J. R. EVANS AND F. H. G. BRANDT.

BALING PRESS.

APPLICATION FILED NOV. 25, 1916. RENEWED JULY 31, 1919.

1,333,067. Patented Mar. 9, 1920.

2 SHEETS—SHEET 1.

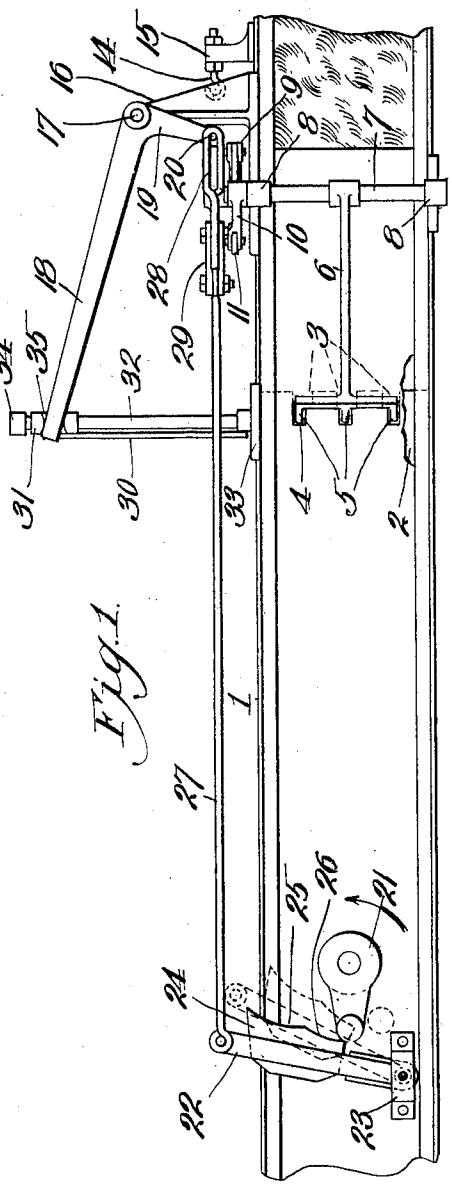


Fig. 1.

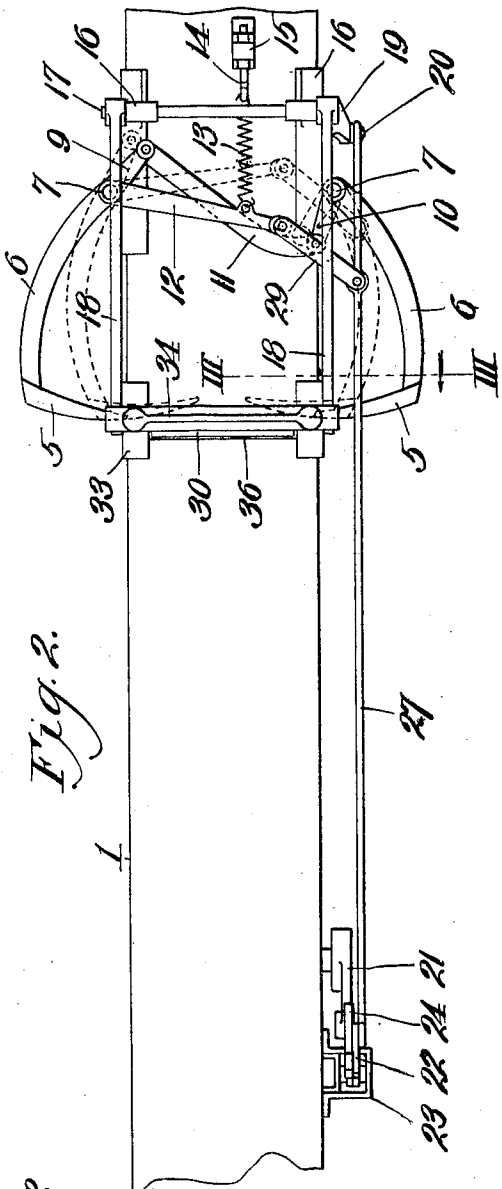


Fig. 2.

