

O. L. BOWERS.
BALING PRESS.

APPLICATION FILED MAR. 5, 1910.

Patented Apr. 11, 1911.

2 SHEETS-SHEET 1.

988,969.

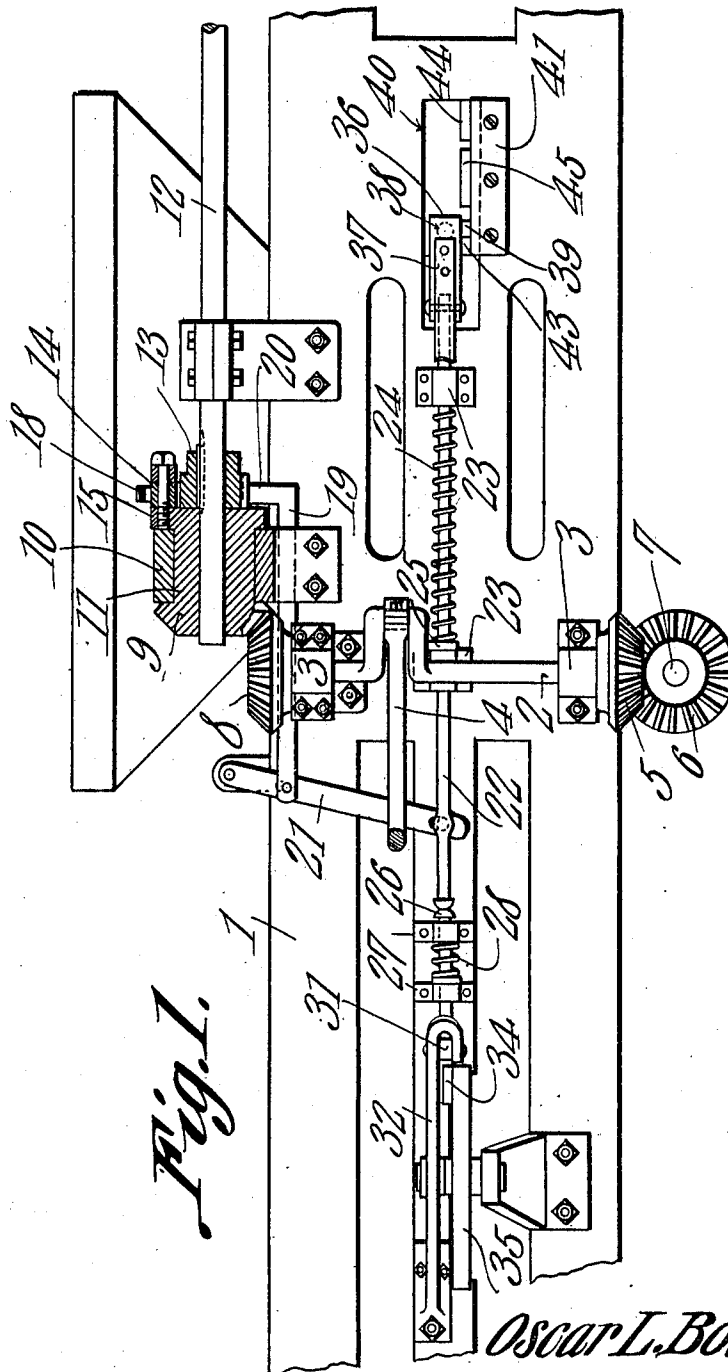


Fig. 1.

