

(No Model.)

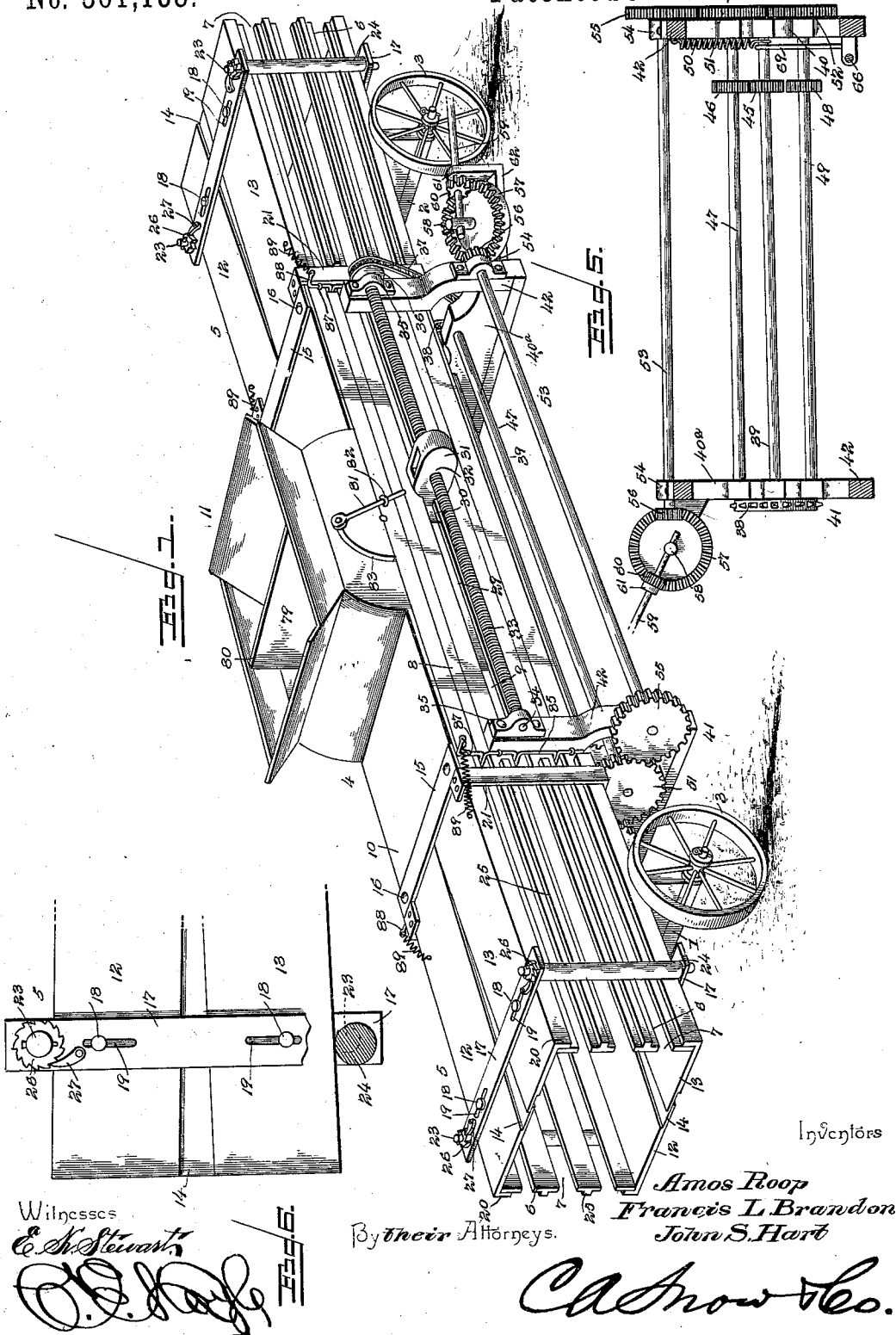
2 Sheets—Sheet 1.

A. ROOP, F. L. BRANDON & J. S. HART.

BALING PRESS.

