No. 765,533. PATENTED JULY 19, 1904.

R. P. WHITE.

BALING PRESS.

APPLICATION FILED OCT. 1, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

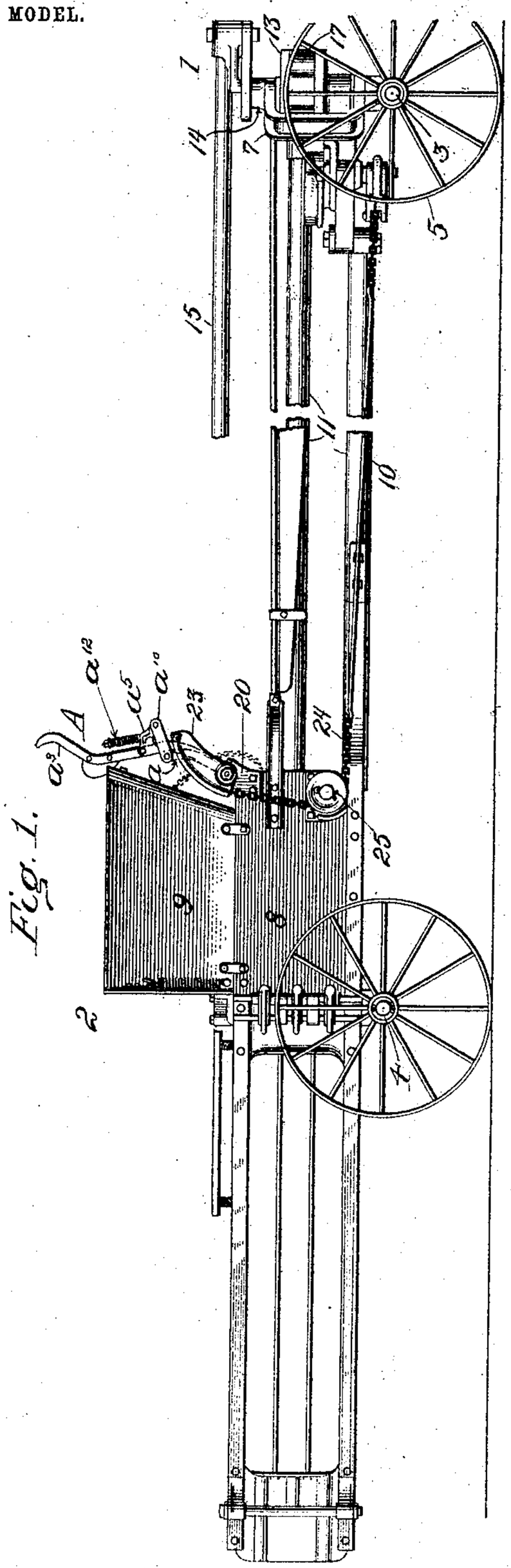

Fig. 1.

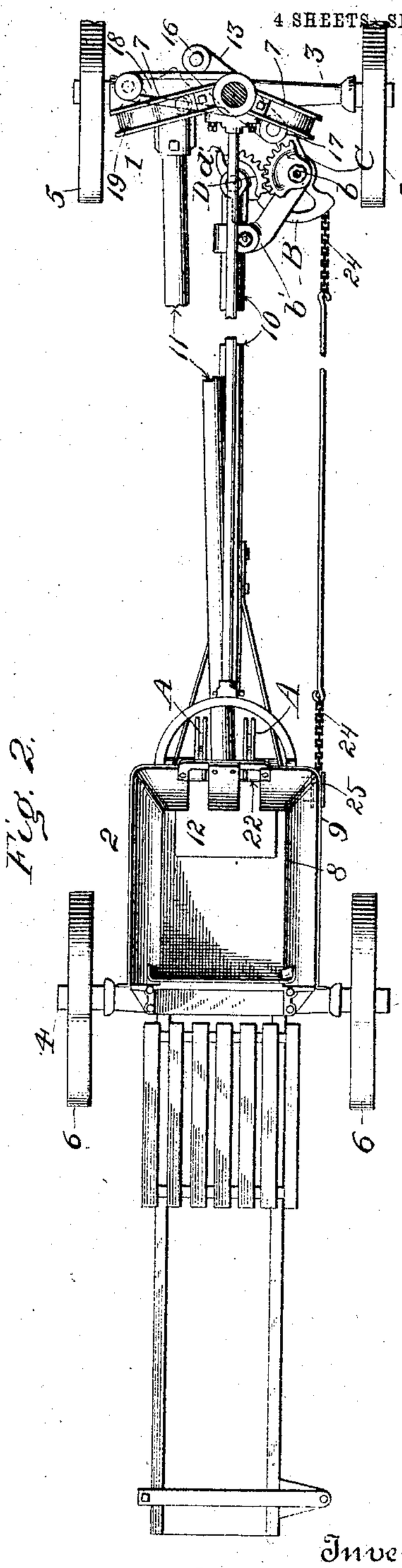

Fig. 2.

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E. E. Fowler

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NO MODEL. 4 SHEETS—SHEET 2.

