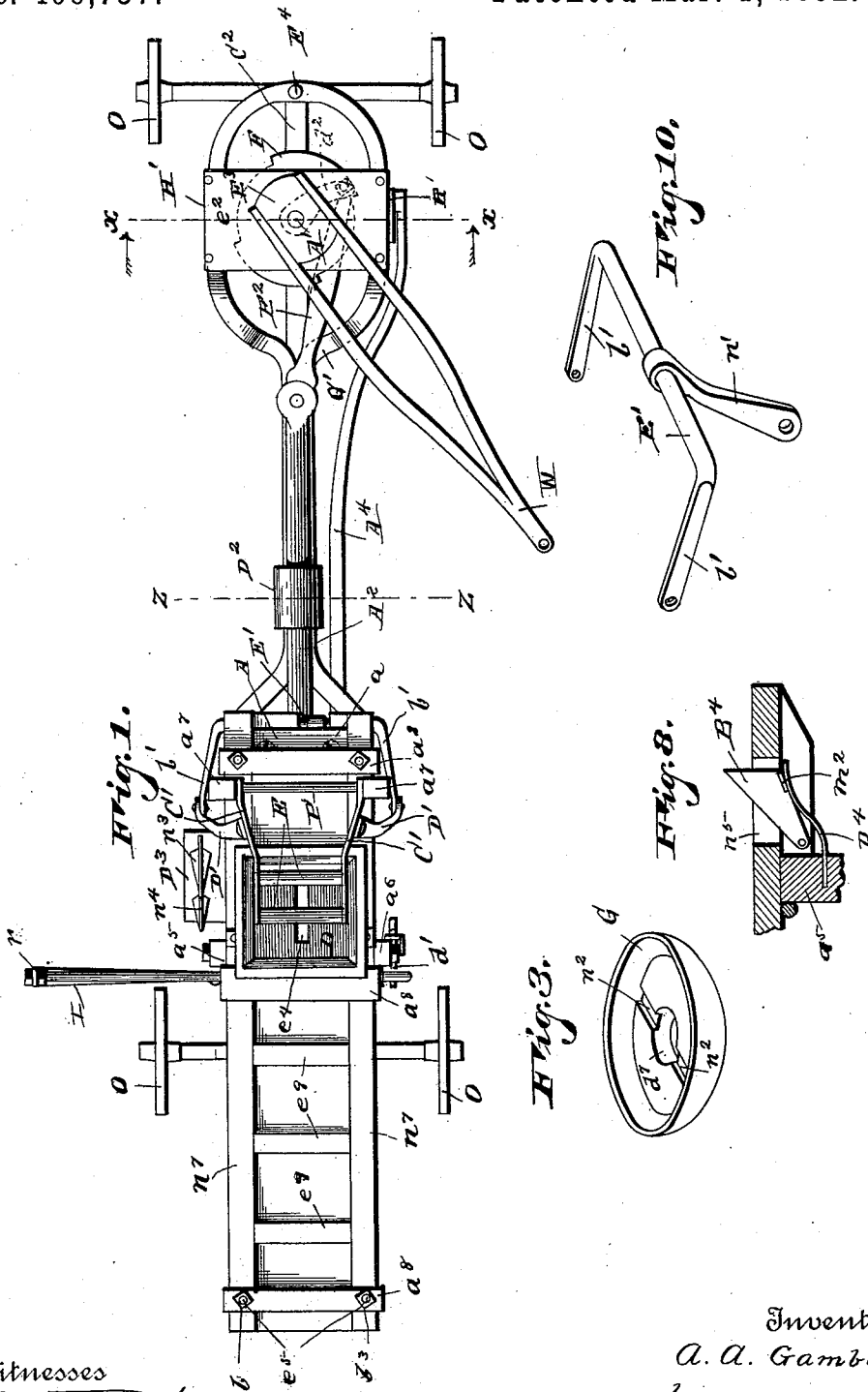


A. A. GAMBLE.
BALING PRESS.

No. 469,737.