No. 561,133.

Patented June 2, 1896.



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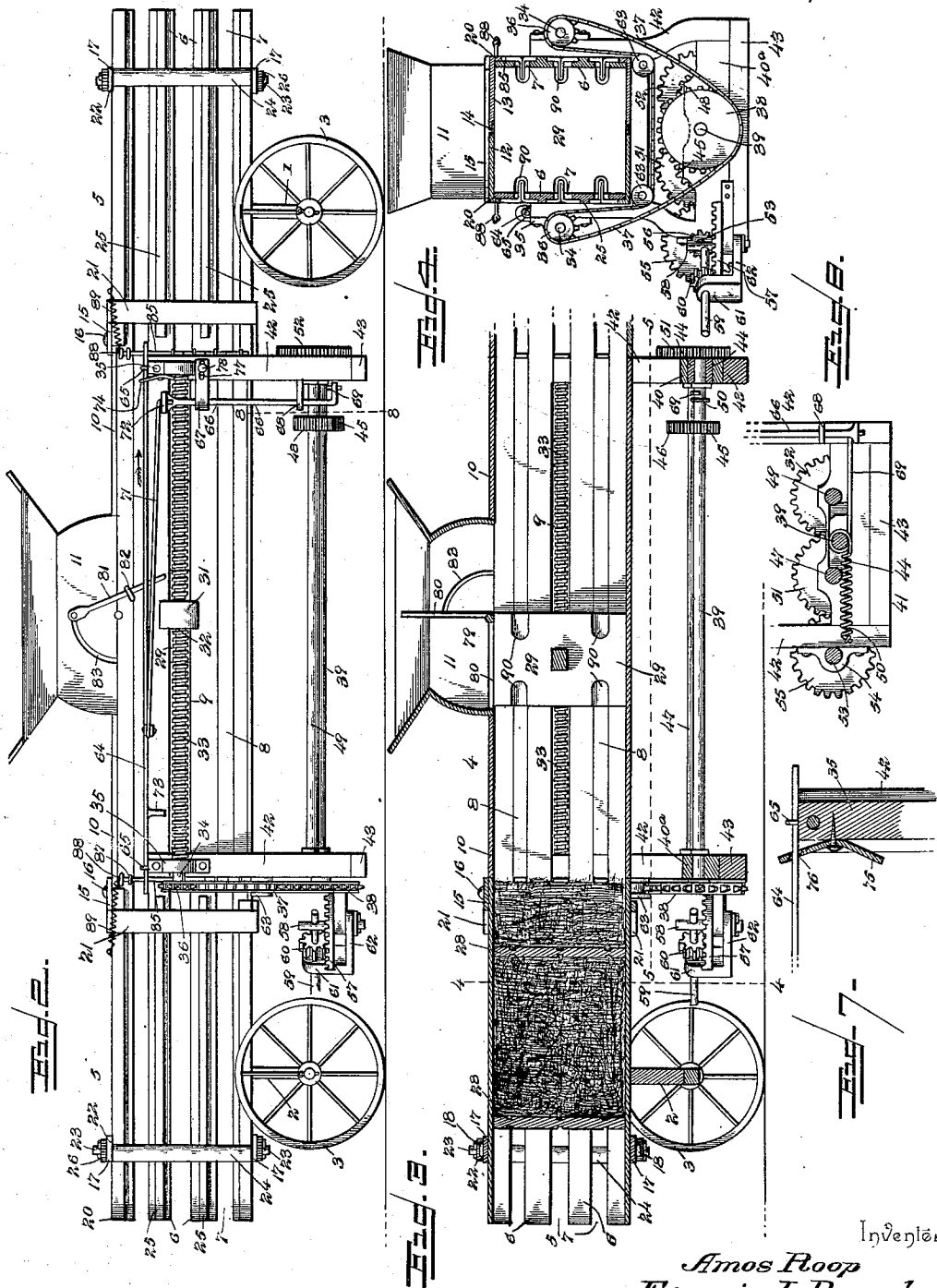
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Witnesses

E. H. Stewart

[Signature]

By their Attorneys.