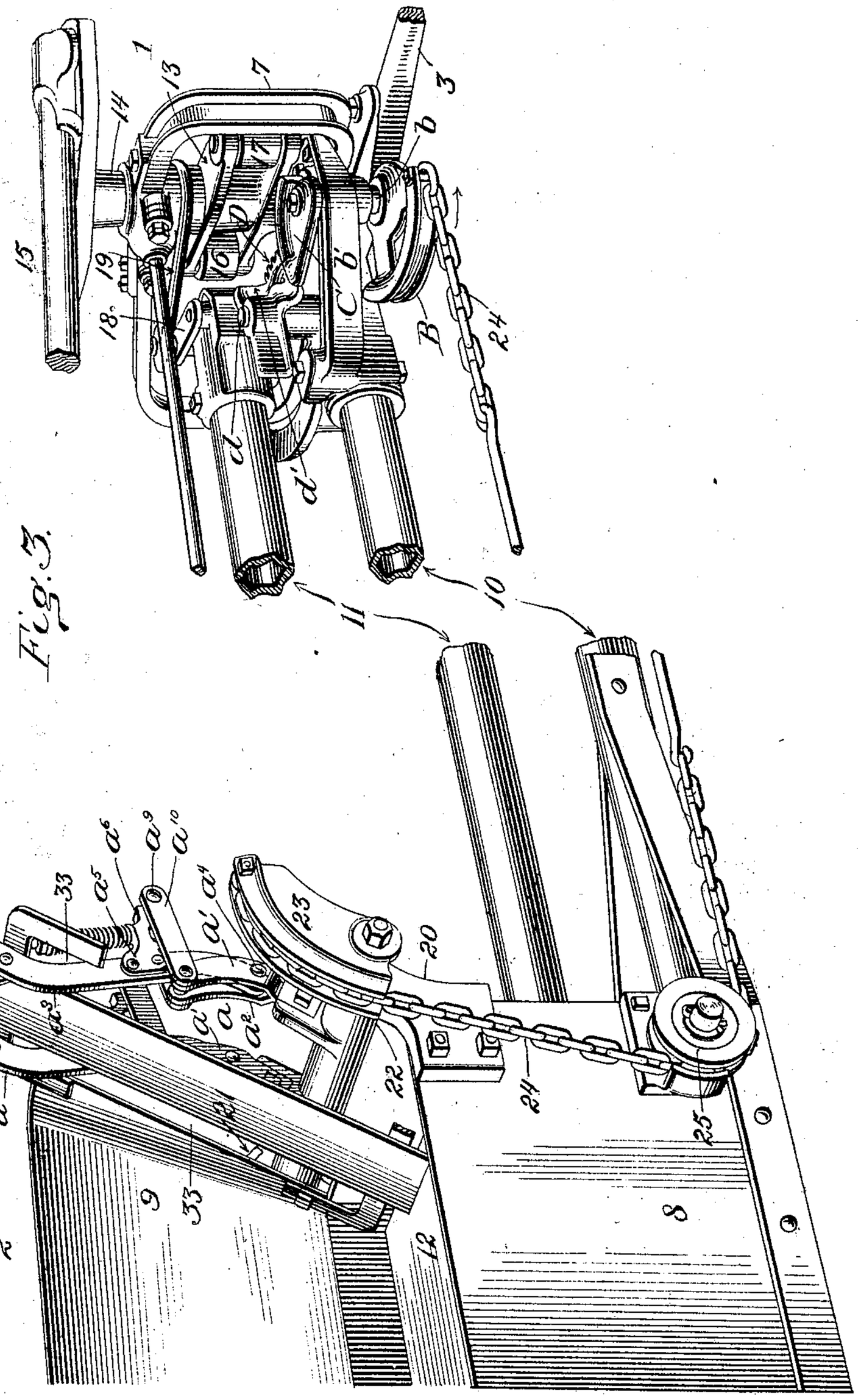

Fig. 3.

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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 4.