Witnesses

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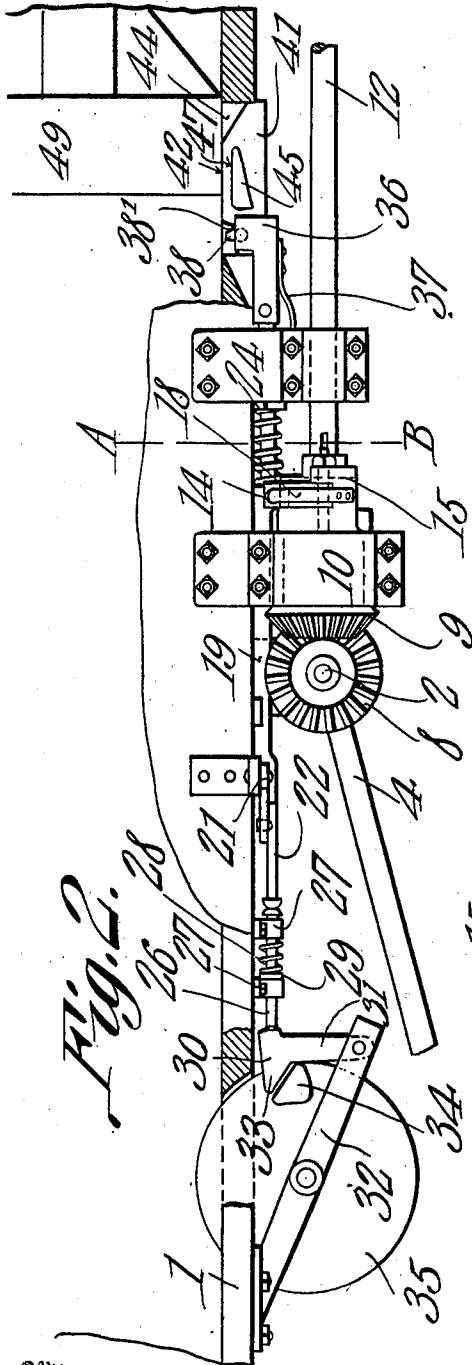


Fig. 2.

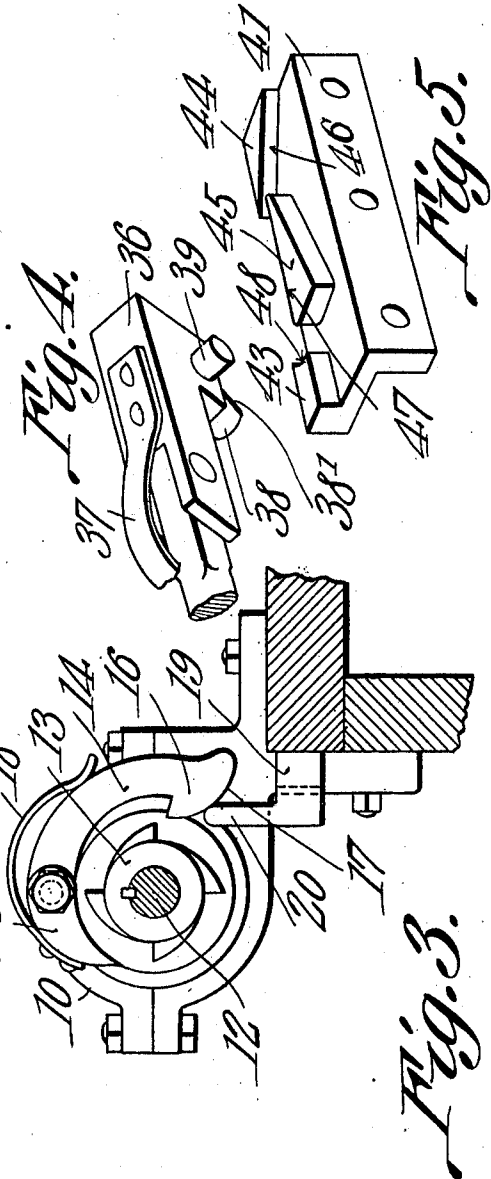


Fig. 3.

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

OSCAR L. BOWERS, OF WILLARD, ILLINOIS.

BALING-PRESS.

988,969.

Specification of Letters Patent. Patented Apr. 11, 1911.

Application filed March 5, 1910. Serial No. 547,467.

To all whom it may concern:

Be it known that I, OSCAR L. BOWERS, a citizen of the United States, residing at Willard, in the county of Alexander and State of Illinois, have invented new and useful Improvements in Baling-Presses, of which the following is a specification.