Amos Roop
Francis L. Brandon
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UNITED STATES PATENT OFFICE.

AMOS ROOP, FRANCIS L. BRANDON, AND JOHN S. HART, OF HICKSVILLE, OHIO.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 561,133, dated June 2, 1896.

Application filed March 19, 1895. Serial No. 542,416. (No model.)

To all whom it may concern:

Be it known that we, AMOS ROOP, FRANCIS L. BRANDON, and JOHN S. HART, citizens of the United States, residing at Hicksville, in the county of Defiance and State of Ohio, have invented a new and useful Baling-Press, of which the following is a specification.

Our invention relates to baling-presses, and has for its object to provide an improved construction of double press, having duplicate baling-chambers in which separate bales are formed at the same time by a single plunger, which moves alternately in opposite directions and which compresses the hay in the chamber toward which it moves; to improve and strengthen the construction of the plunger-box and baling-chambers to secure the requisite strength with the minimum weight; to provide means for securing the desired pressure of the sides of the baling-chambers upon the follower-blocks to regulate the compactness of the bales; to provide new and efficient means for communicating motion from the driving-shaft to the plunger, and to provide efficient shifting or reversing mechanism, operated by the plunger, to change the direction of movement of the latter at the limits of its strokes, such reversing mechanism being independent of the power by which the press is operated, whereby the driving-shaft may rotate continuously in a uniform direction.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a baling-press constructed in accordance with our invention. Fig. 2 is a side view showing the opposite side of the press from that which is indicated in Fig. 1. Fig. 3 is a longitudinal section. Fig. 4 is a transverse section on the line 4 4 of Fig. 3. Fig. 5 is a horizontal section on the line 5 5 of Fig. 3, showing the gearing in plan. Fig. 6 is a detail plan view of the outer end of one of the baling-chambers, partly in section, to show the means for regulating the tension of the side bars by which the movement of the follower-blocks is regulated. Fig. 7 is a detail view of the clutch by which the shifting

or reversing bar is held in place during the return movement of the follower-block. Fig. 8 is a vertical section on the line 8 8 of Fig. 2.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

Upon trucks 1 and 2, having supporting-wheels 3, is mounted the framework of the improved press, having a central plunger-box 4 and opposite alined baling-chambers 5, the sides of said plunger-box and baling-chambers being constructed of continuous metal bars 6, spaced apart to form intervening slots or openings 7 in the sides of the baling-chambers and being held at the desired intervals by spacing or filling blocks 8 in the sides of the plunger-box, whereby the sides of the latter are solid or continuous with the exception of central horizontal slots 9. It will be understood that the sides of the plunger-box may be constructed with the spacing-blocks 8 integral with the bars; but the above-described construction is preferable, for the reason that it simplifies and reduces the cost of manufacture. Transverse blocks 10 are secured to and connect the upper edges of the sides of the plunger-box, and between the inner edges of these blocks is seated the hopper 11, forming a part of an automatic feed mechanism hereinafter more fully described.

The upper and lower sides of the baling-chambers are sectional in construction, each consisting of duplicate side sections 12 and 13, provided with rabbeted overlapping inner edges, as shown at 14, and connected at their inner ends by cleats 15, which are secured thereto by means of bolts 16, thus providing for lateral swinging movement of the outer ends of the sections. Upper and lower transverse cleats 17 connect the outer ends of the sections of the tops and bottoms of the baling-chambers, pins 18, which are secured to and carried by said sections, being arranged to operate in slots 19, formed in the cleats. The outer or lateral edges of the sections 12 and 13 are flanged, as shown at 20, to bear against the outer surfaces of the uppermost and lowermost bars of the sides of the baling-chambers, and the tops and bottoms are connected at their inner ends by means of vertical straps 21. The transverse cleats 17 at