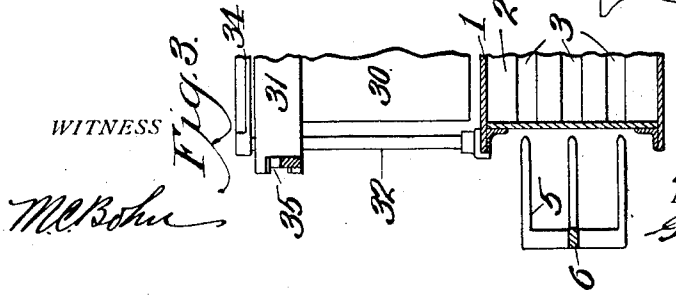


Fig. 3.

WITNESS

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2 SHEETS—SHEET 2.

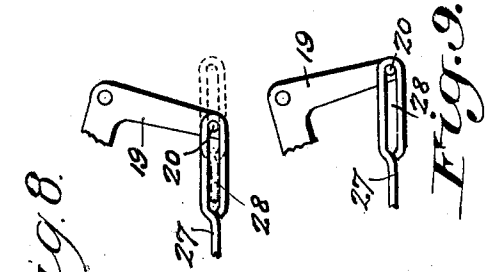


Fig. 8.

Fig. 9.

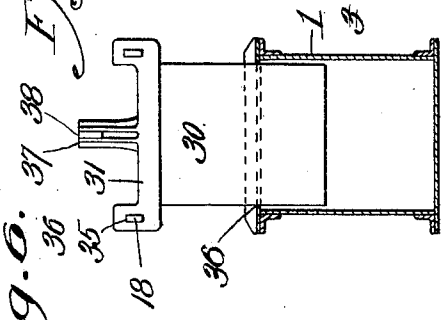


Fig. 6.

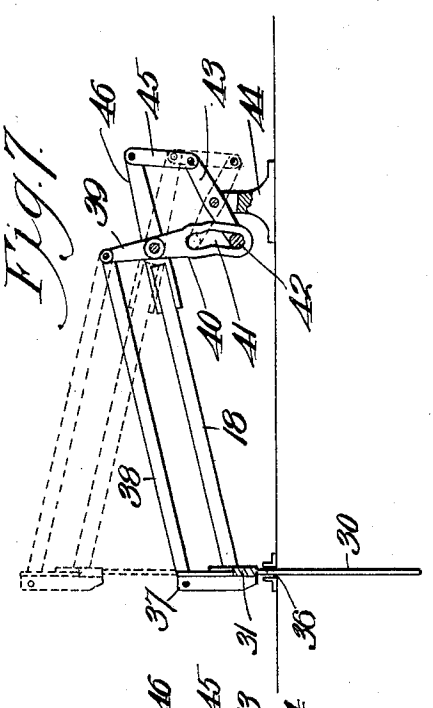


Fig. 7.

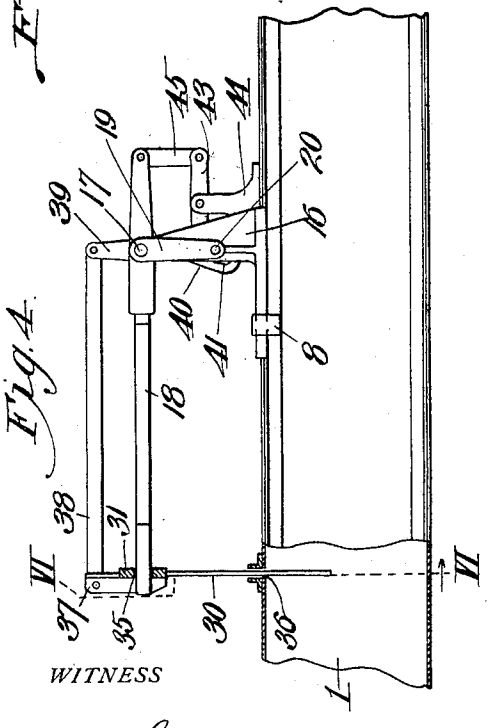


Fig. 4.