This invention has reference to improvements in baling presses of the class wherein wire strands are conveyed about the compressed material and their ends are united to bind the material in bale form.

The present invention relates more particularly to means whereby the mechanism for carrying the wire around the follower end of the bale shall be operated in such time relation to the movement of the follower that the needles or conveyers for the wire shall traverse the baling chamber only when the follower is being retracted thus preventing any chance of the follower engaging and breaking or otherwise injuring the wire-carrying devices.

In accordance with the present invention the arms which carry the wire across the baling or compression chamber traverse such chamber and are retracted by connections between these arms and the follower, which connections become active only on the retracting movement of the follower.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,—

Figure 1 is a side elevation of so much of a baling press as is necessary for the understanding of the present invention, the structure embodying the present invention being shown applied to the press, with some parts in section. Fig. 2 is a plan view with parts in section of the structure shown in Fig. 1. Fig. 3 is a section on the line A—B of Fig. 2. Fig. 4 is a perspective view of a reciprocatory member engaged by the follower to cause the movement of other devices. Fig. 5 is a perspective view of a cam structure with which the structure of Fig. 4 co-acts.

The baling press may be of the same general character as disclosed in Letters Patent #942,305, granted Dec. 7, 1909, for improvements in automatic wire tying machines, upon an application filed by me.

Referring to the drawings there is shown the body 1 of a baling press such as disclosed

in the said Letters Patent, and while the present invention is designed more particularly for use in connection with the structure disclosed in said Letters Patent it is to be understood that it may be used in connection with other wire tying mechanism and therefore is not limited to the particular form of press set forth in said Letters Patent.

On one side of the press body 1 is a crank shaft 2 journaled in suitable bearings 3, and this shaft is connected by a pitman 4 to suitable wire-carrying arms such as shown in the aforesaid Letters Patent. It will be understood that each time the crank shaft 2 is rotated the wire-carrying arms are caused to enter and traverse the baling chamber to carry the wire around the follower end of the formed bale to the twisting and cutting mechanism and then these arms are withdrawn while a new bale is being compressed.

The lower end of the shaft 2 carries a bevel pinion 5 in mesh with another bevel pinion 6 on a shaft 7 extending under the bottom of the baling chamber 1 to the other side of the machine where, as disclosed in the aforesaid Letters Patent, the wire-tying mechanism is located and this shaft 7 transmits power to such wire-tying mechanism.

The upper end of the shaft 2 carries a bevel pinion 8 in mesh with another bevel pinion 9 mounted in a journal bearing 10. The pinion 9 is formed with a hub 11 and is mounted on one end of a drive shaft 12 receiving power from any appropriate source located at any appropriate point on the machine, but the means for driving the shaft 12 has been omitted from the drawings. The pinion 9 is normally disconnected from the shaft 12 but provision is made for imparting rotative motion to the pinion 9 by means of a ratchet wheel 13 keyed to the shaft adjacent to the hub of the pinion 9. A pawl 14, best shown in Fig. 3, is pivoted to the hub 11 which at an appropriate point is formed with an ear 15 for the support of this pawl. The end of the pawl is formed into a hook 16 adapted to engage any tooth of the ratchet wheel 13, and this pawl has its hooked end formed with a cam face 17 for a purpose which will presently appear. A spring 18 carried by the ear 15 and engaging the pawl 14 tends at all times to force its hooked end 16 into engagement with the teeth of the ratchet wheel 13 so that the shaft 12 being rotated, rotative

movement is imparted to the pinion 9, to the pinion 8 and thence to the shaft 2 and from the latter by way of the pinions 5 and 6 to the shaft 7.

