No. 627,460. Patented June 20, 1899.

J. HEASTON.

BALING PRESS.

(Application filed May 18, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

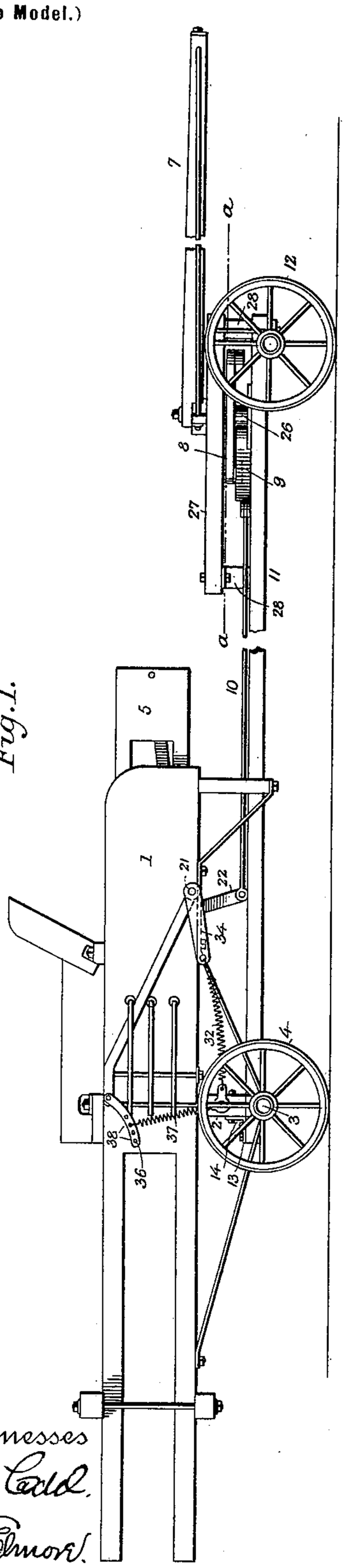

Fig. 2.

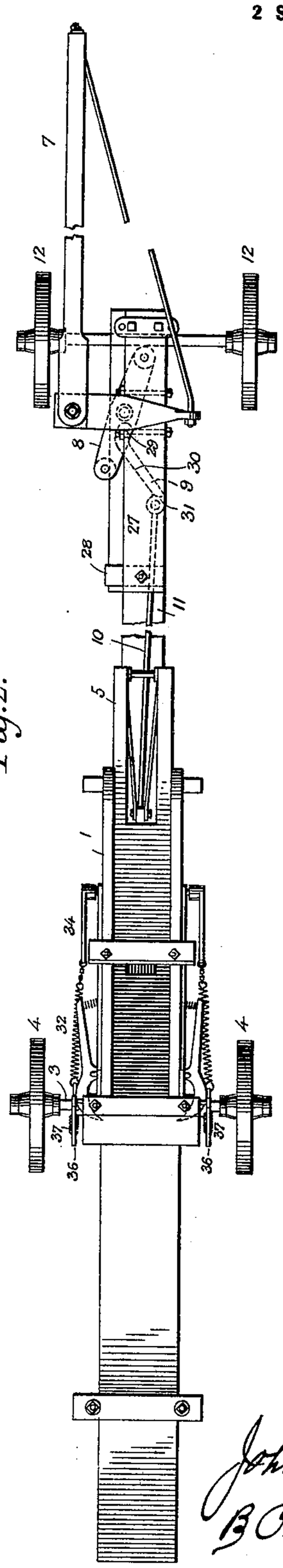

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Fig. 5.

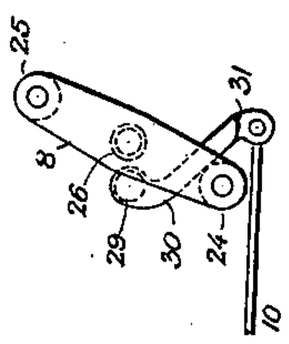


Fig. 7.

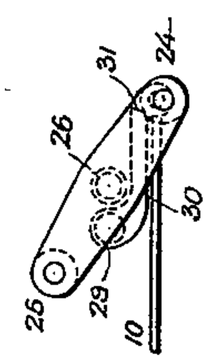


Fig. 3.

