A. BENSON & E. C. SHAW.

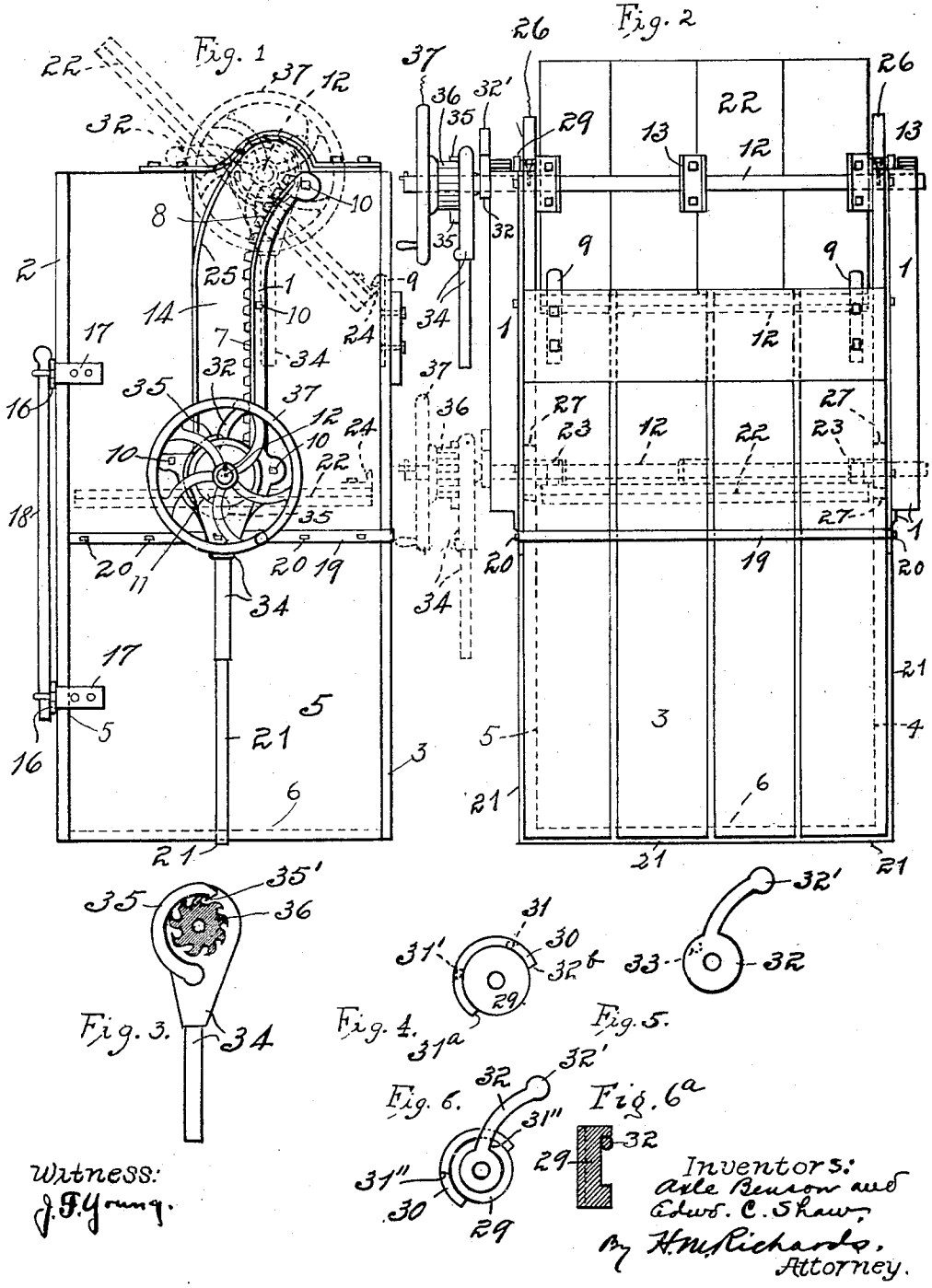
BALING PRESS.

APPLICATION FILED NOV. 28, 1916.

1,251,740.

Patented Jan. 1, 1918.

2 SHEETS—SHEET 1.



Witness:
J. F. Young.

Inventors:
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2 SHEETS—SHEET 2.

Fig. 7.