5 Mounted in appropriate bearings on the exterior of the press box 1 is a slidable bar 19 having at one end a finger 20, which, when the bar is at one limit of its movement is in the path of the cam edge 17 of the
10 pawl 14, but when the bar is at the other limit of its movement then this finger 20 is out of such path and the spring 18 is then free to force the pawl into engagement with the ratchet wheel 13. The relation of the
15 finger 20 to the cam edge 17 of the pawl 14 is such that when the finger 20 is moved in the path of the pawl while the latter is being rotated by engagement with the ratchet wheel 13, the cam face 17 will ultimately en-
20 gage the finger 20 and the pawl will be moved against the action of the spring 18 until free from engagement with the teeth of the ratchet wheel 13 so that continued rotation of the shaft 12 will have no effect upon the
25 pinion 9.

The bar 19 is pivotally connected to one end of a lever 21 mounted on the box 1, and the other end of this lever is pivotally connected to a rod 22 mounted to move in the
30 direction of its length in suitable bearings 23. Between the bearings 23 the rod 22 is surrounded by a spring 24 at one end engaging one of the bearings 23 and at the other end engaging a collar 25 upon the rod 22,
35 the normal tendency of the spring being to move the rod 22 in a direction which will cause the bar 19 to maintain a position where the finger 20 is in the path of the cam end 17 of the pawl 14. That end of the
40 rod 22 adjacent to the lever 21, beyond which this end of the rod extends, is in the path of and normally engages a longitudinally slidable rod 26 mounted in bearings 27 and between these bearings surrounded by
45 a spring 28 one end of which engages one of the bearings and the other end of which engages a collar 29 on the rod 26 and tends to hold it at one limit of its movement of reciprocation in the bearings 27, away from
50 the rod 22. The end of the rod 26 remote from the rod 22 engages one side of a block 30 on one end of a pivoted arm 31 mounted at the other end in a bracket 32 fast on the box 1. That side of the block 30 remote
55 from that engaged by the rod 26 is formed into a cam 33 in the path of a cam block 34 on and near the periphery of a disk 35 mounted in the bracket 32 and extending a short distance into the baling chamber 1 in the path of the bale being formed therein.
60 The block 34 is so located that once in every revolution of the disk 35 caused by the travel of the material being formed into bales or already formed and being propelled
65 toward the discharge end of the press, the

cam end 33 of the block is engaged by the cam block 34 and the arm 31 is moved about its pivot in a direction to impel the rod 26 against the action of the spring 28 and impart a like movement to the rod 22
70 against the action of its spring 24. That end of the rod 22 remote from the rod 26 has pivotally mounted thereon a block 36 having a constant tendency in one direction about its pivot point transverse to the length
75 of the rod 22 by means of a spring 37 which may be made fast to the block 36 and engage the rod 22, or this spring may of course be made fast to the rod 22 and bear against the block 36. This block 36 is provided on one
80 side with a projecting pin 38 and on the face at right angles to that carrying the pin 38 the block 36 is provided with another pin 39.

Formed in the side of the box 1 on the follower end of the baling chamber is a pas-
85 sage 40 past which the follower moves when actively traveling and when being retracted. At one side of this opening 40 there is located a bracket 41 having one face 42 adja-
90 cent to the opening 40. On the face 42 of the bracket 41 near the corners thereof where the bracket enters the opening 40 are bosses or projections 43, 44, respectively, and between these bosses and located farther from one
95 edge of the face 42 than are the bosses 43 is another boss or projection 45. The boss 44 has an inclined edge 46 while the boss 45 is substantially triangular with one edge 47 parallel with but spaced from the inner edge
100 of the portion 42 of the bracket 41 while the apex of the triangular boss 45 is directed toward the inclined edge 46 of the boss 44 and the base of this triangular block 45 is directed toward the boss 43 but is spaced therefrom. That end of the boss 43 adja-
105 cent to the boss 45 is dished as indicated at 48 while the angles of the triangular block 45 are preferably rounded.