the outer ends of the baling-chambers are extended beyond the planes of the sides of the chambers, and in bearings 22, formed in such extensions, are mounted the reduced spindles 23 at the upper and lower ends of the eccentric rollers or cams 24, and stiffening-ribs 25 are formed on the outer surfaces of the bars 6, the outer surfaces of such stiffening-ribs being in planes corresponding with the outer surfaces of the flanges 20, whereby the surfaces of the eccentric or cam rollers 24 bear against said flanges and rib and provide for the inward adjustment of the outer extremities of the sides of the baling-chambers when said eccentric or cam rollers are rotated. The upper ends of the eccentric or cam rollers are fitted with ratchet-wheels 26, which are engaged by pawls 27 to hold said parts at the desired adjustment and cause the required frictional contact of the inner surfaces of the sides with the follower-blocks 28, (shown in Fig. 3,) which operate in the baling-chambers and are arranged between the bales.

The plunger 29 operates in the plunger-box 4 and is provided with lateral arms 30, which operate in the longitudinal slots 9 in the sides of said box, said arms terminating in nuts 31, having threaded openings 32, with which are engaged the worms or screw-bars 33, having reduced journals 34, mounted in bearings 35 upon the outer sides of the plunger-box. These worms or screw-bars are provided at corresponding ends with chain-wheels 36, traversed by a chain 37, which also passes around a master chain-wheel 38, located below the plane of the plunger-box and secured to a longitudinally-disposed shaft 39, which is mounted in bearings 40 and 40^a in a pendent frame 41, said frame comprising hangers 42, connected at their lower ends by transverse bars 43. The bearing 40 is formed in a bearing-block 44, which is mounted to slide transversely in the frame 41, whereby the pinion 45, also carried by the shaft, may be caused to mesh with a pinion 46 on a longitudinal shaft 47 or a pinion 48 on a similar shaft 49, said shafts 47 and 49 being mounted in permanent bearings also formed in the frame 41. The intervals between the shaft 39 and the shafts 47 and 49 are such as to prevent the pinion 45 from meshing with both of the pinions 46 and 48 simultaneously, and a spring 50 is employed to normally hold the pinion 45 in engagement with the pinion 46. The shafts 47 and 49 are provided at one end with intermeshing gears 51 and 52, whereby motion communicated to the gear 51 causes an opposite rotation of the gear 52, irrespective of the position of the pinion 45.

A longitudinal shaft 53 is mounted in bearings 54 on the pendent frame and is provided at one end with a gear 55 to mesh with the gear 51 and at the other end with a pinion 56, which meshes with a horizontal crown-gear 57, mounted upon a vertical spindle 58 and receiving motion from the driving-shaft 59 through a pinion 60. The inner end of the

driving-shaft is mounted in a bearing in the upper extended portion of the spindle 58, and adjacent to the periphery of the horizontal gear 57 said shaft is mounted in a bearing 61, formed in a swinging frame 62, mounted coaxially with the horizontal gear. The chain 37 passes around direction-pulleys 63, arranged below the plane of the bottoms of the baling-chambers.

From the above description it will be seen that motion communicated to the gear from the driving-shaft will cause continuous rotation of the shafts 47 and 49 in a uniform direction, said shafts 47 and 49, however, turning in relatively opposite directions, whereby when the shaft 39 receives its motion from the shaft 47 it will turn in one direction, thus actuating the worms or screw-bars in a given direction, and when said shaft receives motion from the shaft 49 it will be turned in the opposite direction, thus rotating the worms or screw-bars in the opposite direction to that caused by the first-described adjustment of parts.