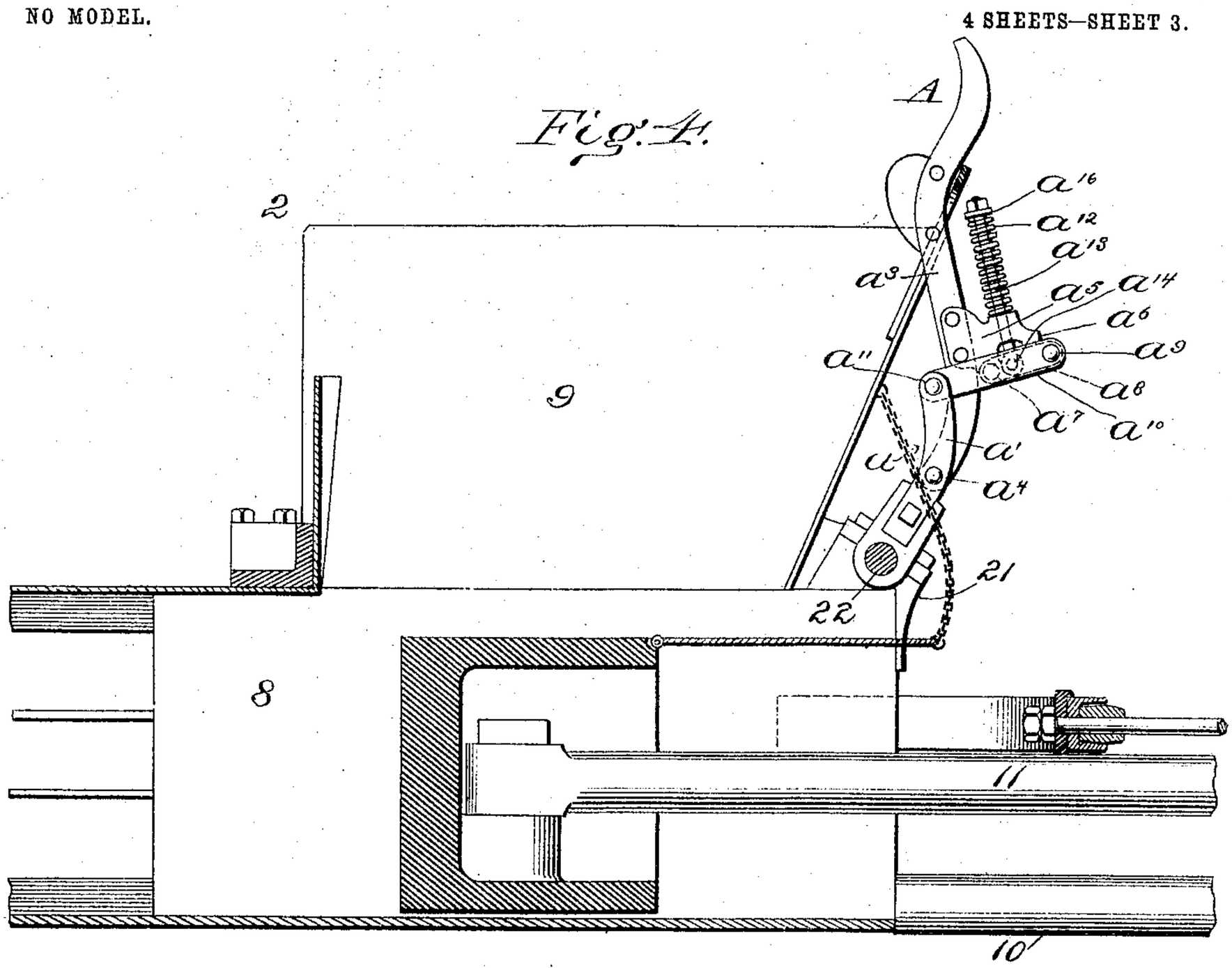
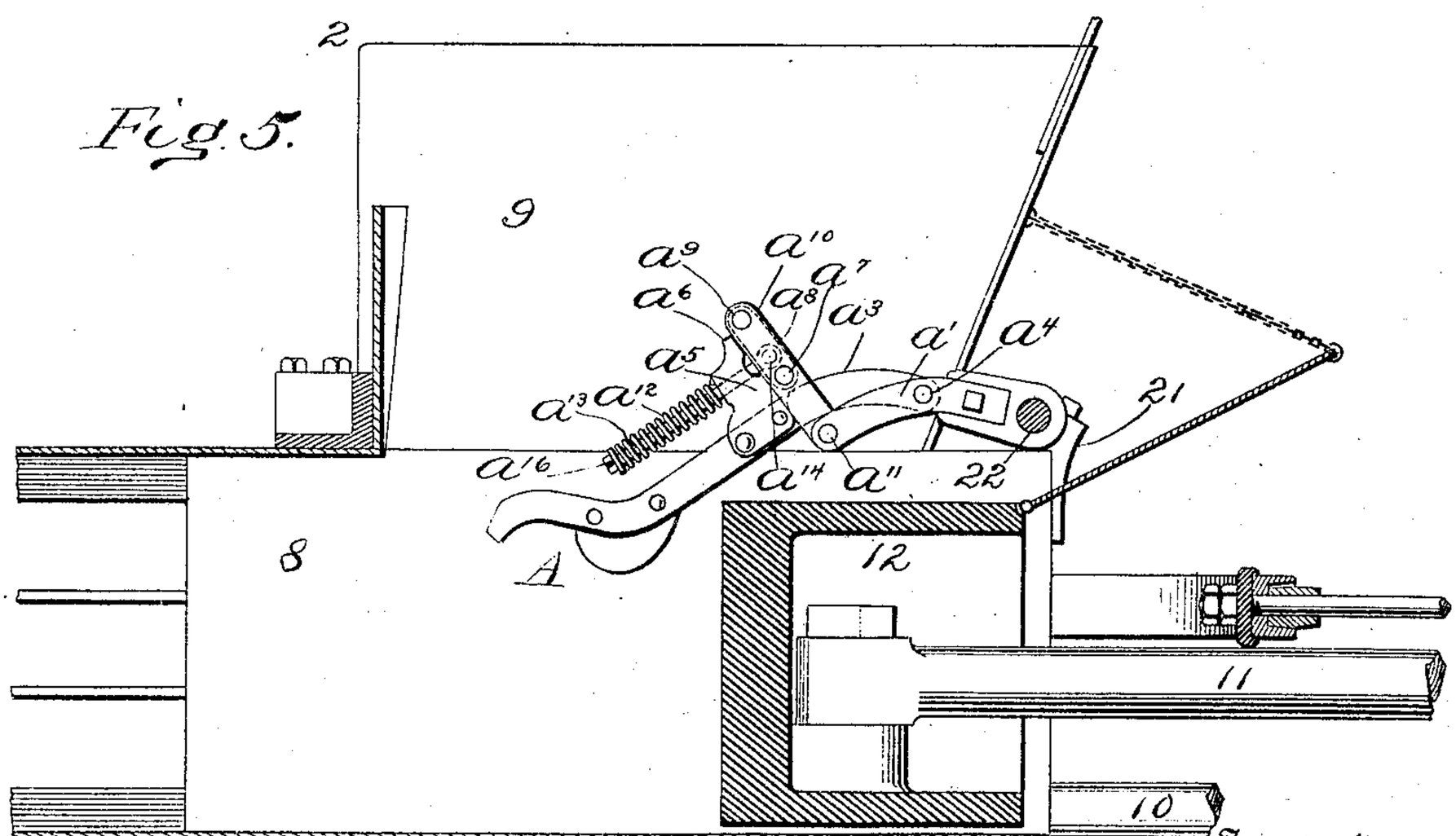


Fig. 5.