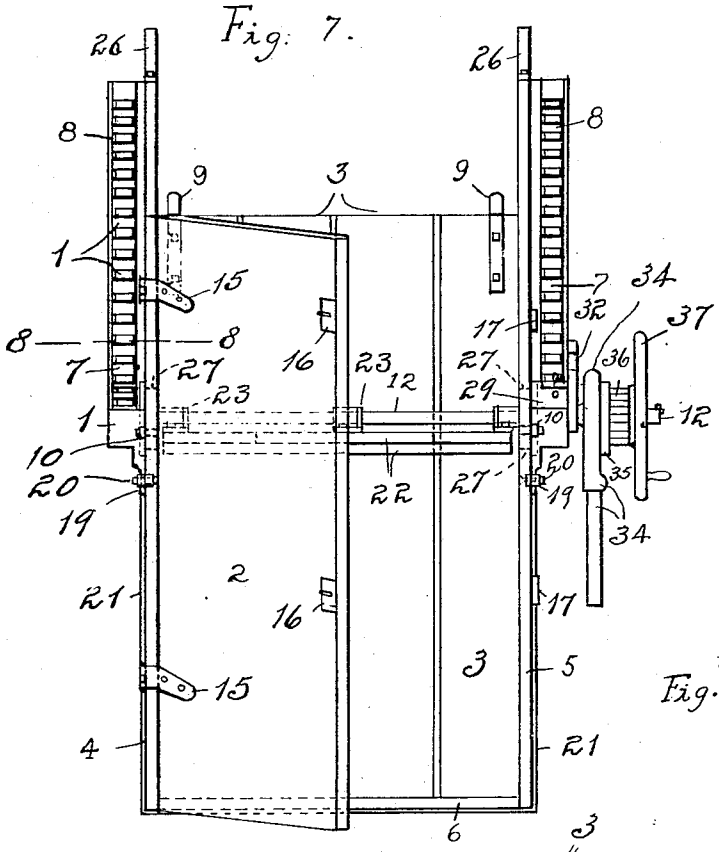


Fig. 8.



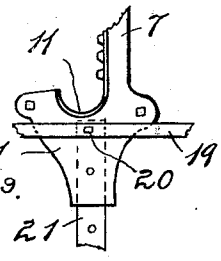
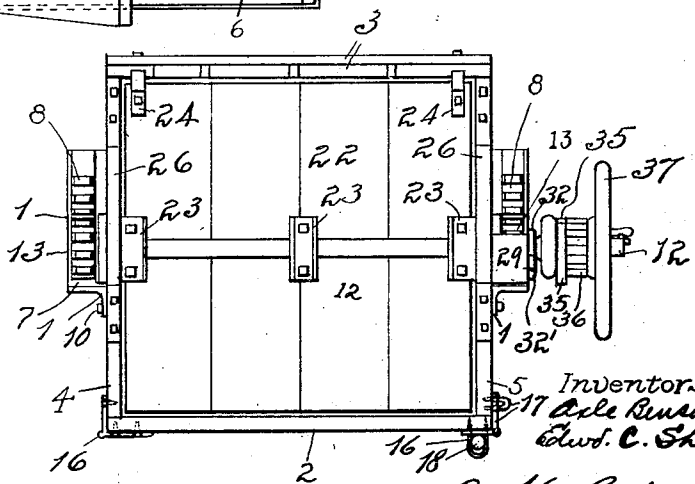


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

AXLE BENSON AND EDWARD C. SHAW, OF GALESBURG, ILLINOIS, ASSIGNORS TO THE CRANE MANUFACTURING COMPANY, OF GALESBURG, ILLINOIS, A CORPORATION OF ILLINOIS.

BALING-PRESS.

1,251,740. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed November 23, 1916. Serial No. 133,960.

To all whom it may concern:

Be it known that we, AXLE BENSON, formerly a subject of the King of Sweden, but who has made application for citizenship and received his first naturalization papers of the United States, and EDWARD C. SHAW, a citizen of the United States, and both of whom are residents of Galesburg, in the county of Knox and State of Illinois, have jointly invented a new and useful Baling-Press, of which the following is a specification.

Our invention relates to baling-presses of that type in which a stationary rack and traveling pinion constitute the means for providing the pressure. We are aware that presses of this character have heretofore been used. Therefore the principal end and object of this invention is to generally improve the construction and increase the capacity, utility and efficiency of presses of this nature.