In order to secure a reversal of the rotation of the worms or screw-bars at the ends of the strokes of the plunger, we employ a shifting or reversing bar 64, mounted to slide in keepers 65, a rock-shaft 66, mounted in bearings 67 and 68 on the frame 41, a connecting-rod 69 between the crank-arm on the lower end of said rock-shaft and the shaft 39, and a connecting-rod 71 between the reversing or shifting bar and the upper crank 72 of said rock-shaft. The reversing or shifting bar is provided near one extremity with a detent or shoulder 73, which is arranged in the path of one of the arms of the plunger, and near the other end of said bar is arranged a clutch 74, which is adapted to engage the shifting bar when it is moved in the direction indicated by the arrow in Fig. 2 and prevent return movement or movement in the opposite direction until the trip-arm 75 at the lower end of said clutch is engaged by the arm of the plunger. The spring 50, which is above described as being employed to hold the shaft 39 in such position as to cause the pinion 45 to mesh with the pinion 46, serves to return the shifting bar and connected parts to their normal positions after having been moved in the direction of said arrow in Fig. 2, and therefore it is against the tension of this spring that the clutch holds the shifting bar after the latter has been moved in the direction of the arrow at the end of the movement in one direction of the plunger. The clutch is provided with an opening 76, through which the shifting or reversing bar extends, and the upper and lower sides of this opening bite the upper and lower surfaces of the rod to prevent return movement of the same until the clutch has been tripped. In order to vary the position of the detent or shoulder of the shifting bar, and thereby vary the point at which the gearing is shifted to cause reverse movement of the worms or screw-bars, the upper

bearing 67 of the rock-shaft is slotted longitudinally, as shown at 77, and said slot is engaged by a bolt 78, as shown in Fig. 2.

Fulcrumed within the hopper, which communicates with the top of the plunger-box, is a packer 79, having wings 80, arranged perpendicular to each other, and the means for operating this packer consist of levers 81, connected to lateral studs carried, respectively, by the wings and fitted to slide in guides 82 on the sides of the plunger-box. The said studs operate in arc-shaped slots 83 in the sides of the hopper, and the lower ends of the levers are arranged in the paths of the lateral arms of the plunger.

The construction of the packing mechanism above referred to is particularly described and claimed in Patent No. 543,632, granted to us on July 30, 1895.

The guides in which the levers operate provide sliding fulcrums, and as the plunger reciprocates in the plunger-box the lower ends of the levers are alternately engaged by the lateral arms, thus communicating an oscillatory motion to the packer which feeds the hay, cotton, or other material into the plunger-box in front of the plunger.

The detents 84, which are arranged at opposite sides of the baling-chambers, and at their inner ends, are connected by spindles 85, mounted in bearings 87 on the exterior surfaces of the chambers, and the detents extend through the pinions or slots in the sides of the chambers with their inner ends in the path of the plunger. Said spindles are provided at their upper ends with arms 88, to which are connected actuating-springs 89 to normally hold the detents in the path of the plunger and yield when the detents are engaged by the plunger and are swung laterally into the slots or openings. The plunger is provided adjacent to its faces with cavities 90, whereby as the plunger recedes, after having advanced into a chamber, the detents of said chamber are forced into the cavities and thus are disposed in the path of the hay or other material in the chamber to prevent the same from springing back into the plunger-box or to prevent the material baled from following the plunger.

This being the construction of the improved baling-press, the operation thereof, briefly stated, is as follows: Motion is communicated from the driving-shaft through the pinions and horizontal gear to the longitudinally-disposed shaft 53, and from the latter through the intermeshing gears to the shafts 47 and 49, which are thus rotated in opposite directions. The shaft 39, which is arranged between the oppositely-moving shafts 47 and 49, carries a gear (in this case consisting of a chain-wheel) from which motion is communicated to the opposite longitudinally-disposed worms or screw-bars which are operatively connected with the plunger, said worms or screw-bars being turned in the same direction. This intermediate shaft 39 carries a

