

(No Model.)

3 Sheets—Sheet 1.

J. W. CARMACK.
HAY PRESS.

No. 512,465.

Patented Jan. 9, 1894.

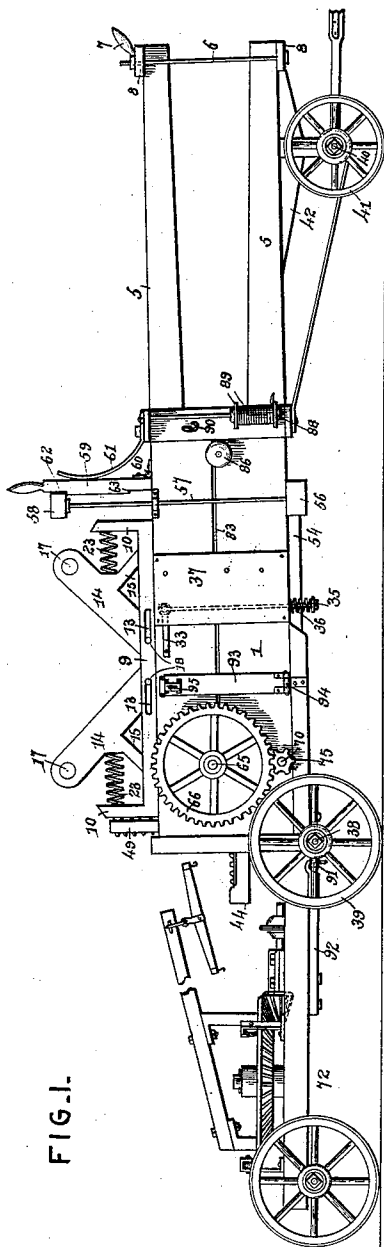


FIG. 1.

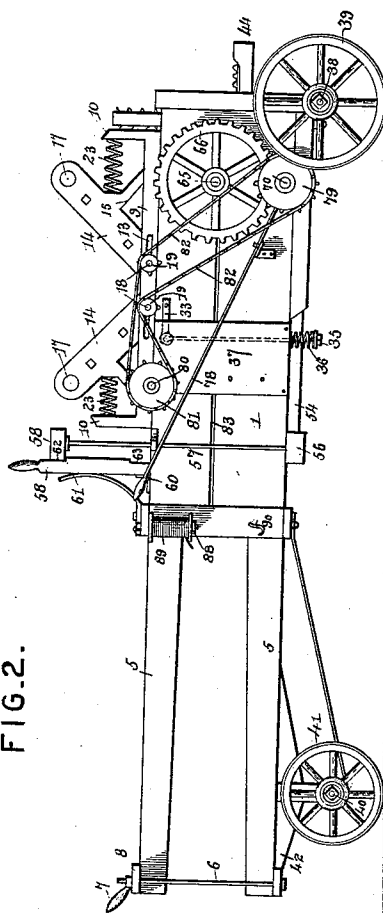


FIG. 2.