The nature of these objects will be in part particularly pointed out and in part obvious.

In the accompanying drawings, which illustrate a preferred embodiment of our improvements:

Figure 1 is a side elevation, the platen and the elements which actuate it shown in elevated position by dotted lines and in lowermost position by full and dotted lines;

Fig. 2, a rear elevation, the platen and the elements which actuate it shown by full lines in elevated position and by dotted lines in lowermost position;

Fig. 3, a detail of the final-compression lever and parts connected therewith;

Fig. 4, a detail of the dog for preventing the platen from moving upward when the final-compression lever is being operated and for automatically stopping its downward movement;

Fig. 5, a detail of the dog-actuating lever;

Fig. 6, a modified form of the dog shown in Fig. 4;

Fig. 6^a, a sectional detail in Fig. 6;

Fig. 7, a front elevation;

Fig. 8, a sectional detail of the rack, its plane taken in the line 8—8 in Fig. 7;

Fig. 9, a detail of the lower end of the right hand rack, showing also the manner of connecting the reinforce straps thereto; and

Fig. 10, a top plan.

Coming now to a detailed description of the drawings, and designating each element, and, where necessary, each part thereof by a distinguishing reference numeral, uniformly employed, 2 denotes the hinged front, 3 the back, 4 the left and 5 the right hand side of a press-box or compression chamber.

We prefer that the sides 4 and 5 of the press-box rise somewhat above the front and back, primarily in order to give greater rigidity to the upper portions of the racks. Each side is provided with a slot 14. 15, 15 indicate hinges whereby the door is hung. 16, 16 indicate lock-members secured on the door; 17, 17 indicate lock-members secured on the side 5, and 18 indicates a locking-rod whereby both the upper and lower members of the lock are connected. A strong retaining strap 19 embraces the back and sides of the box and is secured thereto by bolts or rivets 20, a portion of which pass also through the lower portion of the concaves 11. A strap 21 passes beneath the floor 6, its terminals being brought up and secured to both the sides of the box and to the concaves 11—see Fig. 9—whereby to insure against the floor being torn loose from the box when great power is being exerted.

In this type of presses it is desirable—in fact, in order to achieve the best results it is absolutely essential that there be no angles in the rack, for if there be the pinion (which moves the platen) will hesitate, jump, and otherwise travel unevenly thereover. In order to avert this and further in order to cause the pinion or pinions to travel in the most facile manner and without unnecessary exertion on the part of the operator, we have provided the racks 1 shown, which comprise each a substantially vertically arranged body portion 7 and an upper portion 8, the latter being formed in the arc of a circle of which the platen-catching hooks 9 are substantially the center. The racks are arranged one at each side of the press-box and are suitably secured thereto by bolts 10 or the like. The lower end portion of the rack-casting 1 is formed into a concave 11 to provide a rest for the shaft 12 on which the pinions 13, 13′ are fixed.

Secured on the top of the platen 22 are substantially U-shaped clips or eyes 23 in which the shaft 12 seats, whereby the platen may swing thereon. Fixed on the rear edge of the platen are hooks 24 each of which is

adapted to engage a hook 9 secured preferably on the back of the press-box. The exact locations of these several co-acting hooks is immaterial.

Guide-and-bearing straps 25 are secured one on the front wall of each slot 14, their upper ends projected rearwardly and secured to and on the upper edges of the sides 4 and 5. 26, 26 indicate side-wall retaining straps each overlying one of the straps 25, and each is secured to the upper edge of the side above which it rests. The purpose of the straps 26 is to prevent the walls providing the slots 14 from spreading and further to add strength to the sides *per se*.

Rotatably mounted on opposite end portions of the shaft 12 are rollers 27, for purposes presently to be described. Fixed on said shaft, just outside each roller 27, is a platen-actuating pinion 13, 13'. Pivotally mounted on the shaft is a dog 29 having a circular flange 30 in which are secured pins 31, 31',—see Fig. 4. A modified form of this dog is illustrated by Fig. 6, wherein the flange 30 is cut away to provide shoulders 31'' which serve the same purposes, in substantially the same manner, as do the pins 31. Coacting with the dog 29 is a lever 32 pivoted on the shaft 12 and having a counterweight 32' on its free end. Secured in one corner of the lever 32 is a pin 33. 34 indicates a final-compression lever to which is pivoted a pawl 35—the lever pivotally mounted on the shaft 12. 36 indicates a ratchet-wheel fixed on the shaft 12 and adapted to be engaged by the hook 35' of the pawl 35. A crank-wheel 37 which may be either cast integral with the ratchet wheel or be separate therefrom and fixed on said shaft, is employed as the means for actuating the shaft 12, although any other suitable means may be substituted therefor.