Patented Mar. 1, 1892.



Witnesses
Samuel Ker,
Phil Massi

Inventor
 A. A. Gamble
 by *E. W. Anderson,*
 his Attorney

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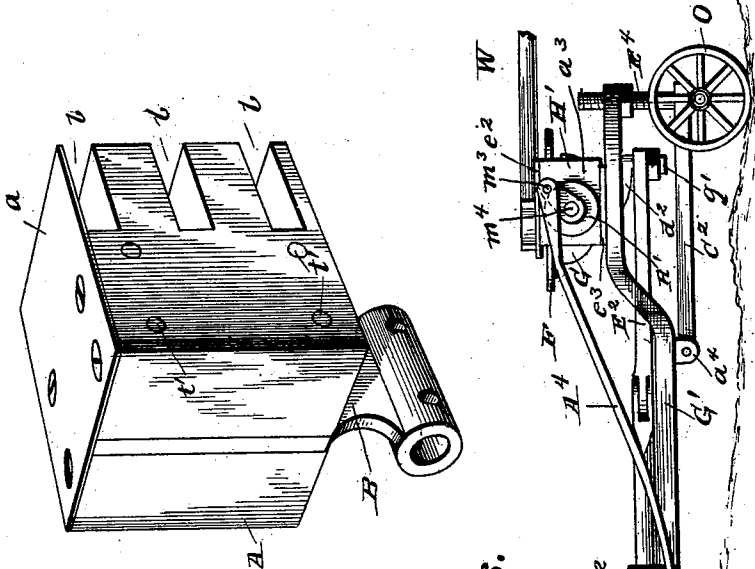


Fig. 7.

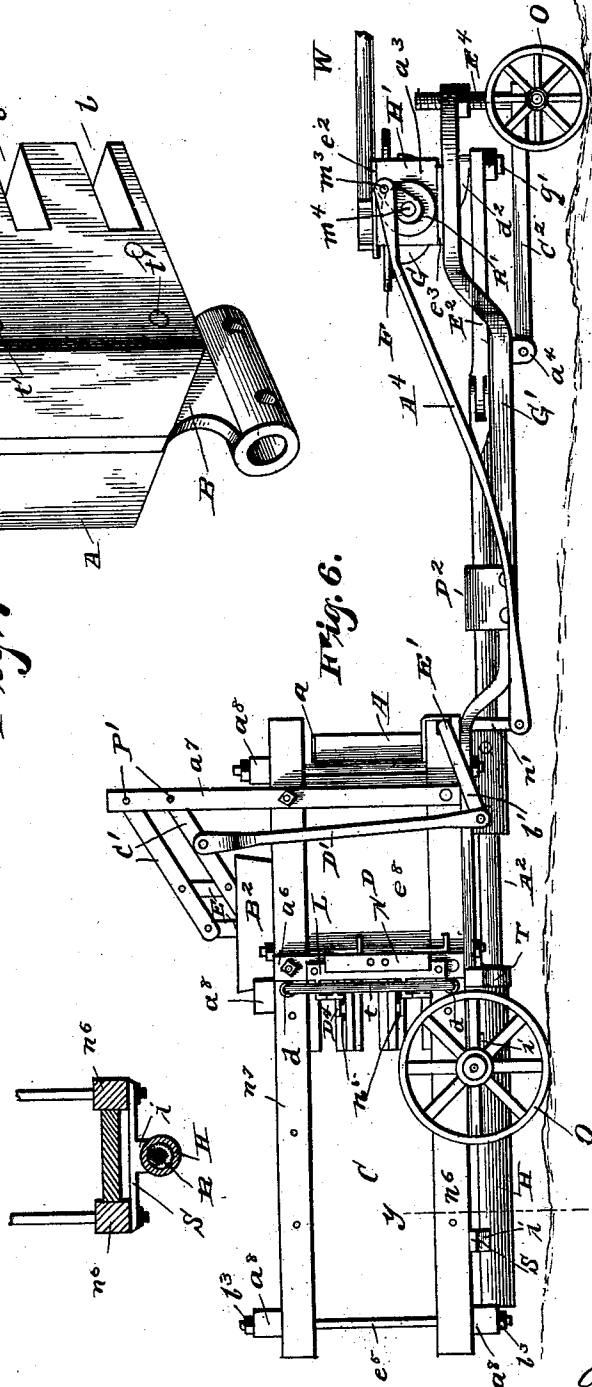
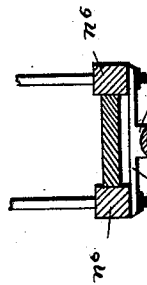