In the normal position of the parts the block 36 rests with the pin 39 against the
110 face 42 of the bracket 41 and also against the side of the boss 43 remote from the interior of the box 1, the pin 38 projecting toward the interior of said box. If now the rod 22 be moved toward the right as viewed
115 in Figs. 1 and 2 the pin 39 will ultimately pass from engagement with the boss 43 and will be coincident with the space between this boss 43 and the base end of the boss 45. The tendency of the spring 37 is to force the
120 block 36 in a direction which will carry the pin 39 into the space between the end of the boss 43 and the base of the boss 45 so that the pin 38 will project into the interior of the box 1 and the pin 39 will be carried
125 toward the inner edge of the face 42 between the same and the edge 47 of the boss 45. Continued movement of the rod 22 toward the right will cause the pin 39 to travel along the edge 47 of the boss 45 until ulti-
130

mately it is brought into contact with the inclined edge 46 of the boss 44 and the block 36 will then be forced against the action of the spring 37 to withdraw the pin 38 from within the box 1. Now movement of the rod 22 in the reverse direction will cause the pin 39 to travel along the inclined edge of the boss 45 and cause the pin 38 to be moved still farther from the interior of the box 1 so that when the pin 39 ultimately leaves the boss 45 a rapid retractive movement of the rod 22 will carry the pin 39 out of coincidence with the space between the base end of the boss 45 and the curved edge of the boss 43 and the pin 39 will be brought into engagement with said boss 43, at which point the retractive movement of the rod 22 ceases.

The movements of the rod 22 are brought about in the following manner. The progress of the material being formed into bales causes a rotative movement of the disk 35 by engagement therewith and at the proper time the block 34 is brought into engagement with the cam end 33 of the block 30 and a longitudinal movement of the rod 26 against the action of the spring 28 is caused and this imparts a sufficient extent of longitudinal movement to the rod 22 to bring the pin 39 into coincidence with the space between the end 48 of the boss 43 and the base end of the boss 45 when the spring 37 becomes active to turn the block 36 on its pivot connection with the rod 22 and the pin 38 is projected into the box 1 so as to be in the path of the follower of the baling press on its retractive movement. The dished end 48 of the boss 43 while permitting further movement of the rod 22 in the direction in which it was started will prevent a retractive movement of the rod 22 by the action of the spring 24, which latter constantly tends to hold the rod in its initial position. Now the follower on its retractive movement engages the pin 38 and moves the rod 22 against the action of the spring 24, at the same time rocking the lever 21 to an extent sufficient to cause a longitudinal movement of the bar 19 sufficient to carry the finger 20 out of the path of the pawl 14 when the spring 18 of the latter moves the pawl into the path of the teeth of the ratchet wheel 13, the shaft 12 being constantly rotated. The engagement of the hook end 16 of the pawl 14 with a tooth of the ratchet wheel 13 causes a rotative movement to be imparted to the gear pinion 9 and this through the pinion 8 causes a rotative movement of the crank shaft 2 and of the pinions 5 and 6 and shaft 7 sufficient to cause the wire-carrying arms to traverse the baling chamber and the wire-tying mechanism to be actuated, the parts being so proportioned that one complete rotative movement of the gear 9 is sufficient to cause these several operations. Before the gear 9 can com-

plete its one rotation the pin 39 has been brought into engagement with the inclined surface 46 of the boss 44 and the pin 38 has been withdrawn from engagement with the follower of the press and now the spring 24 becomes active to cause a retractive movement of the rod 22 when the pin 39 will engage the inclined surface of the boss 45 and the block 36 will be turned still farther on its pivot until on leaving the base end of the boss 45 the return movement of the rod 22 is sufficiently rapid to cause the pin to move past the space between the base end of the boss 45 and the curved end of the boss 43 so that the pin 39 is brought into engagement with that edge of the boss 43 remote from the baling chamber and the rod 22 comes to rest because of the engagement of the collar 25 with the adjacent bearing 23. Rettractive movement of the rod 22 has caused the lever 21 to rock in a direction to move the bar 19 sufficiently to bring its finger 20 into the path of the cam end 17 of the pawl 14. This movement has occurred before the shaft 12 and the pinion 9 (then coupled thereto) has made one complete rotation, so that the pawl 14 is disengaged from the ratchet wheel 13 on the completion of a single rotation of the gear wheel 9. Since the coupling of the gear wheel 9 to the shaft 12 can take place only on the movement of the rod 20 when positively engaged by the follower on its retractive movement, the wire-carrying arm cannot be caused to traverse the baling chamber except when the follower is moving away from said baling chamber on its inactive direction of travel and therefore there can be no danger of injury to the arms carrying the wire for under no circumstances can the follower engage such arms.