Witnesses

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FIG. 3-

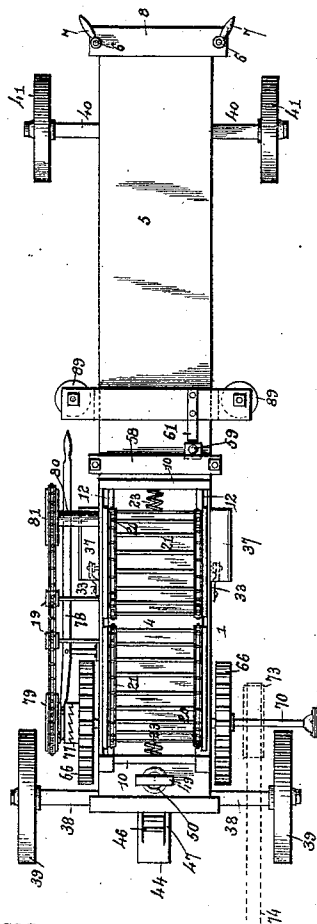


FIG. 11-

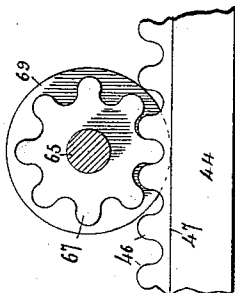
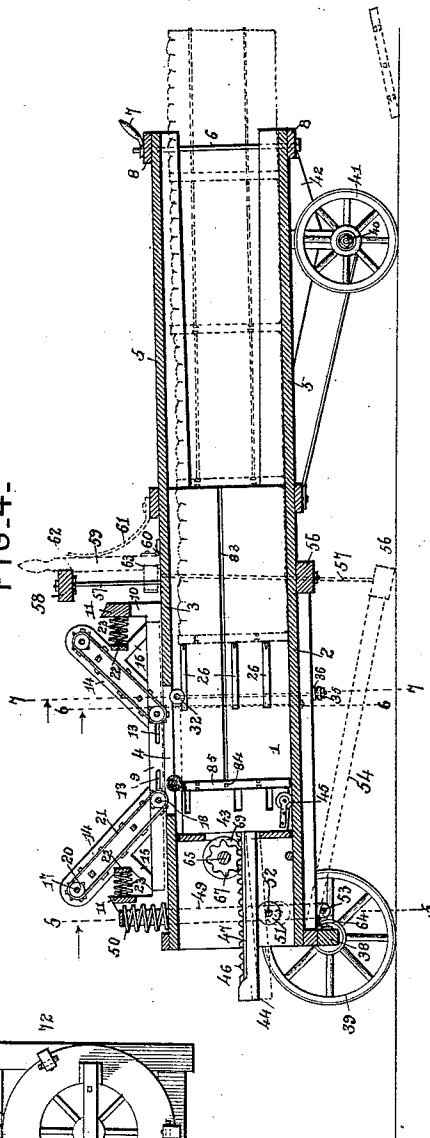


FIG. 4-



Witnesses

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FIG. 7.

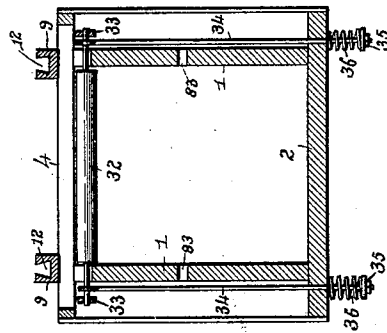


FIG. 10.

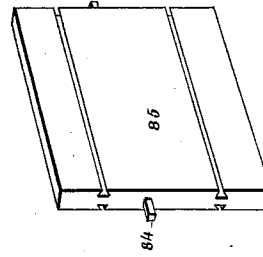


FIG. 6.

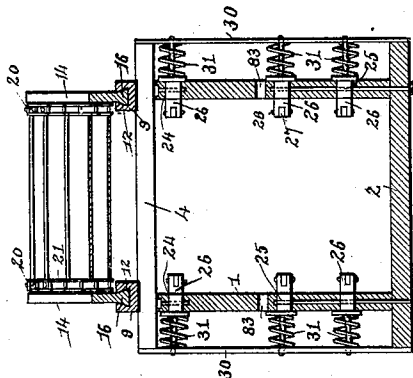


FIG. 9.

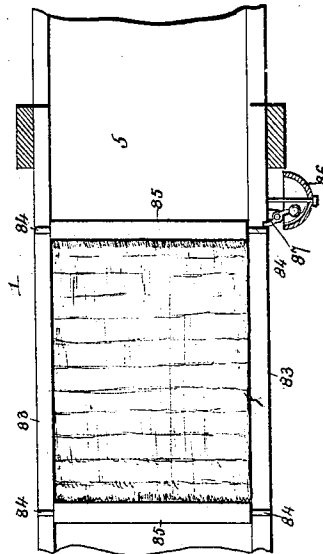


FIG. 5.