Fig. 6.

Fig. 9.



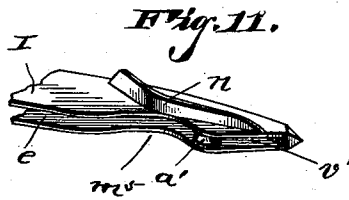
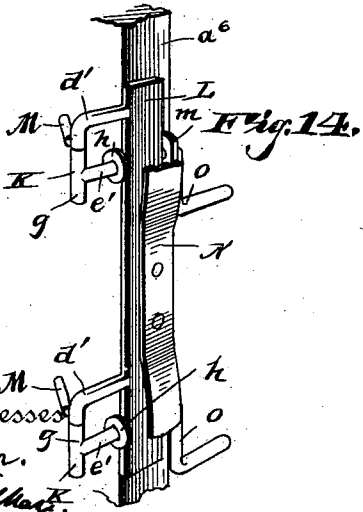
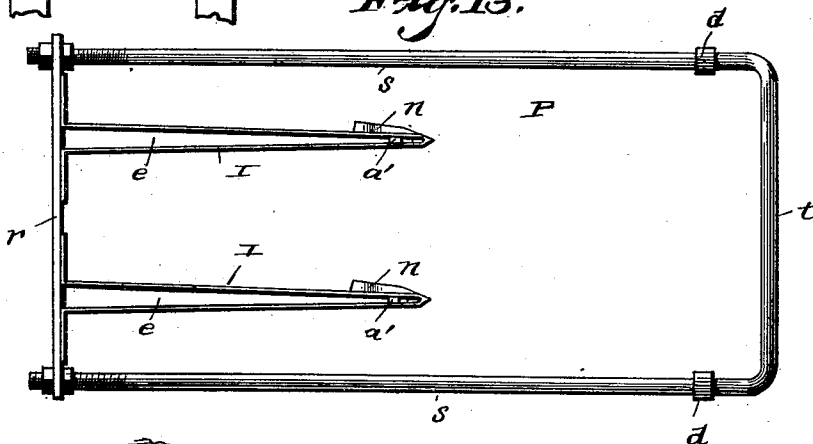
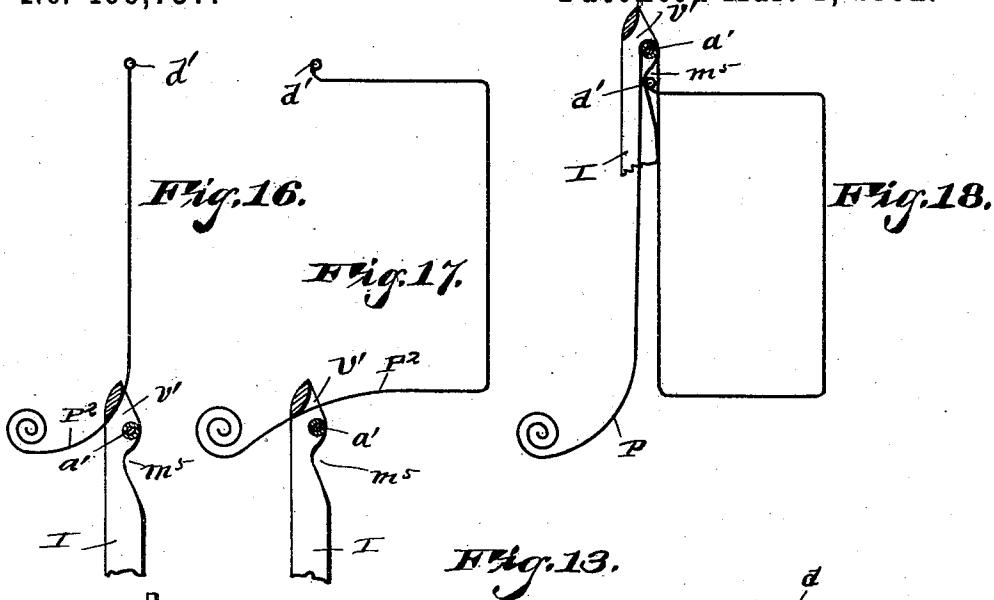
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UNITED STATES PATENT OFFICE.