The follower is indicated at 49 in Fig. 2.

The pin 38 may be beveled as shown at 38' on the side remote from the side engaged actively by the follower; or the pin may be otherwise formed so that, should the parts get out of proper timed relation and the block 36 become so situated with relation to the bosses 43 and 45 that the pin 38 is moved into the path of the follower 49 on its active or compression movement, the block 36 will be simply forced out of the baling chamber on the forward or active movement of the follower, thus preventing injury to the structure.

What is claimed is:—

1. In a baling press, a power shaft, means driven thereby, a normally inactive coupling between the power shaft and the means driven thereby, a slidable bar having means for controlling the coupling, a reciprocatory rod coupled to said sliding bar, a spring for giving the rod a normal tendency in one direction, a cam under the control of the material being baled for giving an initial

movement to said bar against the tension of said spring, an engaging member for the follower of the press on its inactive movement carried by said bar, and means for causing the movement of the engaging member on the reciprocatory movement of the rod.

2. In a baling press, a power shaft, means driven thereby, a normally inactive coupling between the power shaft and the means driven thereby, a slidable bar having means for controlling the coupling, a reciprocatory rod having a normal tendency in one direction and coupled to said sliding bar, means under the control of the material being baled for giving an initial movement to said bar against its normal tendency, an engaging member for the follower of the press on its inactive movement carried by said bar, and means for causing the movement of the engaging member on the reciprocatory movement of the rod for causing the engaging means to move into and out of the path of the follower.

3. In a baling press, a power shaft, means driven thereby, a pawl and ratchet coupling between the power shaft and the means driven thereby, a slidable bar having a finger adapted to disengage the pawl from the ratchet, a reciprocatory rod connected to said sliding rod, a pivoted engaging member on said bar, and a guide for said pivoted member for directing the latter into and out of the path of the follower on the reciprocatory movement of the rod.

4. In a baling press, a power shaft, means driven thereby, a pawl and ratchet coupling between the power shaft and the means driven thereby, a slidable bar having a finger adapted to disengage the pawl from the ratchet, a reciprocatory rod connected to said sliding rod, a pivoted engaging member on said bar, a guide for said pivoted member for directing the latter into and out

of the path of the follower on the reciprocatory movement of the rod, and means for imparting an initial movement to the rod comprising a rotatable disk in the path of the material being baled, an actuating member on said disk, and a slidable rod having a limited movement under the action of said actuating member of the disk and in turn engaging the first named slidable rod to impart an initial movement thereto for directing the pivoted member on said rod into the path of the follower.

5. In a baling press, a power shaft, means driven thereby, a normally inactive coupling between the power shaft and the means driven thereby, a slidable bar having means movable into and out of active relation to the coupling for controlling the latter, a reciprocatory rod having a normal tendency in one direction and connected to said sliding rod, a pivoted engaging member on one end of said bar movable into and out of the path of the follower of the press, a guide for said pivoted member for directing the latter into and out of the path of the follower on the reciprocatory movement of the rod, and means for imparting an initial movement to the rod in opposition to its normal tendency comprising a rotatable disk in the path of the material being baled, an actuating member on said disk, and a slidable rod having a limited movement under the action of said actuating member of the disk and in turn engaging the first named slidable rod to impart an initial movement thereto for directing the pivoted member on said rod into the path of the follower.

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

OSCAR L. BOWERS.

Witnesses:

JOHN A. BELL,
A. A. MYRICK.