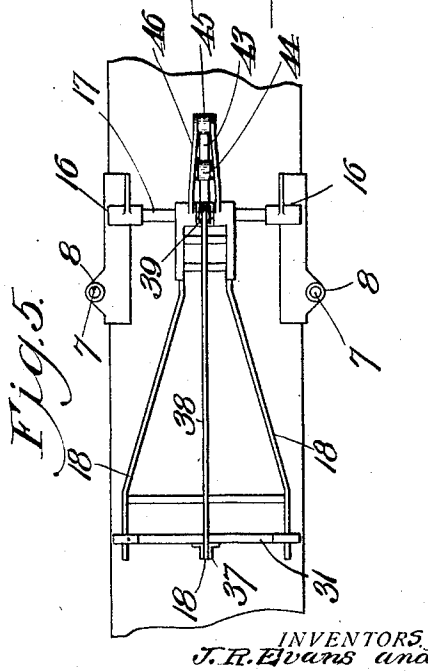


Fig. 5.

WITNESS

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UNITED STATES PATENT OFFICE.

JOHN R. EVANS AND FOKKO H. G. BRANDT, OF KANSAS CITY, KANSAS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO KANSAS CITY AUTOMATIC HAY PRESS COMPANY.

BALING-PRESS.

1,333,067. Specification of Letters Patent. Patented Mar. 9, 1920.

Application filed November 25, 1916. Serial No. 133,825. Renewed July 31, 1919. Serial No. 314,422.

To all whom it may concern:

Be it known that we, JOHN R. EVANS and FOKKO H. G. BRANDT, citizens, respectively, of the United States and Germany, and residing at Kansas City, in the county of Wyandotte and State of Kansas, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification.

This invention relates to baling presses and more especially to improvements in the material folding or tucking and retaining elements of such presses, and the object is to produce coöperating folding and retaining elements which will insure the production of neatly finished bales.

With this general object in view, the invention consists in certain novel and peculiar features of construction and combinations of parts as hereinafter described and pointed out in the appended claims, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which,—

Figure 1, is a fragmentary side elevation of a baling press equipped with mechanism embodying the invention.

Fig. 2, is a top plan view of the same.

Fig. 3, is a vertical section on the line III—III of Fig. 2.

Fig. 4, is a fragmentary side elevation of a press equipped with a modified form of folder operating mechanism.

Fig. 5, is a top plan view of the construction shown by Fig. 4.

Fig. 6, is a vertical section taken on the line VI—VI of Fig. 4.

Fig. 7, is a detailed side view showing the modified form of folding mechanism in different positions from that in which it appears in Fig. 4.

Figs. 8 and 9, are diagrammatic views for showing different operative positions of certain elements of the invention.

Referring now to the drawings in which like reference characters identify corresponding parts, 1 is a baling press of any suitable or preferred type and adapted to be provided with a suitable hopper, not shown, from which the baling material is delivered to the baling chamber. 2 is the reciprocatory head block or plunger for operating in the baling chamber to compress the material into bales, and said head block is provided with a plurality of cross grooves 3 in its front end respectively occupying the same horizontal planes as a corresponding number of openings 4 in opposite sides of the baling chamber or case, just rearward of the forward limit of movement of the head-block or plunger, as will be noted by reference to Fig. 1, in which figure the plunger is indicated at the limit of its forward or power stroke, the particular means for operating the plunger is immaterial as regards the novel features of this invention and is therefore omitted.

Arranged at opposite sides of the baling case and adapted for swinging into or out of the same through the respective openings 4, are fork-shaped retainers 5, said retainers being secured to the rear ends of a pair of horizontal swing arms 6 rigidly secured on vertical shafts 7 journaled in bearings 8 secured to the baling case in any suitable manner. One of the swing arms 6 is formed with a crank arm 9 projecting forwardly and inwardly from its respective shaft 7. The other swing arm 6 is provided with an inwardly and rearwardly projecting crank arm 10 connected pivotally to crank arm 9 by a horizontal link 11, the arrangement being such that inward or outward rotation imparted to one of the swing arms, imparts like movement to the other. To impart inward movement to the swing arms and hence to the retainers 5, a crank arm 12 secured to the upper end of one of the shafts 7, is connected to the rear end of a retractile spring 13 connected to an adjustable hook 14 mounted in a bearing standard 15 secured upon the press. The retainers and the means for securing the same in the baling case are adapted for coöperative relation with both types of folder mechanism shown and are omitted from the drawings illustrating the modified form of folder.

Cast integral, by preference, with the up-

per bearings 8 are upwardly projecting bearing standards 16, and journaled in said standards is a transverse rock shaft 17 provided with rearwardly projecting crank arms or levers 18 and a depending crank arm 19 having an outwardly projecting pin 20.