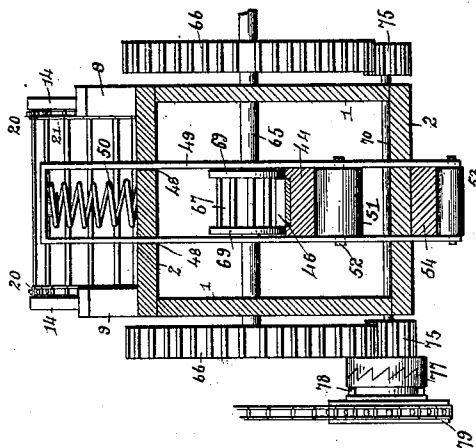
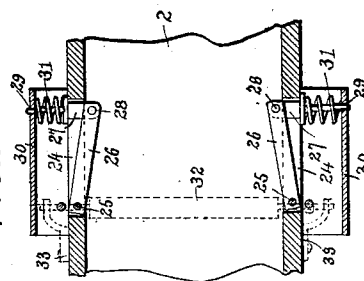


FIG. 8.



Witnesses

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By his Attorneys,

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Inventor

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UNITED STATES PATENT OFFICE.

JOHN W. CARMACK, OF DYERSBURG, TENNESSEE, ASSIGNOR OF ONE-HALF
TO JOHN M. MILLEN, OF SAME PLACE.

HAY-PRESS.

SPECIFICATION forming part of Letters Patent No. 512,465, dated January 9, 1894.

Application filed December 9, 1892. Serial No. 454,627. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. CARMACK, a citizen of the United States, residing at Dyersburg, in the county of Dyer and State of Tennessee, have invented a new and useful Hay-Press, of which the following is a specification.

My invention relates to improvements in hay presses; the objects in view being to provide a cheap and simple press adapted to be readily transported, and for pressing hay, or, if desired, cotton or other stuffs; and to so construct the press as to gradually feed the stuffs to be baled into the feed-chamber, thereof, and to utilize in said press the laws of gravity for returning the plunger to its retracted position.

With these general objects in view, and various other minor objects not necessary to mention, the invention consists in certain features of construction hereinafter specified and particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a side-elevation of a press constructed in accordance with my invention, the same being shown in connection with an ordinary horse-power by which it may be operated, the whole being adapted for transportation. Fig. 2 is a detail of the press in side-elevation the view being taken at that side opposite to that shown in Fig. 1. Fig. 3 is a top-plan view of the press in position for operation. Fig. 4 is a vertical longitudinal sectional-view of the same, the plunger being retracted. Fig. 5 is a transverse vertical sectional-view of the press, the same being taken on the lines 5—5 of Fig. 4. Fig. 6 is a similar view, the section being taken on the lines 6—6 of Fig. 4. Fig. 7 is a similar view, the section being taken on the lines 7—7 of Fig. 4. Fig. 8 is a horizontal section through one of the detents. Fig. 9 is a horizontal section through the press and gong. Fig. 10 is a detail in perspective of one of the separators. Fig. 11 is a detail in elevation of a portion of the plunger stem and the gear for operating the same.

Like numerals of reference indicate like parts in all the figures of the drawings.

In constructing the press-box I provide opposite closed sides 1, a bottom 2 and top 3, the latter being provided between its ends

with a feed-opening 4. The top and bottom of the press extend beyond the rear edges of the side walls to form compressing-jaws 5, and the same are connected at their rear ends by binding-rods 6, provided at their upper ends with tail-nuts 7, and passing through cleats 8 located upon the upper and lower sides of the top and bottom, respectively.

Upon the top of the press and surrounding the opening 4 there is a rectangular metal frame 9, the same being provided at its ends with vertical standards 10 connected by cross-bars 11. The opposite side-bars of the frame 9 are provided with dovetailed grooves 12, best shown in Figs. 6 and 7, and furthermore are provided with slots 13 at each side of the center thereof.