Witnesses
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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 6.

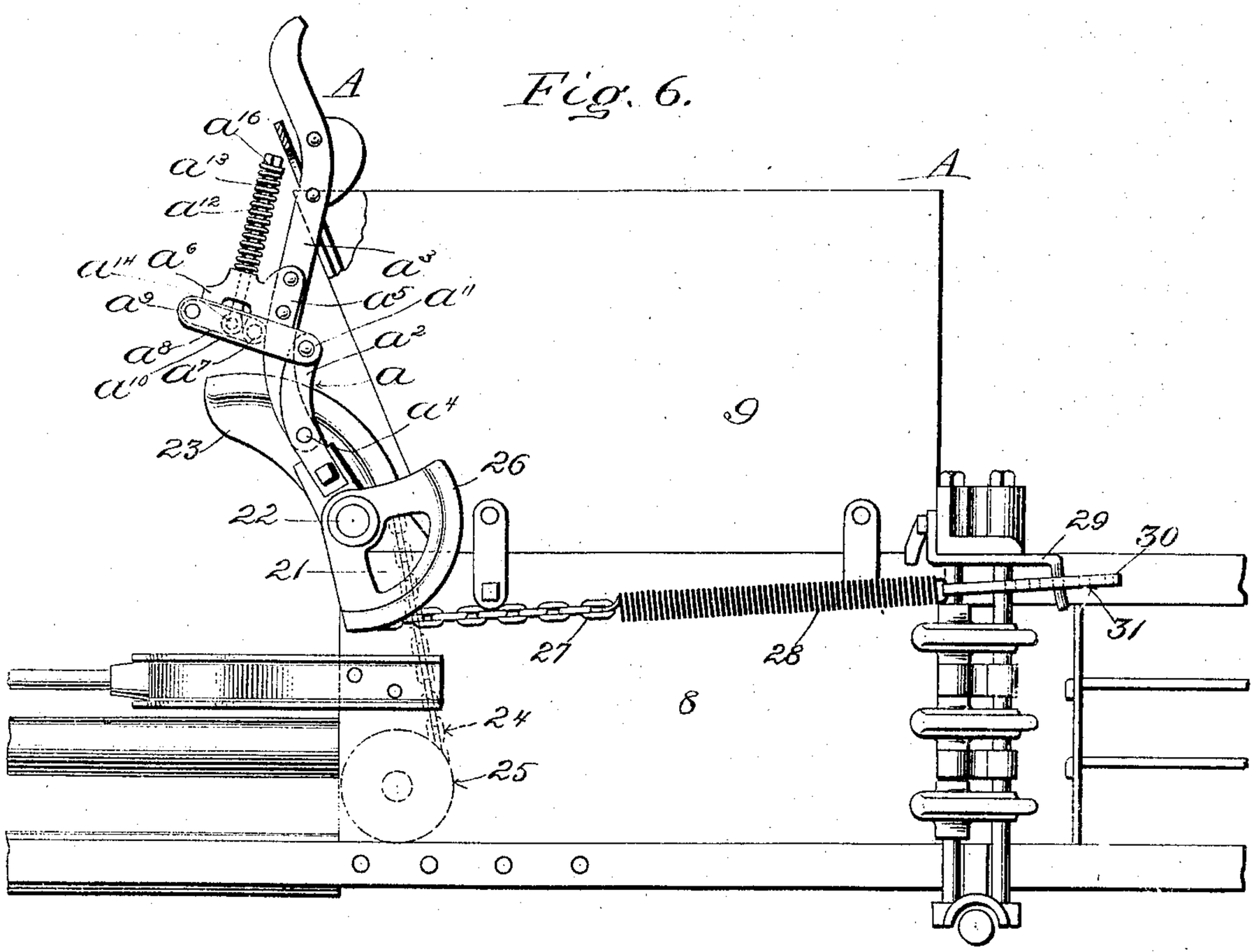
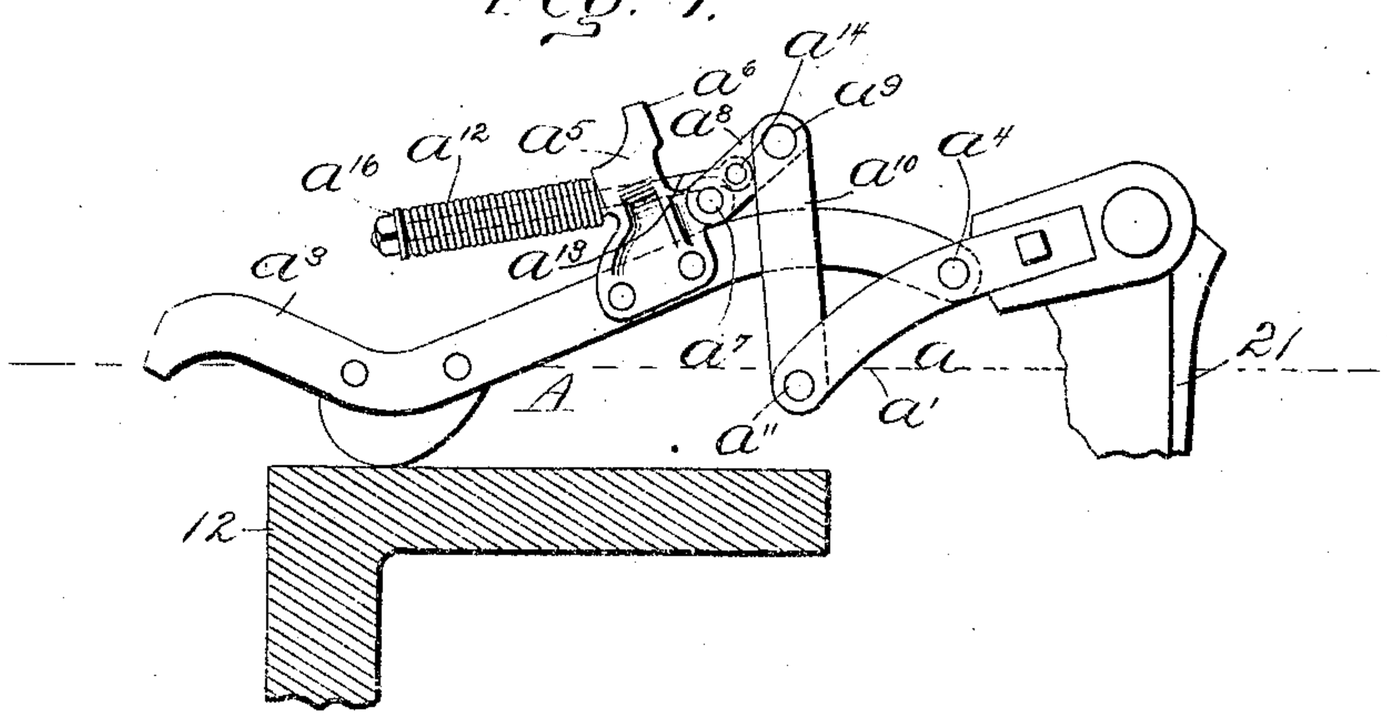