At a suitable distance rearward of the retainers and at one side of the case is a suitably journaled and driven crank 21, the same being adapted once in each revolution to effect outward movement of the retainers and downward movement of the folder hereinafter described. To accomplish this result, a lever 22 is pivotally mounted at its lower end in a suitable bearing or keeper 23 secured to the baling case, and is equipped with a plate 24 having its front edge divided in a cam face 25 and a face 26 for successive engagement by said crank arm 21, and the upper end of the lever is pivotally connected to a rod 27 provided with a longitudinal slot 28 engaged by the crank-arm pin 20, and said link rod 27 is pivotally connected by a link 29 with the free end of the crank arm 12, the connection of the link with the said crank arm being preferably a pin-and-slot connection to provide for a limited amount of play between said link and crank arm.

The crank arm 21 rotates in the direction indicated by the arrow Fig. 1, and as the outer end of the arm passes a position vertically above its axis of movement, said end engages the cam face 25 and swings the lever 22 rearward, this action as hereinbefore explained raising the lever 18 and swinging the retainers outward. As the end of said crank 21 passes into engagement with the face 26 of plate 24 and until it clears said face, the lever 22 is retained in the position to which it was forced by the action of the arm on the face 25, the lever retaining this position because the curvature of face 26 at such time is concentric to the axis of said cam arm. It will therefore be understood that the retainers and folder are held withdrawn from the baling case during the travel of the crank arm 21 upon the face 26 of lever 22.

Arranged to operate in a vertical plane just rearward of the retainers is a reciprocatory folder 30. In Sheet 1, the folder is secured to and depends vertically from a cross head 31 mounted slidingly on a vertical guide frame, said frame comprising a pair of vertical posts 32 mounted in base plates 33 secured to the case and a cross bar 34 connecting the upper ends of the posts. The cross head 31 is provided with end notches 35 receiving the rear ends of levers 18, and the top of the baling case is provided with a cross slot 36 through which the folder operates in making its folding and return strokes, it being understood that the parts are so proportioned that the folder travels nearly to the bottom of the case in its power or folding stroke.

In operation the plunger makes its strokes in the formation of the bale while the retainers and folder occupy their inoperative positions as shown by full lines Sheet 1, that is while the crank arm 21 is operating on the face 26 of lever 22, the plunger is advanced as indicated in Fig. 1. As the crank arm rides off the lower end of face 26, spring 13 retracts and swings the retainers into the case and into the grooves 3 of the plunger behind the bale, the power of the spring incidentally swinging the lever 22 to the position shown by dotted lines Fig. 1, and therefore permitting the folder to drop down through the slot 36 of the baling case until it is arrested by contact with the upper side of the plunger. Immediately these actions take place, the plunger is withdrawn and the folder resumes its downward movement without opposition because the operation of the retainers advances the slotted rod 27 to substantially the position shown by dotted lines Fig. 8, with respect to the pin 20 of crank arm 19, the dropping of the folder after the withdrawal of the plunger advancing said pin 20 to the position shown by Fig. 9. The folder in its second or continued downward movement serves to fold downward that portion of the baling material which projects rearwardly from the upper side of the bale over the top of the plunger, there always being a space between the top of the baling case and the plunger in order to insure freedom of the latter in its reciprocatory action. Said projecting portion of the baling material is therefore folded downward behind the retainers and is held in such position until another charge of hay is pressed against it or if the bale is complete, until bale tie wires are arranged in the usual or any preferred manner, horizontally around the bale, it being understood that the wires of course will inclose the folder as well as the said folded material but that the wires do not inclose the folder with sufficient force to interfere with its reëlevation as the crank arm in its next revolution engages the cam face 25 and forces the lever 22 rearwardly from the position shown by dotted to the position shown in full lines, Fig. 1. It will be noted that in this operation of the lever, rod 27 swings the crank 19 rearwardly and incidentally effects the withdrawal of the retainers by pulling forward through link 29 on crank arm 12. Immediately the retainers and folder are returned to inoperative position, the bale is free to expand until restrained by the encircling tie wires.