14 designates a pair of inclined carrier-frames, which are embraced at their lower ends by the side-bars of the frame 9, and are provided with braces 15 at their rear sides, whose lower ends terminate in dovetail heads 16 which take into the dovetail grooves of the side-bars of the frame 9. Transverse shafts 17 and 18 are journaled in the side-bars of the carrier-frames, the lower shafts 18 extending through the slots 13 of the frames 9 and beyond the same where they are provided at one side with small sprocket-wheels 19. The shafts 17 and 18 are provided with sprocket-wheels 20, and over the same pass endless carrier-belts 21, which are designed, as will hereinafter be described, to move in unison and thus feed the stuff or material to be baled down through the opening in the top of the press. The side-bars of the carrier-frames are connected at their rear edges by cross-bars 22, and interposed between these and cross-bars 11 are coiled-springs 23, which have a tendency to force the two carrier-frames together at their lower ends, the shafts 18 of the frame passing through the longitudinal slots of the frame 9.

The opposite sides of the press are provided at intervals with slots or openings 24, best shown in Fig. 8 of the drawings, and in each slot is pivoted as at 25, a lever 26. A link 27 is pivoted as at 28 to the free end of said lever and the outer end of the link is reduced and passed through a perforation 29 formed

in a hood or keeper 30, and surrounded by a coiled-spring 31, which bears against the shoulder of the link and consequently forces the lever 26 inwardly. These constitute de-

5 tents for maintaining the hay or other stuffs baled in the forward portion of the chamber and prevent the same from being retracted or drawn back with the retraction of the plunger.

Below the rear edge of the opening 4 in the

10 top of the baling-press is a tucker-roll 32 (see Fig. 4) and the axle of said tucker-roll has bearing in a pair of opposite, pivoted arms 33. (See Figs. 1 and 7.) These arms have their forward ends pivoted to the sides of the box

15 and are pivoted for vertical vibration, in accordance with the motion of the roll. Pairs of rods 34, are loosely connected with the axle of the tucker-roll, and the lower ends of said rods pass through the bottom of the bal-

20 ing-press, and below the same are provided with nuts 35. Coiled-springs 36 are interposed between the nuts and the bottom of the press and serve to normally depress the tucker-roll 32. The rods 34 are preferably located

25 on the outside of the press, and may be covered by cleats 37, best shown in Fig. 1.

38 designates the rear axle, which is provided with the usual ground-wheels 39; and 40 designates the front axle having the

30 ground-wheels 41, the front axle being mounted upon a truck 42, whereby it serves to elevate the front end of the press, and consequently the same declines from front to rear.

43 designates the plunger-head, and 44 the

35 plunger-stem. The plunger-head is mounted upon an anti-friction roller 45, which travels upon the inclined bottom of the press, and consequently when not otherwise influenced the position of the plunger-head is at the rear

40 end of the press. The plunger-stem is provided upon its upper side with a series of "balled-teeth" 46, and at opposite sides of the same with horizontal flanges or tracks 47. Through vertically opposite openings 48,

45 formed in the rear end of the press there is passed a rectangular or oblong stirrup-frame 49, whose upper end extends above the top of the press, and whose lower end extends below the bottom thereof. A coiled-spring

50 50, is interposed between the top of the press and the upper end of the stirrup and serves to normally elevate the same. A roller 51, has its axle 52, journaled in the op-

55 posite sides of the stirrup below the plunger-stem 44. Between the lower terminals or sides of the stirrup 49 there is pivoted at 53, a bar or lever 54, and the same is provided at its free end with a cross-head to which are attached rods 57, whose upper ends extend above

60 the top of the press and connect with a cross-bar 58. A lever 59, is hinged at 60, to the top of the press in rear of the rods 57, and a spring 61, arranged in rear of the lever serves to press the same normally forward. The lever

65 is provided with a notch or recess 62, in its front face, and the same is designed to engage

the front edge of the cross-bar 58 and thereby elevate the same and with it the bar 54. The lever is further provided near its lower end with a recess 63, so that when said bar 58 is depressed and the lever liberated the said re-