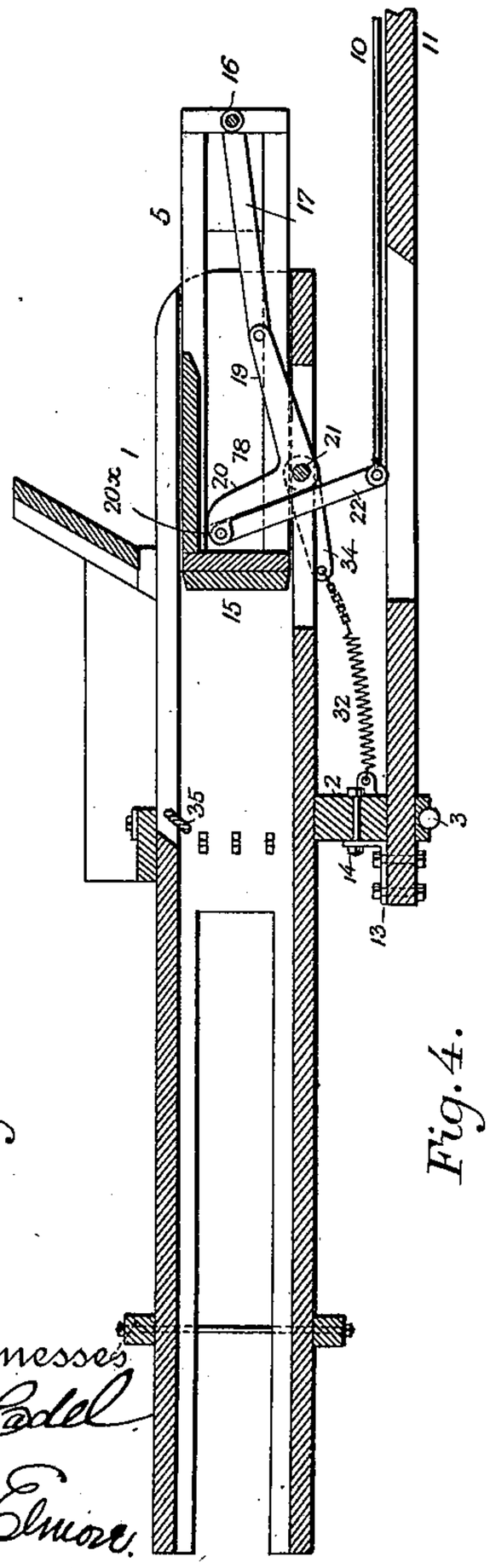


Fig. 4.