Fig. 7.



Witnesses
C. C. Bruce
C. C. Fowler.

Inventor
R. P. White
By Phil. T. Dodge
Attorney

No. 765,533. Patented July 19, 1904.

UNITED STATES PATENT OFFICE.

RALIEGH P. WHITE, OF KANSAS CITY, MISSOURI, ASSIGNOR TO EAGLE MANUFACTURING COMPANY, A CORPORATION OF MISSOURI.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 765,533, dated July 19, 1904.

Application filed October 1, 1903. Serial No. 175,295. (No model.)

To all whom it may concern:

Be it known that I, RALIEGH P. WHITE, of Kansas City, county of Jackson, and State of Missouri, have invented a new and useful Improvement in Baling-Presses, of which the following is a specification.

This invention has reference to presses designed more particularly for baling hay, straw, and like material, and embodying usually a baling-chamber, a hopper communicating therewith, and a plunger adapted to be operated by suitable means and acting within the baling-chamber on the successive charges of material entering from the hopper. In connection with machines of this character it is a common practice to provide mechanism for feeding the material into the baling-chamber, which mechanism acts to press the charge in the hopper well downward into the chamber, so that the full and proper amount will be carried with certainty forward by the advance of the plunger and compressed with the previous charges. It is to feeding mechanisms of this nature that my invention is principally directed; and it consists of feeding mechanism of improved form and construction, as will be more fully described in the specification and pointed out in the claims.

The invention consists also in improved mechanism for actuating the feeding device by the plunger-operating means.

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 a baling-press having my invention embodied therein. Fig. 2 is a top plan view of the same. Fig. 3 is a perspective view, on an enlarged scale, showing the "baling end" and "power end" of the press with the feeding mechanism in an inactive position. Fig. 4 is a vertical longitudinal sectional elevation through the baling-chamber, showing the feeding-arms in a raised inactive position. Fig. 5 is a similar view showing the feeding-arms lowered and in action. Fig. 6 is a side elevation of the baling-chamber as viewed from the side of the press opposite that shown in Fig. 1. Fig. 7 is a side elevation showing how the feeding-arm is tripped or yields when it encounters an obstruction.

Referring to the drawings, 1 represents the power end of the press, and 2 the baling end, which are sustained, respectively, by axles 3 and 4, provided with carrying-wheels 5 and 6, by which the press may be transported from place to place.

The power end of the press comprises a suitable frame or casting 7, in which the power mechanism presently to be described is mounted and by which it is given support, while the baling end of the press consists of a horizontal longitudinally-extending baling-chamber 8, open at its top at its front end for the introduction of the charges, at which point it is provided with a hopper 9, into which the material to be compressed is fed preparatory to entering the baling-chamber. The baling-chamber and the frame 7 are rigidly and firmly connected together by a longitudinal bar or beam 10.