70 cess or shoulder 63 will take over the upper edge of the bar 58 thus retaining the same in a lowered position. The rear end of the bar 54, it will be observed, is pivoted to the axle

75 38 of the machine, as indicated at 64, and its connection with the stirrup 49 is in advance of said pivot-point, so that by the upward movement of the bar 54, the stirrup is permitted to rise or be elevated by its spring 50,

80 and by a lowering of said bar 54, the stirrup is drawn down against the tension of its spring, and in its rise and fall carries with it the pulley or roller 51. In opposite bearings formed in the side-walls of the oblong cham-

85 ber near the rear end of the same there is journaled a horizontal shaft 65, whose ends extend beyond the side-walls, as shown, and are provided adjacent thereto with spur-gears 66. Between the bearings the shaft 65 is provided

90 with a "balled-toothed" gear 67, the teeth of which engage with those of the plunger-stem 44. The opposite sides of the pinion 67 are provided with flanges 69, which flanges em-

95 brace the teeth 46 and rest upon the tracks or flanges 47 of the plunger-stem, the rear ends of the latter being raised or elevated, as shown. Below the shaft 65 and the plunger-stem there is journaled a transverse or hori-

100 zontal power-shaft 70, and said shaft is extended beyond the walls of the press and by suitable couplings 71 connected with any ordinary horse-power 72, or, if desired, may be provided with a pulley 73, (shown by dotted

105 lines in Fig. 3,) which is operated by a belt 74 that leads from any suitable motor.

At opposite sides of the press the shaft 70 is provided with small pinions 75 which engage with the spur-gears 66 of the shaft 65 and serve to operate the same. Beyond one

110 of the pinions 75 the shaft 76 is provided with a clutch 77, which is operated by means of a hand-lever 78 fulcrumed at one side of the press. The outer member of the clutch is connected with a sprocket-wheel 79 which is

115 loosely mounted upon the said shaft 70.

Upon a stub-shaft 80, located in front of the front carrier-frame, there is located an idlesprocket-wheel or pulley 81. A sprocket-chain 82, passes over the pulley 79 above and

120 over the small sprocket-wheel at the lower end of the rear endless carrier, and thence forward around the idle sprocket 81, under the same, and over the small sprocket-wheel of the front endless carrier, thence down and around

125 the pulley 79, so that the two sprocket-wheels of the carriers are drawn inward or toward each other, and consequently the belts for feeding the material through the opening in the top of the press feed toward each other.

130

The opposite sides of the baling-press are provided with longitudinal slots 83, (best

shown in Figs. 4, 7 and 9 of the drawings) and the same accommodate trunnions or studs 84 that extend from the opposite edges of a series of spacing-plates 85. At one side of one of the slots 83 there is located a gong or bell 86, and a trip-lever 87 has its tail-end extended into the slot 83 in the path of one of the trunnions 84 of the spacing plate so that as the plates which are introduced between the bales as they are formed pass the point where the bell is located the trunnions of the said plates serve to successively sound the bell, and thus notify the operator when a bale has been completed. It will be observed that by operating the tail-nuts 7 upon the binding-rods 6 at the top and bottom the front ends of the press may be drawn together, or in other words, a proper tension given to the bales so that they will offer a proper resistance to the impact by the pulley and consequently give to the bales as they are formed a proper density.

Upon opposite sides of the press at the rear ends of the side walls thereof spool-receiving brackets 88 are located, and the bracket at one side is near the top of the press, while that at the opposite side is near the bottom of the press. These brackets receive and revolvably support wire-reels or spools 89, and below the elevated bracket and above the depressed bracket are located hooks 90.