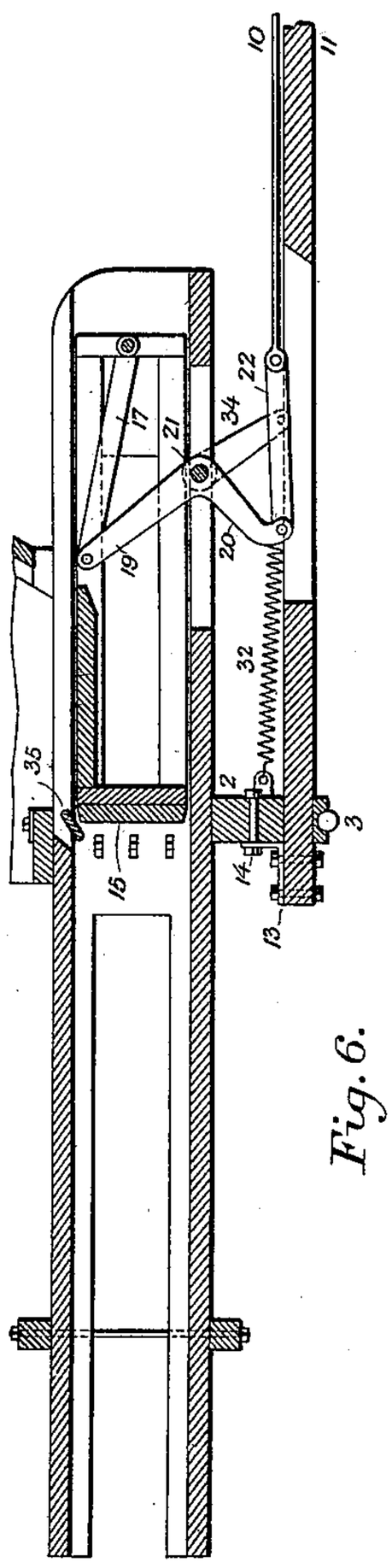
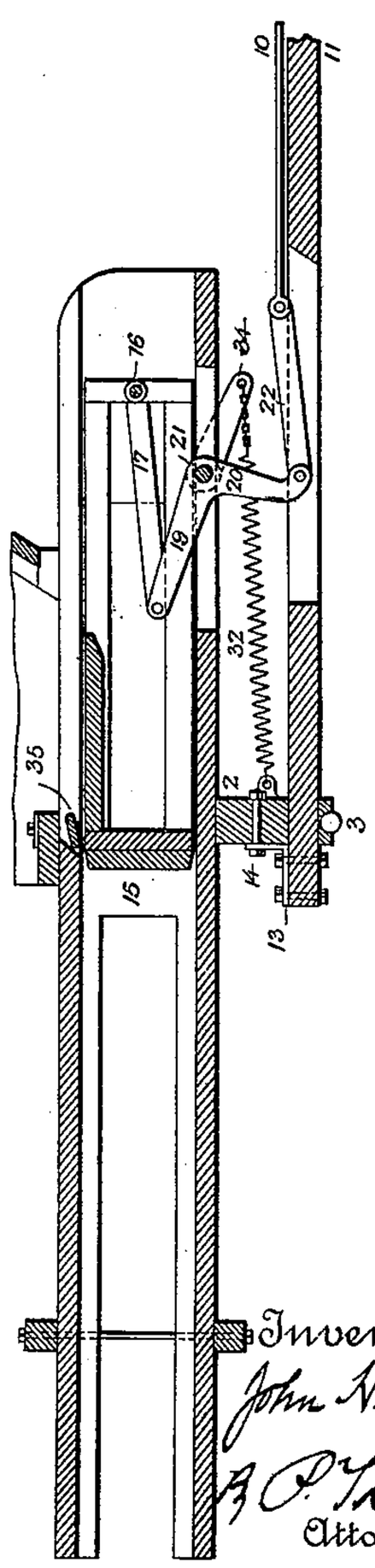


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN HEASTON, OF NASHVILLE, TENNESSEE.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 627,460, dated June 20, 1899.

Application filed May 18, 1898. Serial No. 681,093. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEASTON, of Nashville, county of Davidson, and State of Tennessee, have invented a new and useful Improvement in Baling-Presses, of which the following is a specification.

This invention relates to presses designed for baling hay or other materials, and has reference more particularly to that type of presses embodying a baling-trunk, a reciprocating plunger, and a rotary sweep operatively connected to the plunger.

The invention consists in various improvements in presses of this character, having in view simplicity and durability of construction and effectiveness in operation.

The invention also consists in the details of construction and combination of parts, hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of my improved press. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical longitudinal sectional elevation of the baling end of the press on an enlarged scale. Fig. 4 is a similar view showing the parts in a different position. Fig. 5 is a horizontal sectional elevation of the power end of the press, on an enlarged scale, on the line *a a* of Fig. 1, the parts being in the position they occupy when the plunger is in the position shown in Fig. 4. Fig. 6 is a view similar to Fig. 4, with the plunger at the end of its stroke. Fig. 7 is a view similar to Fig. 5, with the parts in the position they occupy when the plunger is in the position shown in Fig. 6.

Referring to the drawings, 1 represents a trunk or baling-chamber provided, as usual, with an opening in its top for the introduction of the material to be baled. It is sustained by a bolster 2, which in turn rests in an axle 3, on which are mounted ground-wheels 4.

5 represents a plunger mounted to reciprocate within the trunk, as more fully described hereinafter.