12 represents a reciprocating plunger connected to the rear end of a pitman 11, which plunger is adapted when the pitman is reciprocated to enter the front end of the baling-chamber and to act on the charges of material introduced through the top opening from the hopper. At its opposite end the pitman is acted on by a rotary trip-lever 13, mounted on a vertical shaft 14, which is mounted in bearings in the frame 7 and which is operated in the usual manner by a sweep 15, connected with the upper end of the shaft.

The trip-lever is provided with friction-rollers 16 and 17, which as it revolves successively engage the end of the pitman, and maintaining engagement therewith through the medium of connecting-links 18 and 19 they force the pitman forward until it arrives at a predetermined point, where the active roller disengages it, and the pitman being released it quickly rebounds under the resistance offered by the compressed mass and returns to its former position ready to be engaged and carried again forward by the other roller.

The foregoing parts may be and are of the usual and customary construction, and ex-

cept in so far as hereinafter indicated they form no part of the present invention.

In applying my present invention I mount in bearings 20 and 21 on the forward end of the baling-chamber and above the path of the plunger a horizontal rock-shaft 22, which has fixed to one end a segment-sheave 23, to which is connected a chain 24, extending downward and around a guide-pulley 25 on the outside of the baling-chamber and finally forward to the power end of the press, where it is operatively connected with the sweep in such manner, as will be more fully described hereinafter, that it will be drawn forward intermittently by the action of the trip-lever as the latter is revolved by the sweep, thereby intermittently rocking the shaft 22. At its opposite end the shaft 22 has fixed to it, as shown in Fig. 6, a second segment-sheave 26, to which is connected one end of a chain 27, whose opposite end is connected with the forward end of a spiral spring 28, having its rear end adjustably connected with a bracket 29 on the side of the baling-chamber, the adjustable connection comprising a link 30 on the spring, provided with a number of holes 31, either adapted to be passed over a pin 32 on the bracket. The relative connection of the chains 24 and 27 with their respective sheaves is such that when the chain 24 is drawn forward and its sheave drawn downward the other sheave will also by reason of its connection with the shaft be drawn downward and will wind up its chain, which will place the spring under tension, so that when the strain on chain 24 is released the spring will draw the segment-sheave 26 upward to its former position. It will be seen, therefore, from the construction described that the intermittent pull on chain 24 will result in a corresponding rocking of the shaft 22.

Carried by shaft 22 are two feeding-arms A, which when the shaft is rocked downward, as described, will descend into and through the hopper and into the baling-chamber, the front of the hopper being slotted vertically, as at 33, to admit the arms. The function of these arms is to force the material introduced by the attendant into the hopper down through the opening into the baling-chamber, so that the charges will be properly fed in front of the plunger, and the arms are designed to act alternately with the advance of the plunger—that is to say, the arms descend to perform their functions after the plunger has rebounded, and they ascend and leave the chamber when the plunger advances to compress the charge. In order to effect this relative action of the parts, I prefer to adopt the mechanism shown particularly in Figs. 1 and 2 for operating the feeding-arms by the trip-lever. Here it will be seen that the forward end of chain 24 is connected with a horizontal segment-sheave B, fixed to the lower end of a vertical rock-shaft *b*, mounted in a bearing in a horizontal arm *b'*, fixed to the frame 7 and projecting rearwardly therefrom, the arrangement being such that when the sheave is turned outward it will wind the chain and draw it forward, thereby rocking the feeding-arm shaft 22 downward and depressing the feeding-arms on the charge in the hopper.

Fixed to the upper end of the vertical shaft *b* above the arm *b'* is a horizontal segment-gear C, whose teeth are adapted to mesh with the teeth on a second segment-gear D, mounted on the upper end of a vertical stud *d*, projecting upward from the base of the frame 7 at a point to one side of that where the pitman is disengaged from the trip-lever. The segment D is provided with a forwardly-extending nose *d'*, which projects in the path of the rollers of the trip-lever, the result being that when the active roller is disengaged from the pitman and the latter has rebounded the said roller will engage this nose and will turn the segment on its axis, thereby turning the intermeshing segment C and the segment-sheave B in the opposite direction, which action will wind chain 24 and cause the feeding-arms to descend into the hopper. The continued movement of the trip-lever will cause its roller to be disengaged from the nose *d*, and the segment being released the spring 28, acting on the feeding-arm shaft, will, through the connection of this shaft with the chain 24, draw the same quickly rearward, which action will turn the sheave B inward and restore the parts to their former positions, with the nose *d* in position to be engaged by the following roller. It is seen, therefore, that as the sweep is revolved and the trip-lever carried around the rollers will successively advance the pitman to press the charge and as the plunger rebounds will successively cause the feeding-arms to descend and force the next charge into the chamber, the action of the plunger and feeding-arms being thus alternate and both controlled by the operation of the trip-lever.