Referring now to Sheet 2, it will be noticed that the stationary folder-guide frame upon the baling case is omitted. The levers 18

in this instance extend through openings 35, in the cross head 31 carrying the folder, and said cross head is provided with an upwardly projecting arm 37 in which is pivoted the front end of a link 38 pivoted at its rear end to the upwardly projecting arm 39 rigid with levers 18, said levers are also provided with a depending crank arm 40 provided with a substantially angular slot 41 engaged by a roller 42 on the rear end of a rock lever 43 mounted in a bifurcated standard 44, and the front end of said rock lever is pivotally connected by a link 45 with the forwardly projecting crank arm 46 of said levers.

When the crank arm 19 of transverse shaft 17 is unrestrained by the slotted rod 27, the folder drops down as before upon the plunger and when the plunger withdraws the folder continues its downward movement to substantially the position shown by full lines Fig. 7, the connections between levers 18 and link 38 through crank arm 40, rock arm 43, link 45, crank arm 46 and crank arm 39, insuring vertical downward movement of the folder. As the lever 22 is swung back to the position shown in full lines, Fig. 1, the slotted rod imparts rearward movement to crank arm 19 and thereby reëlevates the folder, and through the same connections above identified the folder is caused to move vertically upward to substantially the position shown by dotted lines Fig. 7, it being noticed in this connection that Fig. 4 shows the folder in a position intermediate of its reciprocatory travel.

When the folder is nearly depressed, the roller 42 is disposed in the lower end of the angular slot 41, and when the folder is completely elevated said roller occupies the upper end of said slot. When the folder is about the middle of its travel the roller is at the bending point of said slot.

From the above description it will be apparent that we have produced a baling press provided with a folder which will tuck downward against the rear end of each bale all of the loose material normally forming a ragged projection at the upper corner of the rear end of the bale and not secured against the same by the baling wires, and while we have illustrated and described the preferred embodiments of the invention, it will be apparent that it is susceptible of change in minor particulars without departing from the spirit and scope of the appended claims.

We claim:

1. The combination in a baling press, of a reciprocatory folder for operating in a vertical plane into and out of the baling chamber of the press, a lever connected to the folder to move the same into and out of the baling case, a rod having a pin-and-slot connection with said lever, to operate the same to withdraw the folder from the baling case, and means to position said rod to permit the folder to make its operative stroke into the baling case.

2. The combination in a baling press, of a reciprocatory folder for operating in a vertical plane into and out of the baling chamber of the press, a lever connected to the folder to move the same into and out of the baling case, a rod having a pin-and-slot connection with said lever, to operate the same to withdraw the folder from the baling case, means to position said rod to permit the folder to make its operative stroke into the baling case, a rock lever pivotally connected to said rod, and a rotating device to operate said lever to effect the withdrawal of the folder from the baling case and subsequently release said lever to permit the folder to move into the baling case.

3. The combination in a baling press, of a reciprocatory folder for operating in a vertical plane into and out of the baling chamber of the press, a lever connected to the folder to move the same into and out of the baling case, a rod having a pin-and-slot connection with said lever to operate the same to withdraw the folder from the baling case, means to position said rod to permit the folder to make its operative stroke into the baling case, a rock lever pivotally connected to said rod, a rotating cam arm to operate said lever to effect the withdrawal of the folder from the baling case and subsequently release said lever to permit the folder to move into the baling case, and yielding means for effecting longitudinal movement of said rod when said crank arm releases said rock lever to leave the folder free to make its stroke into the baling case.

4. The combination in a baling press, of a reciprocatory folder for operating in a vertical plane into and out of the baling chamber of the press, a lever connected to the folder to move the same into and out of the baling case, a rod having a pin-and-slot connection with said lever, to operate the same to withdraw the folder from the baling case, means to position said rod to permit the folder to make its operative stroke into the baling case, a rock lever pivotally connected to said rod, a plate secured to the rock lever and provided with adjacent bearing faces, and a rotating device adapted for engaging one of said faces to rock the lever and effect withdrawal movement of the folder from the baling case, and then engage the second of said bearing faces to maintain the folder in its withdrawn position for a predetermined period.