pinion which is adapted to mesh with a pinion carried by the shaft 47 or a similar pinion carried by the shaft 49, whereby the shaft 39 may receive motion in either direction to communicate motion in either direction to the worms or screw-bars. When the plunger reaches the limit of its movement in the direction indicated by the arrow in Fig. 2, the lateral arm thereof engages the detent or shoulder on the shifting bar and moves said bar in the same direction, thereby partly turning the rock-shaft and drawing the pinion on the shaft 39 into engagement with the pinion on the shaft 49, thereby reversing the direction of rotation of the shaft 39 and communicating a reverse rotation to the worms or screw-bars. Said shifting bar is held in this position after being shifted by the arm of the plunger, and hence the plunger is advanced in the opposite direction to that in which it was moving when the detent or shoulder was engaged thereby. When the arm of the plunger encounters the trip-arm forming a part of the clutch at the opposite limit of movement of the plunger, said clutch is disengaged from the shifting bar, which it previously held in the position desired against the tension of the spring 50, and allows said bar to resume its normal position, to which it is returned with the intermediate connected parts by said spring, whereupon the direction of rotation of the worms or screw-bars is again reversed and the plunger advances in the opposite direction. Each advance movement of the plunger causes an oscillation of the packer, thus feeding the hay, cotton, or other material into the path of the plunger to be pressed into a baling-chamber. The eccentric or cam shafts by which the free ends of the sides of the baling-chambers are adjusted may be turned by means of a wrench or lever, (not shown,) for which purpose the upper ends of the spindles are constructed to form wrench-seats.

It will be understood that in practice various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, we claim—

1. In a baling-press, the combination of a baling-chamber having its sides constructed of continuous spaced metallic bars, the extremities of which are adapted to be adjusted laterally, the upper and lower sides of the baling-chambers being constructed of longitudinal sections having overlapping joints at their inner edges and flanged outer edges to engage the outer surfaces of the uppermost and lowermost bars, means for adjusting the extremities of the bars forming the sides of the baling-chambers and the sections of the upper and lower sides, a plunger operating in the plunger-box, and means for communicating motion thereto, substantially as specified.

2. The combination of a plunger-box and opposite alined baling-chambers communicating with the plunger-box and having their sides constructed of spaced bars which are integral with the sides of the plunger-box and are free at their outer ends, the tops and bottoms of the chambers comprising relatively adjustable sections provided with inner overlapping joints and exterior flanges to engage the surfaces of the sides, cleats connecting the inner ends of said sections, exterior bars connecting the corresponding sections of the tops and bottoms adjacent to their inner ends, transverse horizontal cleats near the outer ends of the chambers, eccentric or cam rollers journaled at their extremities in the ends of said cleats and capable of adjustment to move the extremities of the sides of the chambers laterally, means for securing said rollers at the desired adjustment, a plunger operating in the plunger-box and means for operating the plunger, substantially as specified.

3. The combination of a plunger-box, and opposite alined baling-chambers communicating with the plunger-box, the sides of the baling-chambers consisting of spaced bars integral at their inner ends with the sides of the plunger-box and free at their outer ends for lateral adjustment, said bars being provided with exterior strengthening-ribs, sectional tops and bottoms for the baling-chambers, the sections having interlocking inner edges and flanged outer edges, the outer surfaces of the flanges being flush with the outer surfaces of said strengthening-ribs, means for pivotally connecting the inner ends of the sections of the tops and bottoms, means for connecting the corresponding sections of the tops and bottoms at their inner ends, transverse cleats arranged horizontally in contact with the exterior surfaces of the tops and bottoms near the outer extremities of the chambers, said cleats being provided with longitudinal slots in which operate guide-pins carried by the sections, eccentric or cam rollers mounted in bearings in the projecting ends of said cleats and bearing against the flush exterior surfaces of said flanges and ribs, means for locking the rollers at the desired adjustment, a plunger operating in the plunger-box, and means for communicating motion to the plunger, substantially as specified.

4. The combination with opposite alined baling-chambers and an intermediate plunger-box, of a plunger operating in said box, and having lateral arms operating in slots in the sides thereof, longitudinally-disposed worms or screw-bars mounted for rotation upon opposite sides of the plunger-box and engaging nuts carried by the lateral arms of the plunger, a master-gear operatively connected with said worms or screw-bars, an adjustable shaft carrying said master-gear, shafts arranged upon opposite sides of and parallel with said adjustable shaft, pinions carried by the adjustable and the opposite shafts, the pinion on the adjustable shaft be-

ing adapted to mesh with the pinion on either of the opposite shafts, means for imparting motion in opposite direction to the opposite shafts, and means actuated by the plunger for shifting said adjustable shaft to secure reversal of rotation of the worms or screw-bars at the limits of movement of the plunger, substantially as specified.