The rear axle of the press is provided with an eye 91 and to the same is connected the front hook-end of a head 92 formed upon the rear horse-power 72 before mentioned. By this means the power may be transported together with the press to and from the point of operation. Assuming that the point has been reached where the press is to be operated the horse-power is detached from the eye 91 and being suitably anchored to the ground has its power-shaft connected with that of the press. The power being started and motion given to different parts as described, the hay or other material to be baled is cast upon or between the inwardly-moving feed-belts or carriers 21 and is fed by the latter downwardly into the receiving or packing-chamber of the press. It will be seen that the endless carriers will accommodate themselves to the quantities of material or stuff cast therein, so that the said material receives a partial pressing previous to its arrival into the press. Before making the first deposit in the press a spacing-plate is located therein and the tension of the bottom and top upon the spacing-plate gives the proper resistance to the material being baled. The plunger reciprocates back and forth as the material is deposited, and the tucker operates together with the detents to prevent any withdrawal of the material with the retraction of the plunger, as is usual.

As the hay or material is cast by the carriers into the press, an operator standing on the press grasps the lever 59 and drawing the

same to the front against the tension of the spring 61 liberates the cross-bar 58. This permits the spring 50 to elevate the stirrup and the roller or pulley 51, thus raising the plunger-stem into engagement with the teeth of the revolving pinion 57. These teeth interlocking with those of the plunger-stem serve to press the same forward with the plunger and so compress the hay that has been deposited into the press. The back pressure of the material being baled serves to press the teeth of the plunger against the teeth of the gear so that the latter, being of the shape shown, retains or supports the plunger stem in an elevated position during the forward movement of the same. When the flanges 69 of the pinion 67 arrive in contact with the elevated faces of the tracks or flanges 47 the teeth of the pinion 67 are withdrawn from engaging with the teeth 47 of the plunger-stem so that the latter falls by gravity upon the pulley 51 and the press being inclined or declining from front to rear runs by gravity upon its anti-friction pulley to its resilient or retracted position. When the plunger is about to advance for the purpose of making a compression the shifting-lever 78 is operated to throw the clutch 77 out of engagement with the sprocket 79, so that the movement of the feed-belts 21 is arrested and the hay is not deposited into the chamber. As soon as the operator becomes aware that the bales are moving and therefore as much compression as can be had has been given to the deposit in the press, he withdraws the lever 59 from engagement with the now elevated bar 58, as shown in Fig. 4 and places his foot upon said bar 58, depresses the same against the tension of the spring 50 of the stirrup and at the same time throws the lever 78 so as to cause the clutches to engage and again operate the feed-belts. By thus depressing the bar 58 it will be seen that the plunger-stem is lowered out of contact with the teeth of the pinion, and as before stated, the bottom of the press being declined the plunger and stem will fall by gravity into their retracted positions ready for a new plunge when a new retraction has been made and the levers again operated.

From the foregoing description in connection with the accompanying drawings it will be seen that I have provided an exceedingly simple and cheap press, the same being adapted to positively feed into the press deposits of hay or other material to be baled, and whose feeding may be arrested at the moment that the plunger advances and resumed at the moment the plunger retracts, the latter being uncomplicated and directly under the control of the operator. Now as the bales are formed the attendants standing at opposite sides of the press take the leading ends of the wires and pass them through grooves formed in the faces of the spacing-plates to the opposite sides of the press so that each attendant receives the advanced end of the

opposite wire. These advanced ends are quickly twisted around a convenient hook 90, before mentioned as being located adjacent to the wire-reel supports, and as the bale is further formed and the line of bales advanced the wire will be pulled from the reel, and thus the front ends and sides of the bale will be bound. As soon as the bale is completely formed and a new space-plate placed in rear of the same, which plate is passed through a convenient door 93 which is hinged at its lower end as at 94 to the bottom of the press and provided at its bottom end with a spring-lock 95, the wires are clipped a sufficient distance from the bales and passed back to the operators at the opposite sides of the machine and there tied. In this manner the bales are secured with a pair of wires and are ready to be pushed out at the front of the machine as new bales are formed.