Assume the parts to be in the relative positions shown by dotted lines in Fig. 1, and a quantity of material to be baled to be within the press-box.

The operator would throw the rear end of the lever 32 rearwardly, thus striking its pin 33 against the pin 31, giving the dog 29 a part rotation rearwardly, freeing its front edge or tooth 31^a from the rack-tooth with which is was engaged and permitting its rear edge or tooth 32^b to ratchet over the rack-teeth as the platen and operating parts move downward. This downward movement will continue until the platen rests upon the material in the press-box. Thereupon the operator will actuate the crank-wheel 37 and thereby the pinions 13, 13' and shaft 12, by reason of the pinions intermeshing with their respective coacting racks, and the dog-tooth 32^b will constantly ratchet into and over the rack-teeth. It is to be particularly noted that immediately upon the starting of the platen and the operating parts in their movement they will travel throughout the entire length of the rack by their own gravity and there will be no stoppage, jerking or jumping, because there is no horizontal and no angular portion in either rack.

The weight and consequent momentum of the platen and the operating parts tends to cause them to fall with great speed, which would cause the crank-handle to revolve so rapidly that should it strike the operator it might cause him injury. The dog 29 obviates this, for the said momentum causes its tooth 32^b to be automatically thrown forwardly whereby its tooth 31^a will be thrown into engagement with the rack-teeth and the downward movement of the parts be automatically stopped.

The material in the press-box is then compressed by turning the crank-wheel, causing the pinions to travel down the racks in an evident manner. When it has been compressed as closely as may be by means of the crank the latter is released by the operator. The resiliency or tendency of the compressed material to spring back bears upward on the platen and thereby on the shaft and pinions, and the pin on the counterweight-lever 32 will strike the rear one on the dog 29 and throw the tooth 32^b into the rack-teeth, thereby preventing upward movement.

In order to compress the bale more firmly and tightly than can be done by means of the crank-wheel the operator will, when the last described operation has been completed, reciprocate the lever 34 to cause the hook 35' of the pawl 35 to successionally catch the teeth of, and to rotate the ratchet-wheel 36, thus causing the pinions 13, 13' to travel downwardly over the rack-teeth, the dog 29 being held, by means of its counterweight, in one of the notches of the rack and thereby preventing upward movement of the platen.

The usual grooves for the baling-wires are provided in the back, the floor, and the bottom of the platen. When the bale has been completed the rod is removed in order to permit the door-lock members to be disengaged and the door opened, whereupon the ends of the respective wires are tied or twisted in the usual manner. The pawl 35 and lever 32 are then thrown forwardly to respectively release the pawl from the ratchet-wheel teeth and the dog 29 from the rack-teeth, whereupon the operator will turn the crank-wheel clockhandwise whereby to cause the pinions to travel up their respective racks. The shaft 12 will thus be carried upward, and inasmuch as it carries the platen the hooks 24 will catch on or engage the hooks 9 to stop the movement of the rear edge of the platen, the forward edge of which will be carried farther upward, however, by the rising movement of

the shaft and the eyes 23 until it assumes a substantially vertical position, if it be desired to raise it to that extent. When it is raised to such position, or approximately so it forms the roof of a chute-like mouth of which the press-box sides 4 and 5 constitute the sides and the press-box door the front.

A purpose, not hereinbefore recited, of the flange on the dog 29 is that it substantially covers the pinion and prevents the hand or the clothing of the operator being drawn into the gear.

The rollers 27 fit one in each of the slots 14 and bear each against the adjacent guide-and-bearing straps 25. When power is being exerted (in order to compress the bale) the tendency of the pinions 13, 13′ is to move away from and out of mesh with the teeth of their respective racks. The rollers, it will be evident, hold the shaft 12 from bodily forward movement and thus hold the pinions positively from disengagement from said teeth. Moreover, if they were not provided, and if the shaft itself bore against said straps, the latter would very quickly cut into the shaft, whereby it would not only become weakened but would permit the pinions to disengage from the rack teeth.