ALPHONSO A. GAMBLE, OF GRISWOLD, IOWA.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 469,737, dated March 1, 1892.

Application filed December 4, 1890. Serial No. 373,622. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSO A. GAMBLE, a citizen of the United States, residing at the town of Griswold, in the county of Cass and State of Iowa, have invented certain new and useful Improvements in Baling-Presses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in baling-presses; and the object of my improvements is to facilitate the baling of hay, straw, cotton, and other substances.

In the accompanying drawings, Figure 1 is a top plan view of the entire press. Fig. 2 is a vertical cross-section of same, taken on line $x x$, Fig. 1. Fig. 3 is a perspective view of the revolving case. Fig. 4 is a bottom plan view of the gear-wheel carrying the ratchet. Fig. 5 is a detailed view of a portion of the mechanism employed to operate the feeders. Fig. 6 is a side elevation of the entire press. Fig. 7 is a perspective view of the follower. Fig. 8 is a detail, partly in section, showing one of the dogs. Fig. 9 is a detail cross-section of the press, taken on line $y y$, Fig. 6. Fig. 10 is a perspective view of the rock-shaft and arms connected thereto that assist in operating the feeders. Fig. 11 is a detail perspective of one of the needle-points. Fig. 12 is a central vertical longitudinal sectional view of a portion of the press. Fig. 13 is an elevation of the needles and the frame that supports and guides them. Fig. 14 is a perspective view of the device employed in twisting and tying the wire. Fig. 15 is a transverse section on the line $z z$, Fig. 1. Figs. 16, 17, and 18 are conventional views showing the different positions of the needle and wire during the operation of binding.

Similar letters refer to similar parts throughout the several views.

The two longitudinal pieces n^6 , the two longitudinal pieces n^7 , the three top cross-pieces a^8 , the three top cross-pieces e^9 , the bottom cross-piece a^8 , the two cross-bars S, the cross-piece T, the upright pieces a^5 and a^6 , and the

two upright pieces a^7 constitute the frame of the compression and friction chambers.

D is the compression-chamber, which is constructed in the ordinary manner. 55

C is the friction-chamber constructed in the ordinary manner, with the exception that the side board e^8 does not extend the entire length of the friction-chamber, as it commonly does, but is cut off, so that it projects only a few feet beyond the compression-chamber, as shown in Fig. 6. The resistance of the friction-chamber is adjusted by means of rods e^5 , which have their upper ends threaded and fitted with nuts b^3 . By turning the nuts b^3 the distance between the top n^7 and bottom n^6 of the friction-chamber can be adjusted so that the proper resistance can be secured. 60 65

A is the follower having secured to its top the iron plate a . The inner end of the follower has grooves b constructed in such a position and of such size that when the follower is reciprocated it will straddle the needles if the latter are extended across the press. 70

H is a tube closed at its rear end and containing a spiral spring R. It is firmly secured to the cross-bars S by means of lugs i . 75