Owing to the fact that the plunger is not positively retracted, it frequently happens that by reason of an unusually large charge being carelessly allowed to pass under the "folder" or for other causes the plunger-head binds in the baling-chamber and remains beneath the opening through which the feeding-arms work, the result being that unless some means are provided to prevent the feeding-arms will contact with the plunger-head and will be broken or injury caused to some of the connected parts. In order to prevent this contingency, I propose to so construct the feeding-arms that they will yield when subjected to undue resistance—such, for instance, as an obstruction of this nature—so that the actuating mechanism will be permitted to operate without interruption and without injury to the feeding mechanism. In carrying out this idea I prefer to adopt the con-

struction shown in Figs. 3 to 7, where it will be seen that the feeding-arms are each formed of two members—an inner one, a^2, fixed to the rock-shaft 22 and comprising two arms a' and a^2, curved rearward at their upper ends, and an outer member a^3, pivoted at its inner end between the two arms on a horizontal transverse axis a^4. Fixed to the outer member just above the upper ends of the arms a' and a^2 is a bracket a^5, provided with a forward projection a^6, and to the under side of this bracket adjacent to the arm is pivoted on a horizontal axis a^7 one end of a trip-block a^8, whose opposite end is jointed on an axis a^9 between the forward ends of two links a^{10}, extending on opposite sides of the upper member of the feeding-arm and jointed at their rear ends on an axis a^{11} to the upper ends of the arms a' and a^2. As a result of this construction the outer member of the feeding-arm is movable relatively to the inner member on the axis a^4, which movement is controlled and limited by the connecting-links a^{10} and trip-block a^8, so that although an obstruction may be offered to the outer ends of the feeding-arms and their motion may for the time being be arrested the lower members of these arms will be permitted to continue to move under the action of the transmitting power and the trip-lever will be allowed to continue its movement without interruption or injury to any of the driven parts. In order, however, that the members of the feeding-arms will be maintained in operative relations and held to their work under normal conditions, I provide a spiral spring a^{12}, which encircles a rod a^{13}, extending loosely through an opening in the extension a^6 of the bracket and having its lower end loosely mounted on an axis a^{14}, connected with the trip-block between its ends, the upper end of the spring bearing against an adjustable head a^{16}, threaded on the rod, and its lower end bearing on the upper side of the extension of the bracket and tending to hold the parts yieldingly in the position shown in Figs. 3 and 6, with the trip-block held up against the under side of the bracket extension and the outer member of the arm forming a continuation of the inner member. It is in this position of the parts that the feeding-arms normally act, the tension of the springs being such as to sustain the arms against a pressure sufficient to compress the material under treatment, but not sufficient to prevent the relative movements of the members of the arms in case undue resistance is offered, such as would result if the plunger-head remained in the baling-chamber in the path of the arms. In such a case the lower members of the arms carried by the rock-shaft would continue to move, pivoting on the axes a^4 with relation to the upper members of the arm, drawing the trip-blocks a^8 downward on their axes a^7 and compressing the springs a^{12}, as shown in Fig. 7.

The form and relation of the connections between the two members of the arm and their connecting axes are such that when the arms are in their normal positions, as shown in Figs. 3 and 6, the parts will be locked and held yieldingly locked by the springs, so that they will stand a considerable pressure without being tripped, and the relation of these connecting parts and the operating means is such that the lower members of the arms will be permitted to move with relation to the upper members in case an obstruction is encountered sufficient to allow the trip-lever to continue its operation and its rollers to successively engage and disengage the operating segment-gear D, so that when an obstruction is encountered by the feeding-arms the operative mechanism will continue to act uninterruptedly without injury to the parts.

The operation of the press is as follows: As the trip-lever is revolved by the rotation of the sweep in the usual manner the rollers will successively engage the end of the plunger-pitman and the plunger will be intermittently advanced into the baling-chamber and will act to compress the material therein, and as the rollers disengage the pitman at the end of each advancing movement the plunger will rebound and leave the chamber. The attendant in the meantime fills the hopper with hay, and after the trip-lever disengages the pitman it next engages the nose of the segment-gear D and turning said gear on its axis causes the chain 24, through the intermediate gearing, to be drawn forward, thereby rocking the shaft 22 downward and forcing the feeding-arms into the hopper on the hay therein, which latter is caused to descend by the action of the arms into the baling-chamber in the space vacated by the plunger. As the trip-lever disengages the segment-gear the spring 28, acting on the end of the rock-shaft, raises the feeding-arms and returns the connected parts to their former position. As the feeding-arms leave the chamber the next roller engages the pitman and the plunger is advanced into the chamber, pushing the charge which was forced downward by the feeding-arms before it, and these operations are repeated, the feeding-arms descending and forcing the hay into the baling-chamber as the plunger retracts and the latter advancing as the arms rise from the chamber. If the arms encounter an obstruction, such as would result if the plunger becomes jammed in the chamber in the path of the arm, the rock-shaft will continue to move under the pull of the chain and the inner members of the arms will rock on axes a^4, and drawing the links a^{10} rearward the ends of the trip-blocks a^8 will be pulled downward on axes a^7, overcoming the tension of springs a^{12} and their tendency to hold the trip-blocks locked against the extensions a^6 of the brackets. This movement of the inner members of the feeding-arms

with reference to the outer members will continue until the chain 24 has been pulled to its full extent forward, whereupon the trip-lever disengaging the segment-gear D the strain on the chain will be removed and the spring 28, acting on the rock-shaft, will raise the arms, whereupon springs a^{12} of the feeding-arms will act on the trip-blocks and pull them upward against the brackets, thus restoring the parts of the arms to their former operative positions. In this way there will be no interruption in the operation of the power mechanism of the press, notwithstanding the fact that the plunger may become jammed and obstruct the movements of the feeding-arms.