5. The combination with a baling press, of a transverse rock shaft suitably journaled above the baling case of the press, a lever projecting rearwardly from said rock shaft, a vertical folder to be raised by upward movement of said lever and to move downward with the latter, means for maintaining

the folder in an upright position during both of its movements, a crank arm secured to said rock shaft, a longitudinal rod provided with a slot slidingly engaging the crank, a rock lever mounted on the baling case and pivotally connected to said rod and a rotating device adapted once in each revolution to effect rearward movement of said last-named rock lever to raise the folder, and yielding means to swing said lever forward to its initial position after it is released by said device to leave the folder free to move downward into the baling case.

6. The combination with a baling press having opposite openings, a pair of shafts suitably journaled at opposite sides of the baling case, swing arms secured to said shafts, retainers secured to the swing arms for operation through said openings into and out of the baling case, means for operating said shafts to cause the retainers to enter the baling case, and continuously rotating means for periodically effecting reverse operation of said shafts and the withdrawal of the retainers.

7. The combination with a baling press having opposite openings, a pair of shafts, suitably journaled at opposite sides of the baling case, swing arms secured to said shafts, retainers secured to the swing arms for operation through said openings into and out of the baling case, means for operating said shafts to cause the retainers to enter the baling case, a rod actuated by movement in one direction by the means which effects movement of the retainers into the baling case, a lever connected to said rod and provided with a pair of bearing faces, and continuously rotating means for repressing said lever by engagement with one of the bearing faces thereof, to effect the withdrawal of the retainers from the case, then engage the other bearing face to maintain the retainers withdrawn and then pass out of engagement with said last-named bearing face to permit the retainers to reënter the baling case.

8. In a baling press, the combination of a baling case, a pair of retainers to operate back and forth into the baling case from opposite sides thereof, a folder to reciprocate into and out of the baling case adjacent said retainers, means for effecting withdrawal of the folder from the baling case, and for accommodating movement of the folder into the baling case, a rod having a pin and slot connection with said last-named means and connected to the retainers, yieldingly actuated means to project the retainers into the baling case and position said rod to permit the folder to move into the baling case, and means to return said rod to its original position to effect the withdrawal of the folder and retainers from the baling case.

9. In a baling press, the combination of a baling case, a pair of retainers to operate back and forth into the baling case from opposite sides thereof, a folder to reciprocate into and out of the baling case adjacent said retainers, means for effecting withdrawal of the folder from the baling case, and for accommodating movement of the folder into the baling case, a rod having a pin-and-slot connection with said last-named means and connected to the retainers, yieldingly-actuated means to project the retainers into the baling case and position said rod to permit the folder to move into the baling case, and means to return said rod to its original position to effect the withdrawal of the folder and retainers from the baling case and hold said rod in its last-named position for a predetermined time.

10. In a baling press, the combination of a baling case, a pair of retainers to operate back and forth into the baling case from opposite sides thereof, a folder to reciprocate into and out of the baling case adjacent said retainers, a rock shaft, a lever projecting from the rock shaft to withdraw the folder from the baling case and to move with the folder when it enters the baling case, a crank arm projecting from said rock shaft, a rod having a slotted connection with said crank arm, yieldingly-actuated means for swinging the retainers into the press and for imparting longitudinal movement to said rod to permit the folder to move into the baling case, and means for periodically reversing the movement of said rod to effect the withdrawal of the folder and retainers from the baling case.

11. In a baling press, the combination of a baling case having an opening, a suitably guided folder for operating into and out of said case through said opening, a plunger for baling material within the case, means connected to the folder to withdraw the same from the baling case to permit the plunger to advance baling material beyond said opening and then release the folder to permit it to drop down upon the advanced plunger and continue its fall after said plunger has been withdrawn, to fold loose material against the rear end of the bale of material.

12. In a baling press, the combination of a baling case having an opening, a suitably-guided folder for operating into and out of said case through said opening, a plunger for baling material within the case, means connected to withdraw the folder from the baling case to permit the plunger to advance baling material beyond the said opening and then release the folder to permit it to drop down upon the advanced plunger and continue its fall after said plunger has been withdrawn, to fold loose material against the rear end of the bale of material, in combination with retainers for operation into

and out of the case from opposite sides thereof, means for moving the retainers into the case while the plunger is advanced, and means actuated by the means which withdraws the folder from the baling case to effect the withdrawal of the retainers from the baling case.

In testimony whereof, we affix our signatures in the presence of two witnesses.

JOHN R. EVANS.
FOKKO H. G. BRANDT.

Witnesses:
M. C. BOHN,
G. Y. THORPE.