A^2 is a reciprocating rod, which loosely enters the forward end of the tube H and rests against the forward end of the spiral spring R. It passes loosely through an aperture in the middle portion of the cross-piece T. The follower A is connected to the reciprocating rod A^2 by means of the plate B, which at its lower end encircles the rod and is firmly secured thereto by rivets, and which projects from the rod upward through a slot e^4 in the bottom of the compression-chamber into a slit adapted to receive it in the middle of the follower and is firmly secured to the follower by means of cross-bolts t' . The slot e^4 is made of suitable size to permit the plate B to freely reciprocate therein. 80 85 90

In the upper side of the compression-chamber is the opening A^3 , which is surrounded by the hopper B^2 . 95

G' is a frame that supports the power-frame and connects it to the compression-chamber frame. It is bifurcated at its rear end and bolted to the under side of the pieces n^6 . Its forward end is bow-shaped. 100

H' is a frame that supports the power and

is composed of the top piece e^2 , the bottom piece e^3 , the end piece a^2 , and the end piece a^3 . It rests upon and is firmly secured to the frame G' .

5 E^3 is a thimble secured at its upper end to the inner end of the sweep W . It passes loosely through an aperture in the piece e^2 , and is firmly secured to the gear-wheel F , through which it projects. The periphery of the gear-wheel F is reduced on two opposite sections, each section being equal to about 10 one-fourth the circumference of the wheel, and the periphery of the reduced sections is provided with teeth d^3 , which extend down- 15 ward from the wheel and engage with the teeth of the wheel B^3 .

B' is a pawl hinged to the under side of the wheel F .

20 A' is the crank-shaft, the upper end of which extends loosely through the thimble E^3 . It projects loosely through the aperture d^4 in the piece e^3 . Its central portion is enlarged, forming shoulders d^5 and d^6 . The shoulder d^6 rests upon the boss b^2 , and upon the shoulder d^5 rests the lower end of the thimble E^3 . 25 The lower part of the crank-shaft is bent, forming the crank-arm d^2 , which is provided with the crank-pin g' .

30 G is a revolving case, dish-shaped and open at its top. It is firmly secured at its bottom to the enlarged portion of the crank-shaft, which passes snugly through the aperture d^7 . Its bottom is provided with two cavities n^2 for the reception of the free end of the pawl 35 B' . The cavities are located opposite of each other.

B^3 is a bevel-gear which engages with the teeth d^3 of the wheel F . It is provided at its outer end with the projection or stop v .

40 R' is a crank-wheel provided with the crank-pin m^3 . The shaft m^4 is fixed in a bearing in the end piece a^3 and has firmly secured to its outer end the crank-wheel R' and to its inner end the gear-wheel B^3 .

45 E^2 is a link which is hinged at one end to the end of the rod A^2 and pivotally connected at the other end to the outer end of the crank-arm d^2 , by means of the crank-pin g' .

50 D^2 is a collar which is secured to the frame G' and passes over the rod A^2 .

55 C^2 is a hinged connection which joins the frame G' to the axle H^2 . It is hinged at its rear end to the under side of the frame G' by means of the ears a^4 , and is pivotally connected at its forward end to the axle H^2 . It is located under the frame G' and is of corresponding size and shape to that portion of the frame G' which extends forward from the ears a^4 .

60 E^4 is a screw which fits a threaded aperture in the front end of the frame G' . Its lower end rests on the upper side of the connection C^2 . By means of this screw the frame G' can be moved to and from the connection C^2 and its distance from the ground adjusted. 65 The rock-shaft E' is fixed in bearings in the forward ends of the pieces n^6 . It is provided

with the downwardly-projecting arm n' and the two laterally-projecting arms b' .

70 A^4 is a rod pivotally connected at its forward end to the crank-wheel R' by means of the crank-pin m^3 and at its rear end to the lower end of the rock-shaft arm n' .