5. The combination with opposite alined baling-chambers and an intermediate plunger-box, of a plunger operating in said box, worms or screw-bars mounted to rotate upon opposite sides of the plunger-box and engaging nuts carried by the plunger, a shaft 53, connections between said shaft and the worms or screw-bars, whereby the direction of rotation of said worms is reversed at the limits of movement of the plunger, a horizontal gear meshing with a pinion carried by said shaft 53, a swinging arm fulcrumed coaxially with the horizontal gear, and a driving-shaft mounted in a bearing in the outer extremity of said swinging arm and a corresponding bearing concentric with the horizontal gear and carrying a pinion to mesh with said horizontal gear, substantially as specified.

6. The combination of opposite alined baling-chambers and an intermediate plunger-box, of a plunger, worms or screw-bars arranged parallel with the direction of movement of the plunger and engaging nuts carried thereby, means for communicating motion to said worms, and shifting mechanism including a longitudinally-movable shifting rod arranged parallel with the direction of movement of the plunger and provided at one end with a detent or shoulder in the path of an arm of the plunger, a spring for holding the shifting rod in one of its adjusted positions and return the same thereto when released, and a clutch engaging the shifting rod and adapted to hold the same in the other adjusted position against the tension of said spring, the clutch being provided with a trip-arm arranged in the path of said arm of the plunger, substantially as specified.

7. The combination with opposite alined baling-chambers and an intermediate plunger-box, of a plunger, worms or screw-bars arranged parallel with the direction of movement of the plunger and engaging nuts carried thereby, an adjustable shaft operatively connected with the worms or screw-bars and adapted to be adjusted to receive motion from either of a pair of oppositely-moving shafts, a spring for holding said shaft in one of its adjusted positions, a rock-shaft having an arm connected with said shaft to move it in opposite direction against the tension of said spring, a longitudinally-movable shifting bar provided at one end with a detent or shoulder in the path of an arm of the plunger, connections between said shifting rod and the rock-shaft, and a clutch arranged in operative relation with the shifting rod to hold the same in one of its adjusted positions against the tension of the spring which actuates the ad-

justable shaft, and provided with a trip-arm in the path of said arm of the plunger, substantially as specified.

8. The combination with opposite alined
5 baling-chambers and an intermediate plunger-box, of a plunger having lateral arms operating in slots in the sides of the box, parallel worms mounted in bearings at the sides of the box and engaging nuts carried by said
10 arms of the plunger, an adjustable shaft operatively connected with the worms and mounted at one end in an adjustable bearing, shafts 47 and 49 mounted upon opposite sides of the adjustable shaft, a pinion carried by the adjustable shaft to mesh alternately with corresponding pinions on the shafts 47 and 49, a
15 spring to hold said adjustable shaft in position to cause engagement of its pinion with the pinion of one of said opposite shafts, a rock-shaft connected with the adjustable shaft and adapted when turned to cause engagement of the pinion of said adjustable shaft with the

pinion of the other opposite shaft, a shifting rod arranged parallel with the direction of movement of the plunger and provided at one
25 end with a detent or shoulder in the path of an arm thereof, a clutch to engage and hold said shifting rod in one of its adjusted positions and provided with a trip-arm in the path of said arm of the plunger, a connecting-
30 rod between the shifting rod and the rock-shaft, and means for adjusting the rock-shaft to vary the position of the detent or shoulder of the shifting rod, substantially as specified.

In testimony that we claim the foregoing as
35 our own we have hereto affixed our signatures in the presence of two witnesses.

AMOS ROOP.
FRANCIS L. BRANDON.
JOHN S. HART.

Witnesses:

J. M. WILLIT,
T. H. B. CORRELL.