Various changes and modifications of details of my invention will suggest themselves to those skilled in press-building and manipulation, and I would therefore have it understood that I do not limit my invention to the precise details which I have herein shown for effecting the results attained, but hold that I may vary such details to any extent and within the skill of those persons skilled in the art. Having described my invention, what I claim is—

1. A baling-press having an inclined bottom, in combination with a plunger having rollers adapted for movement on the bottom and to fall by gravity to the lower end thereof, a stem extending from the plunger and provided with gear-teeth, a transverse shaft arranged above the plunger, a gear mounted on the shaft and having its teeth adapted to interlock with those of the plunger-stem, and thus support the stem means for raising the stem whereby its teeth engage those of the gear, means for automatically disengaging the teeth of the stem and the gear when the stem has traveled its proper distance, and means for driving the gear, substantially as specified.

2. A baling-press having an inclined bottom, a plunger mounted in the press and anti-friction rollers located on the under side of the plunger, said plunger being adapted to automatically seek the lower end of the press, a stem extending from the plunger, balled teeth arranged on the upper side of the stem, track-flanges at the opposite sides of the stem and having their rear ends raised or elevated, means for raising the stem, a transverse shaft arranged over the stem, means for driving the shaft, a pinion having balled teeth for interlocking with those of the stem, when said stem is raised and annular flanges arranged at opposite sides of the pinion and adapted to travel on the track-flanges of the stem, substantially as specified.

3. A baling-press having an inclined bottom, a plunger mounted for movement in the

press and adapted to automatically seek the lower end of the press, a stem extending from the plunger and provided with teeth upon its upper side, a track at each side of the stem having a rear raised portion, a transverse shaft arranged over the stem, a pinion thereon the teeth of which are designed to engage those of the stem, flanges at the opposite sides of the pinion for traveling on the track flanges of the stem, and means for driving said shafts, of a stirrup mounted in vertical openings in the rear end of the press, a spring for normally elevating the stirrup, a treadle for depressing the stirrup, and a roller mounted in the stirrup and arranged under and adapted to support the stem, substantially as specified.

4. The combination with a baling-press having an inclined bottom, a plunger mounted for reciprocation in the press and adapted to automatically seek the lower end of the same, a toothed stem extending from the plunger and provided at opposite sides with track-flanges, a stirrup passing vertically through the press and embracing the stem, a spring interposed between the upper end of the stirrup and the top of the press and adapted to elevate the stirrup, and a pulley located in the stirrup under the stem and adapted to support the latter, of a lever hinged to the rear end of the press and in front of said point connected loosely with the stirrup, a cross bar arranged upon the upper side of the press, rods connecting the ends of the cross-bar with the cross head of the lever, a hand-lever hinged to the upper side of the press and provided with upper and lower notches for engaging the cross-bar, and a spring for pressing the hand-lever toward the cross-bar, substantially as specified.

5. The combination with a press having the feed-opening in its upper side, and a metal rectangular frame located thereover and provided at its ends with standards connected by cross-bars and at opposite sides with slots, of endless carrier-frames comprising opposite sides and upper and lower shafts and connecting belts, the lower shafts extending through the slots in the side-bars of the frame, rear cross-bars connecting the sides, coiled-springs interposed between the same, and the cross-bars of the frame, grooves framed in the upper edges of the side-bars of the frame, and inclined braces extending from the sides of the carrier-frames and adapted to loosely ride in the grooves, substantially as specified.

6. In a press, the combination with a box, the plunger mounted therein and adapted for movement, of a transverse shaft arranged adjacent to the plunger, and intermediate devices between the plunger and the shaft, said shaft extending beyond the box, gear-wheels mounted on the ends of the shaft, a lower shaft arranged in the box, pinions mounted on the said shaft and engaging the gear wheels, means for driving said lower shaft, a clutch mechanism arranged on the shaft, a lever for

operating the same, a sprocket-wheel arranged beyond the clutch-mechanism, and an opening formed in the upper side of the box, opposite endless carriers arranged at the sides
5 of the opening, a sprocket-chain engaging the sprocket-wheel, and driving-wheels on the endless carriers, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN W. CARMACK.

Witnesses:

W. S. DUVALL,
L. A. GLEASON.