75 E are feeders which are pivotally connected to the supporting-arms C' . The four arms C' , there being two on each side of the feeders, are pivotally connected with the upright pieces a^7 , which project above the compression-chamber by means of two cross-rods P' . The two bars D' are pivotally secured one on 80 each side of the compression-chamber at their upper ends to the lower arms C' and at their lower ends to the ends of the rock-shaft arms b' . The plate D^3 is screwed to the under side of the piece n^6 , and is provided with the up- 85 wardly-projecting wire-holders n^3 and n^4 . The four dogs B^4 , there being two on each side of the press, are hinged at their narrowest ends to the side boards e^8 next to the slots n^5 , through which their free ends work. The 90 two upper dogs have extending upward the projections m^2 and the two lower dogs have similar projections extending downward.

95 D^4 are springs firmly secured at one end to the boards e^8 and having their free ends resting against the projections m^2 of the dogs.

100 P is the needle-frame, composed of the end piece r , the two side pieces s , and the end piece t . The end piece t can be made integral with the side pieces s . The side pieces are provided with ledges d . The upper side 105 piece s slides loosely through apertures adapted to receive it in the pieces n^7 and the lower side piece s slides through similar apertures in the pieces n^6 .

110 I are needles which are firmly secured at their outer ends to the piece r of the frame P . They are each provided with a slot e , and each has near its point a pin a' , fixed within the slot, and a notch m^5 , located just to the rear of the pin a' , and a bent guide n , projecting upward from the top side of the needle, and an eye v' in its point.

K' is a bale of hay.

115 K^2 is compressed hay of sufficient quantity to constitute a bale, nearly surrounded by wire.

120 K^3 is compressed hay of insufficient quantity to form a bale, having wire on three sides only.

P^2 is the wire employed to bind the bales.

125 L is a plate firmly secured to the outer side of the upright piece a^6 and provided with hooks d' , which project therefrom.

130 K are the twistors, each being composed of a shaft e' , fixed in a bearing in the plate L and provided with ledges h and m , the crank o , secured to one end of the shaft, and the cross-head g , secured to the other end.

135 N is a spring secured at its middle to the plate L and having its ends bearing upon the ledges m of the shaft e' .

M are pins which project from the upright piece a^6 and slant outwardly therefrom, and

when the needles are extended across and through the press the pointed end of each needle is located under the pin M next to it in such a position that the extreme end of the pin bears against that side of the guide n next to the upright piece a^6 .

The gear-wheels F and B³ are so adjusted that when the feeders E are elevated to their highest position the follower A is located under the opening A³ and closes the same, and the stop v projects upward from the wheel B³ and bears against a toothless section of the periphery of the wheel F and checks the revolution of the wheel B³ until a toothed section of the wheel F comes in contact with the teeth of the wheel B³, when the follower moves outward and the feeders downward through the opening A³; but as long as the revolution of the wheel B³ is checked by the stop v the feeders remain elevated. It is evident that if the sweep w be revolved in the direction that the arrow points the free end of the pawl B' will enter a cavity n and lock the crank-shaft A' to the sweep and that the follower A will be moved inward by the power applied to the sweep and outward by the rebound of the substance that is being pressed and by the spiral spring R pressing against the end of the rod A², and that the follower will be reciprocated twice to one revolution of the sweep. This is caused by the arrangement of teeth on the gear-wheel F.

The press is fed by placing the substance to be pressed in the hopper B², when the feeders are elevated and the aperture A³ is closed by the follower, and as soon as the follower has moved outward sufficiently to open the aperture A³ the feeders descend and force the contents of the hopper into the compression-chamber in front of the follower.

For convenience in moving the press is mounted upon wheels O, and when it is desired to transport it from place to place the screw E⁴ is turned in as far as possible, as shown in Fig. 6, for the purpose of raising the frame G' a suitable distance from the ground for moving; but before the press is operated the screw is turned out and the frame G' lowered, so that horses attached to the end of the sweep can readily pass over the frame. The needles are drawn through the press by pulling on the end piece t of the needle-frame P, and after passing through the press the pointed ends of the needles pass between the upright piece a^6 and the ends of the hooks d' in such a position that the ends of the pins M come in contact with the guides n and spring the needles, so that the ends of the hooks d' enter the notches m^5 and the upper ends of the cross-heads g of the twisters, when the twisters are turned in such a position that the cross-heads assume a vertical position, enter the notches m^5 below the hooks d' and between the strands of wire carried by the needles, and when the pointed ends of the needles are withdrawn from contact with the hooks d' and twister-heads the wires will be

looped around and held by the hooks and twister cross-heads.