6 represents the power or forward end of the press, comprising a sweep 7, a roller-arm 8, operated thereby, and a cam-arm 9, operated by the roller-arm and adapted to give motion to the plunger through the medium of a draw-rod 10. These parts are mounted on the forward end of a coupling-beam 11, sustained by ground-wheels 12 and extending rearward along the under side of the trunk beyond the bolster and over the axle, it being detachably connected to the bolster by means of an angle-plate 13, fixed to the upper side of the coupling-beam and connected to the bolster by a horizontal removable coupling-bolt 14. This construction admits of the shortening of the press for transportation over the field, it being but necessary to remove the coupling-bolt and disconnect the draw-rod and push the power end toward the trunk, the coupling-beam sliding over the axle and extending along the under side of the trunk.

The plunger is formed with a vertical pressure-face 15 and beyond and forward of the face with a vertical slot, through which is extended at the front end of the plunger a horizontal rod 16, and on this rod are mounted the front ends of two links 17, the rear ends of which are jointed to one end of an angular rocking lever 18, comprising a front arm 19 and a rear arm 20, the links being connected at their rear ends to the arm 19. The rocking lever is mounted at its angle on a horizontal rock-shaft 21, journaled on the under side of the trunk, and the other arm 20 of the rocking lever is connected by a link 22 to the rear end of the draw-rod 10 before alluded to. The relative arrangement of these parts and the form of the rocking lever are such that when the plunger is at the beginning of its stroke, as shown in Fig. 3, the links 17 and the arm 19 of the rocking lever will extend in a substantially straight line, with the link 22 extending alongside of the arm 20 and the draw-rod at the rear end of its movement and extending closely along the top of the coupling-beam. If now the draw-rod is moved forward to the position shown in Fig. 4, the rocking lever turning on its axis its arm 19 will be moved rearward and by means of the connecting-links 17 will move the plunger rearward toward the discharge end of the trunk. At the same time the arm 20 of the rocking lever will be moved downward and forward, the coupling-beam at this point being recessed vertically, as at 23, so as not to interfere with the movement of the press. In this position of the parts the plunger has nearly completed its stroke, while the draw-rod has made but half its movement. On the

further and remaining movement of the draw-rod to the position shown in Fig. 6 the plunger will be caused to finish its stroke, which at this point will be far less in proportion to the movement of the draw-rod than was its first main movement. The result of this is that the first part of the stroke of the plunger will be rapid, while the last part of the stroke—that where the resistance of the compressed mass is greatest—will be proportionately slower. In connection with this action of the plunger the power mechanism is so constructed that the effect is augmented—that is to say, the draw-rod is moved slower at the beginning of the stroke of the plunger and less power is required to finish the stroke, owing to the increase of leverage on the cam-arm, as will now be described.

The roller-arm 8 consists of a flat plate having friction-rollers 24 and 25, respectively, on its end on the under side, and it is fixed to a vertical shaft 26, mounted in bearings in the coupling-beam, and bracket-plate 27, overlying the forward end of the beam and sustained by vertical overhanging brackets 28, rising from the beam. The roller-arm is situated between the bracket-plate and beam and receives a rotary motion from the sweep 7, which is fixed to the upper end of the shaft above the bracket-plate. The cam-plate 9 is pivoted at its inner end on a vertical axis 29, situated a short distance longitudinally in rear of the shaft 26, and the plate is formed with a vertical cam-rib 30, terminating at its extremity in a rounded end, as 31. This cam-surface is adapted to be engaged by the rollers, as shown in Fig. 5, the rollers disengaging the cam-surface at about the point where the circular paths of the rollers and the end of the cam-rib coincide, as shown in Fig. 7. When the plunger is in the position shown in Fig. 1, the draw-rod is at the end of its rearward movement, with the cam-arm extending rearward, as seen in Fig. 2. On the rotation of the sweep in the direction of the arrow in Fig. 2 the roller 24 on the end of the roller-arm will engage the cam-rib at about midway of its length, and on the continued movement of the sweep the roller will move along the cam-rib toward its outer end to the position shown in Fig. 5, thus gradually approaching the point of connection of the draw-rod and cam-arm and proportionately increasing the leverage on the arm and proportionately reducing its speed of movement. On the further movement of the sweep the cam-arm will be carried around to the position shown in Fig. 7, at which point the circular paths of the roller and cam-rib coincide and separate, and the cam is disengaged and through its connection with the plunger rebounds to its original position to be engaged by the other roller 25. It is thus seen that owing to the different circular paths followed by the cam and rollers, which is due to the relative location of their axes, as described, the roller gradually moves from the axis of the cam-arm toward its outer end, thereby gradually increasing the leverage and correspondingly reducing the speed, so that when the plunger approaches the end of its stroke, where force required to compress is greatest, it moves slowly and is forced to its work under increased leverage. During the back-and-forth movement of the draw-rod it lies closely against the upper side of the coupling-beam, and thus offers no obstruction to the travel of the draft-animals.

