communication therewith, having a suitable feed-opening, a reciprocating plunger in said receptacle, feed-clamps upon said press upon opposite sides of said feed-opening, a recoiling-weight extending into said feed-opening between the said plunger when retracted and the baling-chamber, and a suitable lever operated by said plunger to raise said weight, for the purpose specified.

3. In a baling-press, the combination, with the receptacle for the material to be baled, having a feed-opening for the said material, of a plunger, transverse rock-shafts geared together upon opposite sides of said feed-opening and provided with arms arranged in a clasping relation, and a lever for operating said shafts, as shown and described.

4. In a baling-press, the combination, with the receptacle for the material to be baled, having a feed-opening for the said material, of a plunger, transverse rock-shafts upon opposite sides of said feed-opening, provided with arms arranged in a clasping relation, opposite meshing-gear on said shafts, and a lever operating said shafts and lying in the path of the said plunger, for the purpose described.

5. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening and with longitudinal slots, of a plunger in said receptacle, transverse rocking shafts upon opposite sides of said feed-opening, provided with arms arranged in a clasping relation, opposite meshing-gear on said shafts, a lever on one of said shafts, and a shaft on said plunger extending through said slots in said receptacle and contacting with the said lever, for the purpose described.

6. In a baling-press, the combination, with the receptacle for the material to be baled, having a longitudinal slot in its side and a feed-opening, of a plunger therein, transverse rocking shafts on said receptacle upon opposite sides of said feed-opening and provided with arms arranged in a clasping relation, opposite meshing-gear on said shafts, a lever on one of said shafts, a shaft on said plunger, provided with anti-friction devices extending through said slot in said receptacle and in the path of said lever, a latch on the side of said receptacle, having a flexible end portion lying

in the path of and actuated by the said shaft on said plunger, a projection on one of said gears engaging with said latch, and a spring for disengaging said arms, as shown and described.

7. In a baling-press, the combination, with the receptacle for the material to be baled, provided with longitudinal slots and a feed-opening, of a plunger, anti-friction devices on opposite sides of said plunger extending through said slots in said receptacle, a receiving-chamber above said receptacle, provided with an opening, transverse rock-shafts on said press on opposite sides of said feed-opening and provided with arms arranged in a clasping relation, opposite meshing-gear on said shafts, a lever on one of said shafts lying in the path of said anti-friction devices, a latch on the side of said receptacle, having a flexible end portion lying in the path of and actuated by said anti-friction devices on said plunger, a projection on said gear engaging with said latch, a spring connected with the meshing-gear and to the said receiving-chamber, suitable standards upon said receiving-chamber on opposite sides of said opening, a pulley on said standards and another on the side of said receiving-chamber, a lever pivotally attached at one end to the side of the said receptacle opposite to that provided with the said gear and lying in the paths of the said anti-friction devices on said plunger, a weight between and guided by the standards on said receiving-chamber and extending into the said chamber, a spring attached to said weight, and a cable attached to the said spring at one end and extending over the said pulleys on the said standards and the said chamber, and connected to the upper end of the said lever on the side of said receptacle, for the purpose specified.

8. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening, of a recoiling-plunger in said receptacle, an automatically-sliding plate adapted to cover said opening, a weight on said press, adapted to propel said plate over said feed-opening in one direction, and a dog on said plunger for engaging said plate and moving it in an opposite direction, as described.

9. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening, of a recoiling-plunger in said receptacle, an automatically-sliding plate adapted to cover said feed-opening, a weight on said press adapted to propel said plate over said feed-opening in one direction, a dog on said plunger adapted to move said plate in an opposite direction, a yielding lever connected with said dog, and a traction-roller provided with a tripping-cam in the path of said lever and in the said receptacle, substantially as described.

10. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening, of a recoiling-plunger in said receptacle having traction-rollers, one of which is provided with a cam, a sliding plate adapted to cover said feed-opening, a weight adapted to propel said plate over said feed-opening in one direction, a dog pivotally attached to said plunger and adapted to move said plate in an opposite direction, and a lever connected to said dog at one end and contacting with said cam on one of said rollers at the opposite end, for the purpose described.

11. The combination, in a baling-press, with the hollow plunger provided with the traction-rollers, one of which is provided with a cam, of a transverse rock-shaft journaled in the upper end of said plunger, dogs fixed on said rock-shaft and projecting above the plane of the top of said plunger, and a lever connected with said rock-shaft and said dogs at one end and contacting with the cam on one of said rollers at the opposite end, for the purpose specified.

12. In a baling-press, the combination, with the receptacle for the material to be baled, provided with a feed-opening, of a recoiling plunger in said receptacle having anti-friction devices, an auxiliary receiving-chamber attached to and above said receptacle and provided with an opening registering with said feed-opening, stationary supports on the end of said chamber and pulleys on said supports, a sliding plate adapted to cover said opening between said chamber and said receptacle and provided with longitudinal slots, a cable attached to said plate at its rear end and extending through said slots in said plate and over said anti-friction devices on said plunger, and also over the said pulleys at the end of the said receiving-chamber, and a weight at the end of said cable, as shown and described.

13. In a baling-press, the combination, with the receptacle for the material to be baled, having a suitable feed-opening, of a plunger, transverse shafts on said press on opposite sides of said opening and provided with arms arranged in a clasping relation, a weight provided with longitudinal transverse slots, and a suitable elevating-lever connected with said weight, for the purpose described.

14. In a baling-press, the combination, with the receptacle for the material to be baled, having a suitable feed-opening, of a plunger, transverse shafts on said press on opposite sides of said opening and provided with arms arranged in a clasping relation, a weight provided with longitudinal transverse slots, a spring connected to said weight, and a suitable elevating-lever connected with said spring, for the purpose described.

EPHRAIM C. SOOY.

Witnesses:
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S. L. C. HASSON.