The press is operated as follows: Horses are attached to the outer end of the sweep W and made to travel around in the direction that the arrow points. The rear end of the friction-chamber is then closed by placing an ordinary board against the inner sides of the rods e^5 . The press is then fed until the friction-chamber is packed full of the substance to be pressed. The rear end of the friction-chamber is then opened by removing with a hammer the board which was placed against the rods e^5 . A coil of wire is now placed around each of the wire-holders n^3 and n^4 , and one of the ends of the wire on the holder n^3 is drawn through the eye of the upper needle and extended across and through the press and looped around the upper hook d' , as shown in Fig. 16, and one end of the wire on the holder n^4 is drawn through the eye of the lower needle and passed through the press and looped around the lower hook d' . The twisters are turned so that the cross-heads g assume a vertical position, as shown in Fig. 14. The press is now fed, and with each inward movement of the follower the charge is forced past the dogs into the friction-chamber, and the wires which cross the press are moved toward the rear end of the press and are drawn through the eyes of the needles as each charge is forced into the friction-chamber, as shown in Fig. 17, and when nearly a sufficient quantity of the material that is being pressed to form a bale has been forced against the wires that cross the press the twisters are turned so that their cross-heads assume a horizontal position, and the looped ends of the wires are permitted to drop from the hooks d' , and when a sufficient quantity of the material that is being pressed to form a bale has been forced into the friction-chamber against the cross-wires the needles are drawn through the press, so that their pointed ends pass between the upright a^6 and the ends of the hooks d' , and the hooks d' rest within the notches m^5 . The position of the wire is shown in Fig. 18. The twisters are now turned so that the cross-heads g assume a vertical position and their upper ends enter the notches m^5 and between the strands of wire carried by the needles. The needles are then withdrawn from the press by pushing on the end piece t of the needle-frame, and as the needles are withdrawn the hooks d' and cross-heads g hold the wire, so that when the needles have been entirely withdrawn from across the press double wires cross the press from the end of each needle to each hook d' between the substance that has been compressed and the follower. The press is now fed, and when nearly enough of the material that is being pressed to form another bale has been forced into the friction-chamber against the double wires that cross the press the twisters are revolved, which operation twists the wires and forms loops around the cross-heads g . The loops are then forced by the hands

onto the hooks d' and the twisters turned so that the cross-heads are in a horizontal position. One of the strands of each double wire is now cut off just back of the loop in its end, and the cut strands are tied to the looped ends of the wires which were first extended across the press, which operation ties and binds the first bale.

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

1. The combination, with the frame G' and means for its vertical adjustment with relation to the supporting wheels and frame, of the frame H' , supported thereon, the crank-shaft A' , having the sweep connected thereto and provided with bearings in the frame H' , the dish-shaped case rigidly secured to the crank-shaft and provided with oppositely-located notches, the wheel F , having the reduced segmental or toothed portions, the pawl carried by said wheel and adapted to engage and disengage said notches, and the pinion-and-crank feeder-operating mechanism operated by said reduced segmental portions, substantially as specified.

2. In a baling-press, the needle-frame comprising the side and end portions, one of said end portions carrying a series of needles, each of said needles having a longitudinal slot, a pin within said slot, notches to the rear of said pin, and a guide on its upper side, substantially as specified.

3. In a baling-press, the combination, with the compression-chamber having a longitudinal slot in its bottom and the follower reciprocating in said chamber, of a reciprocating rod or plunger having a connection with said follower through said slot, said rod or plunger having a connection at one end with an actuating-crank and at its opposite end working in a tube or sleeve and having its inner end pressed by a spring confined in said tube or sleeve, and vertically-reciprocating feeders operating alternately with said follower and actuated from the follower-actuating mechanism, substantially as specified.