In order to insure a prompt and quick rebound of the plunger to provide for the return of the cam-arm to its original position at rest before being engaged by the advancing roller, so as to prevent the shock of the rebound being transmitted to the animals through the roller-arm, I provide two springs 32, connected at their rear ends to the sides of the bolster 2 and at their forward ends to arms 34, fixed to the ends of the rock-shaft 21. The arrangement of the arms and springs is such that as the plunger is moved to press the charge the springs will be extended under tension, and on the disengagement of the cam by the rollers the springs will, in resuming their normal condition, act through the arms 34, rocking lever 18, and link 22 to return the draw-rod instantly to the position shown in Fig. 2, thereby avoiding any liability of its striking the advancing roller.

In order to fold in any loose material which may be drawn in over the top of the plunger, I provide a folder 35, consisting of a plate mounted at its upper end on a horizontal axis at the rear end of the opening in the top of the trunk. The axis of this plate is extended outward at its ends and provided with downwardly-extended arms 36, acted on by springs 37, connected at their ends to the sides of the bolster. These arms and springs are so arranged that the folder-plate will be held yieldingly in a downwardly and rearwardly inclined position, as shown in Fig. 4, the springs permitting the plunger to pass beneath it, as shown in Fig. 6. In order to vary the tension of the springs to meet the conditions encountered in practice, I provide for the attachment of the springs at different points in the arms by providing the latter with holes 38. By connecting the springs near to or farther from the axis their action on the folder may be increased or diminished.

The manner of connecting link 22 to the beam 20 of the rocking lever is of importance, it being observed that the end of the arm is bent laterally and recessed to form two ears $20^{\times}$ and 20^{0}, the end of the link being pivoted between these ears. This arrangement admits of the link extending parallel to the arm 20 and alongside the same when the parts are in the position represented in Fig. 3.

Having thus described my invention, what I claim is—

1. In a baling-press, the combination with a baling-trunk, of a plunger therein, an angular lever mounted to rock on a horizontal axis below the bottom of the plunger, said lever

comprising front and rear arms, a link connected at one end of the front arm and at its opposite end to the plunger forward of the axis of the lever, a power mechanism forward of the press, and a draw-rod operatively connecting the power mechanism with the rear arm of the lever.

2. In a baling-press, the combination with a baling-trunk, of a reciprocating plunger therein, an angular rocking lever mounted on a horizontal axis below the bottom of the plunger, and comprising front and rear arms, a link having its rear end connected to the front arm of the lever and its other end connected to the plunger forward of its axis, a power mechanism forward of the press, a draw-rod operated thereby and extending rearward, and a link connecting the rear end of the draw-rod with the rear arm of the lever.

3. In a baling-press the combination with a baling-trunk, of a reciprocating plunger therein, an angular rocking lever comprising a front arm 19 and a rear arm 20, the former extending laterally at its end opposite the front arm a link connected at its rear end to the front arm 19 and at its opposite end to the plunger, a power mechanism forward of the press, a draw-rod operated thereby and extending rearward, and a link connecting the draw-rod with the laterally-extending end of arm 20.

4. In a baling-press, the combination with a baling-trunk, of a plunger therein having a front pressure-face and a top and side walls, an angular rocking lever mounted on a horizontal axis below the bottom of the plunger and comprising front and rear arms extending upward into the plunger beneath the top wall and between the side walls when the plunger is retracted, a link having its rear end connected with the front arm of the lever and its other end connected with the front end of the plunger forward of the axis of the lever, a power mechanism forward of the press, a draw-rod extending rearward therefrom, and a link connecting the rear end of the draw-rod with the rear arm of the lever.

In testimony whereof I hereunto set my hand, this 26th day of April, 1898, in the presence of two attesting witnesses.

JOHN HEASTON.

Witnesses:
W. J. ANDERSON,
JAS. J. CORRIGAN.