It will be observed that the form of the feeding-arms and the relations of the two members of the same are such that the inner members are yieldable in a direction opposite the feeding movement, which feeding movement is in a downward direction, as shown in Fig. 5.

Having thus described my invention, what I claim is—

1. In a baling-press the combination with a baling-chamber, of a feeding-arm mounted adjacent thereto, and comprising an inner member, and an outer member connected therewith and movable relatively thereto in a direction opposite the feeding movement of the arm, means for holding said members yieldingly against relative movement, and means acting on the inner member for imparting to the arm its feeding movement.

2. In a baling-press the combination with a baling-chamber, of a feeding-arm mounted adjacent thereto and movable downward into the chamber on a horizontal axis, said arm comprising a radial inner member and an outer member connected therewith and forming a radial continuation thereof, and movable relatively thereto in a direction opposite its feeding movement, means for rocking the arm on its axis, and a spring acting on said members and tending to hold them yieldingly against relative movement.

3. In a baling-press the combination with a baling-chamber, of a movable feeding-arm adapted to force the charge into the chamber, and comprising two members pivotally connected together, a link connection between the members independent of their pivotal connection, and a spring acting on the link connection and tending to hold the members yieldingly against relative movement.

4. In a baling-press the combination with a baling-chamber, of a feeding-arm adapted to force the charge into the chamber, and comprising two relatively movable members having a link connection between them, and means for holding said members yieldingly against relative movement.

5. In a baling-press the combination with a baling-chamber, of a rock-shaft mounted adjacent thereto, a feeding-arm carried by the rock-shaft and comprising an inner member fixed to the shaft, an outer member jointed to the inner member between its ends, a trip-block pivoted at one end to the outer member, a link connecting the opposite end of the trip-block with the outer end of the inner member, and a spring acting respectively on the block and outer member and tending to hold the parts against relative movement.

6. In a baling-press the combination with a baling-chamber, of a rock-shaft mounted adjacent thereto, a feeding-arm carried by the rock-shaft and comprising an inner member fixed to the rock-shaft, and an outer member pivoted at its inner end between the ends of the inner member, a forward extension on the outer member, a trip-block pivoted at one end beneath said extension adjacent to the member, a link jointed at its ends respectively to the opposite end of the trip-block and the outer end of the inner member, a rod extending loosely through the extension and jointed to the block between its ends, and a spiral spring encircling said rod above the extension and bearing at one end against the rod and at its opposite end against the extension, and tending to hold the block yieldingly up against the extension in line with the connecting-link.

7. In a baling-press the combination with a baling-chamber, of a feeding-arm mounted at its inner end adjacent to the front of the chamber and comprising an inner member and an outer relatively movable member, means for yieldingly holding said members against relative movement, said inner member being adapted when moved relatively to the outer member to extend into the chamber close to its front.

8. In a baling-press the combination with a baling-chamber, of a plurality of feeding-arms movable therein and having their outer ends yieldable independently of each other.

9. In a baling-press, the combination with a baling-chamber, of a rock-shaft mounted adjacent thereto, and a plurality of feeding-arms carried by the shaft and comprising inner fixed members and outer members connected therewith and movable independently of each other with respect to the inner members, and means for holding said outer members yieldingly against movement with respect to the inner members.

10. In a baling-press the combination with a baling-chamber, of a rock-shaft, a feeding-arm carried by the same, means for moving the shaft to cause the arm to descend into the chamber, a segment-sheave on the shaft, a chain connected with the sheave, and a spring fixed at one end to the frame of the press and at its opposite end to the chain.

11. In a baling-press, the combination with a baling-chamber, of a plunger movable therein to compress the charges, a pitman connected with the plunger, a trip-lever adapted to intermittently engage and disengage the pit-

man, a feeding mechanism adapted to feed the charge into the chamber, an oscillating gear in position to be actuated by the trip-lever, and operative connections, between said gear and the feeding mechanism for operating the latter.

12. In a baling-press the combination with a baling-chamber, of a rebounding plunger, a trip-lever for operating the plunger, a feeding mechanism adapted to feed the charge into the chamber, an oscillating segment-gear in position to be actuated by the trip-lever, an intermeshing gear operated by the segment-gear, a segment-sheave movable with the intermeshing gear, a chain connected with said sheave, and a segment-sheave connected with the feeding mechanism and also with said chain.

13. In a baling-press the combination with a baling-chamber, of a rock-shaft mounted adjacent thereto, a feeding-arm carried by the rock-shaft and having its outer end yieldingly sustained, a rebounding plunger, power mechanism for operating the same, oscillating gearing operated by the power mechanism, and suitable connections between said gearing and the rock-shaft.

14. In a baling-press the combination with a baling-chamber of a rebounding plunger, a pitman connected with the plunger, a trip-lever adapted to engage and disengage the pitman, a rock-shaft mounted adjacent to the baling-chamber, a feeding-arm mounted thereon, an oscillating segment-gear in the path of the trip-lever, an intermeshing gear adapted to be actuated by the oscillating gear, a segment-sheave connected with the intermeshing gear, a segment-sheave on the rock-shaft, a chain connecting said sheaves, and means for restoring the parts to their original positions after being operated by the trip-lever.

In testimony whereof I hereunto set my hand, this 26th day of September, 1903, in the presence of two attesting witnesses.

RALIEGH P. WHITE.

Witnesses:

S. B. STOKELY,

W. D. FRACE.