The rollers perform still another function, namely, they greatly reduce the friction, which, when the power is being applied, would otherwise be great because of the above recited tendency of the rollers to move away from the racks and which would thereby cause the shaft to bear forcibly against the straps 27. In this connection it may be mentioned that the rollers rotate in a direction contrary to that of the pinions.

Accordingly we claim:

1. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots, each of said racks having its upper portion continuously curved, a platen-carrying shaft working in said slots, a platen carried thereby, pinions fixed one on each outer portion of the shaft, and a dog having two ends either of which is adapted to engage one of said racks to lock said pinions from movement.

2. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots, each of said racks having its upper portion continuously curved, a platen-carrying shaft working in said slots, a platen carried thereby, pinions fixed one on each outer portion of the shaft, and a dog pivoted on the shaft and having two ends either of which is adapted to engage one of said racks to lock said pinions from movement.

3. In a baling-press, a press-box having in each of its sides a slot, toothed racks fixed one adjacent each of said slots, the upper portion of each rack forming a continuous curve, a platen-carrying shaft working in said slots, a platen carried thereby, pinions fixed one on each outer portion of the shaft, and a dog having two ends either of which is adapted to engage one of said racks to lock said pinions from movement.

4. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots and each rack having a substantially vertical lower portion and a continuously curved upper portion, a shaft operating in the slots recited, a platen suspended from the shaft, and pinions fixed on the shaft, each pinion intermeshing with one of said racks.

5. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots and each rack having a substantially vertical lower portion and a continuously curved upper portion, a platen-carrying shaft traversing said slots, a platen carried thereby, pinions fixed one to and near each outer end of the shaft, a dog adapted to engage one of said racks, and means for throwing the dog into or out of engagement with said rack.

6. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots, the upper portion of each rack forming a continuous curve, a platen-carrying shaft traversing said slots, a platen carried thereby, pinions fixed one to and near each outer end of the shaft, a dog pivoted on the shaft and adapted to engage one of said racks, and means for throwing the dog into or out of engagement with said rack.

7. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots, the upper portion of each rack forming a continuous curve, a platen-carrying shaft traversing said slots, a platen carried thereby, pinions fixed one to and near each outer end portion of the shaft, a rotating dog having two ends either of which is adapted to engage one of said racks and thereby lock one of said pinions from rotation, and a lever adapted to impart rotatory movement in either direction to said pinion.

8. In a baling-press, a press-box having in each of its sides a slot, toothed racks arranged one adjacent each of said slots, the upper portion of each rack forming a continuous curve, a platen-carrying shaft traversing said slots, a platen carried thereby, pinions fixed one to and near each outer end portion of the shaft, a rotatory dog having two ends either of which is adapted to engage one of said racks and thereby lock one of said pinions from rotation, and a lever pivotally hung on said shaft and adapted to impart rotatory movement in either direction to said pinion.

9. In a baling-press, a press-box, a toothed rack secured thereto, the lower portion of the rack being substantially vertical and the upper portion continuously curved, a pinion in mesh with the rack, a platen, and means operated by said pinion for raising or lowering said platen.

10. In a baling-press, a press-box, a toothed rack secured thereto, the lower portion of the rack being substantially vertical and the upper portion forming the arc of a circle, a pinion in mesh with the rack, and a platen to which rising and falling movements are imparted by reason of similar movements of the pinion.

11. In a press, a press-box, hooks secured thereto, a platen reciprocable within said box, means for reciprocating it, and means secured to the platen and adapted to engage the hooks as the platen rises.

12. In a press, a press-box, hooks secured thereto, a platen reciprocable within the box, means for reciprocating it, and means projecting from the rear edge of the platen and adapted to engage said hooks and thereby tilt the front edge of the platen upwardly at the final portion of its rising movement.

13. In a press, a press-box having in one of its sides a slot the lower portion of which is substantially vertical and the upper portion of which is continuously curved, a shaft one end of which travels in said slot, the other end of the shaft traveling likewise, means for raising and lowering the shaft, and a platen carried by the shaft.

In testimony whereof we hereunto affix our signatures this 24th day of November, 1916.

AXLE BENSON.
EDWARD C. SHAW.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."