4. The combination of the compression-chamber, the friction-chamber, the follower, the means for reciprocating the follower, the sliding frame carrying the needles, and the wire-twister secured to the side of the press and having pins operating with the twisters and guides on the needles, substantially as described.

5. In a baling-press, the combination of the following elements, all substantially as described: the needle I , supported by a sliding frame and having near its point the notch m^5 , a guide n , the twister K , hook d' , and pins M .

6. The combination, with the sliding frame and the needles carried thereby, having guides n near their forward ends, of the plate secured to a frame-post, said plate carrying shafts having cross-heads g , the hooks d' , and pins M , said cross-heads, hooks, and pins cooperating with said needles to effect the tying

and twisting of the binding-wires carried by said needles, substantially as specified.

7. In a baling-press, the combination, with the frame, of the following elements composing the device for tying the bale, all substantially as described, consisting of the sliding needle-frame P , the needle I , secured to the needle-frame and having near its point the guide n and notch m^5 , the twister K , the hook d' , and pin M , located so as to have its end come in contact with the guide n .

8. In a baling-press, the combination of the following elements composing the mechanism for operating the feeders, all substantially as described: the wheel F , having the segmental or toothed portion, the sweep connected to said wheel, the wheel B^3 , which engages with the wheel F and has the stop v , the crank-wheel R' , connected by a shaft supported in a suitable bearing to the wheel B^3 , the rod A^4 , which connects the crank-wheel R' to the arm n' of the rock-shaft, the rock-shaft E' , having arms b' , the bars D' , pivotally connected at their lower end to the arms b and at their upper end to the arm C' , and the pivoted arms C' , to which the feeders are pivoted and by which they are supported.

9. In a baling-press, the combination of the following elements composing the mechanism for reciprocating the follower, all substantially as described: the wheel F , carrying the pawl B' , the sweep W , secured to the wheel F , the driving-rod A' , having the crank-arm d^2 , the revolving case G , firmly secured to the driving-rod and having the notches n^2 , the frame H' , the reciprocating rod A^2 , connected by the link E^2 to the crank-arm of the crank-shaft and which plays through and is guided by supports located below the follower, the plate B , connecting the follower to the rod A^2 , and the spiral spring R , which bears against the end of the rod A^2 , and the tube or sleeve confining said spring and in which the free ends of the rod A^2 work.

10. In a baling-press, the combination, with the crank-shaft A' , having the sweep connected thereto and provided with a supporting frame and bearings, and the dish-shaped case rigidly secured thereto and provided with opposite notches, of the wheel F , having the oppositely-reduced segmental toothed portions, and a pawl carried by said wheel and adapted to engage and disengage said notches, and the pinion-and-crank feeder-operating mechanism operated by said reduced segmental portions, substantially as specified.

11. The combination, with a wheel F , having opposite reduced segmental or toothed portions and carrying a pawl adapted to engage and disengage the follower-operating mechanism, of a pinion operated by said wheel, said pinion having a stop v , and a crank-wheel and a connection between said crank-wheel and the feeding mechanism, said parts all arranged so that the feeders and follower are alternately reciprocated and at right angles to each other, substantially as specified.

12. The feeding mechanism comprising the
uprights *a'*, the supporting-arms *C'*, pivotally
connected to said uprights, the feeders proper
pivotally connected to said supporting-arms,
5 the arms *D'*, pivotally connected at their up-
per ends to the lower arms *C'* and at their
lower ends to arms of a rock-shaft, and a con-
nection between said rock-shaft and the fol-
lower-operating mechanism, whereby said

feeders are operated alternately with the re- 10
ciprocation of the follower, substantially as
specified.

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

ALPHONSO A. GAMBLE.

Witnesses:

JAMES JONES,

CLINTON S. FLETCHER.