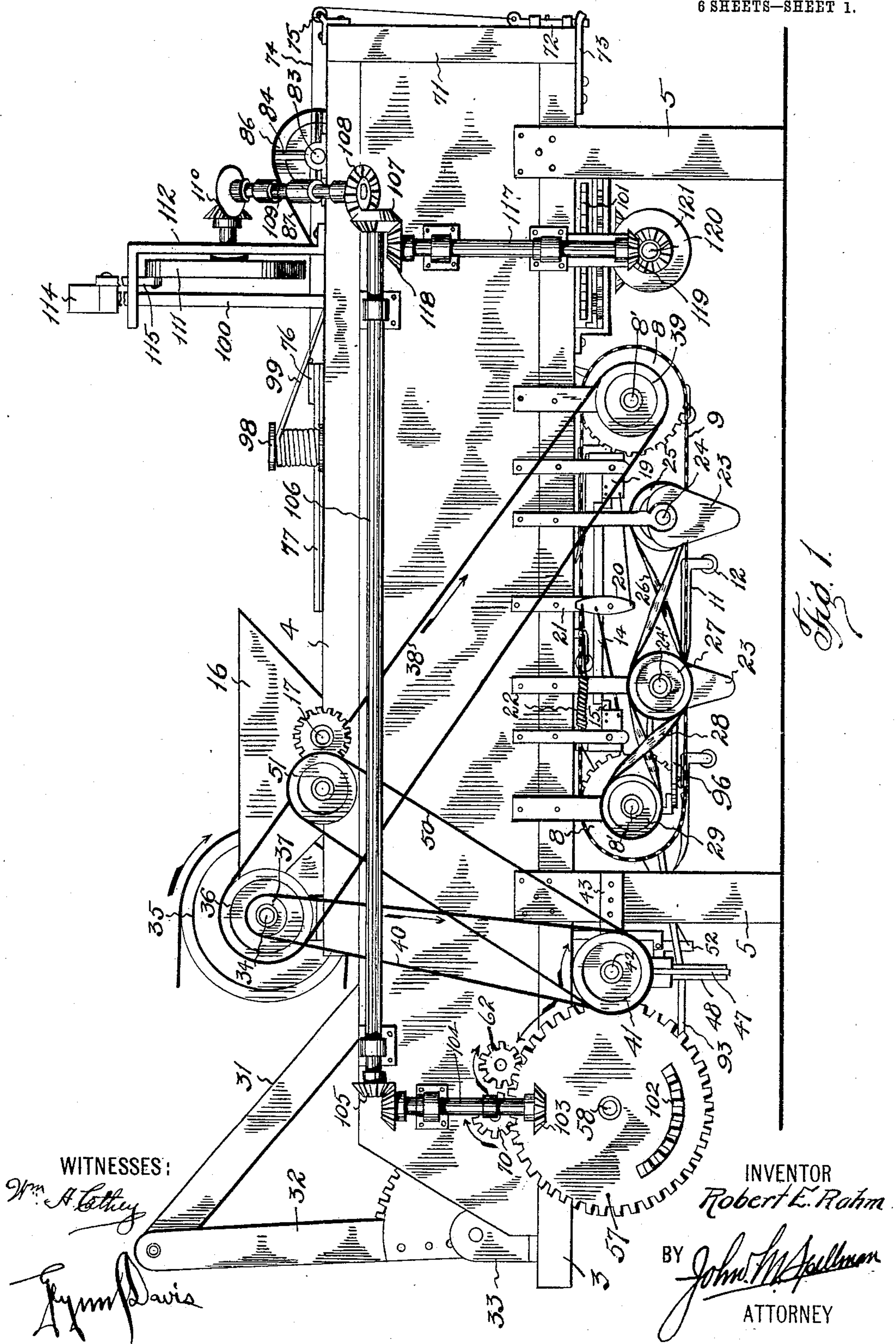


R. E. RAHM.  
 AUTOMATIC BALING PRESS.  
 APPLICATION FILED MAR. 16, 1908.

930,083.

Patented Aug. 3, 1909.

6 SHEETS—SHEET 1.



WITNESSES:

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Lynn Davis

INVENTOR

Robert E. Rahm

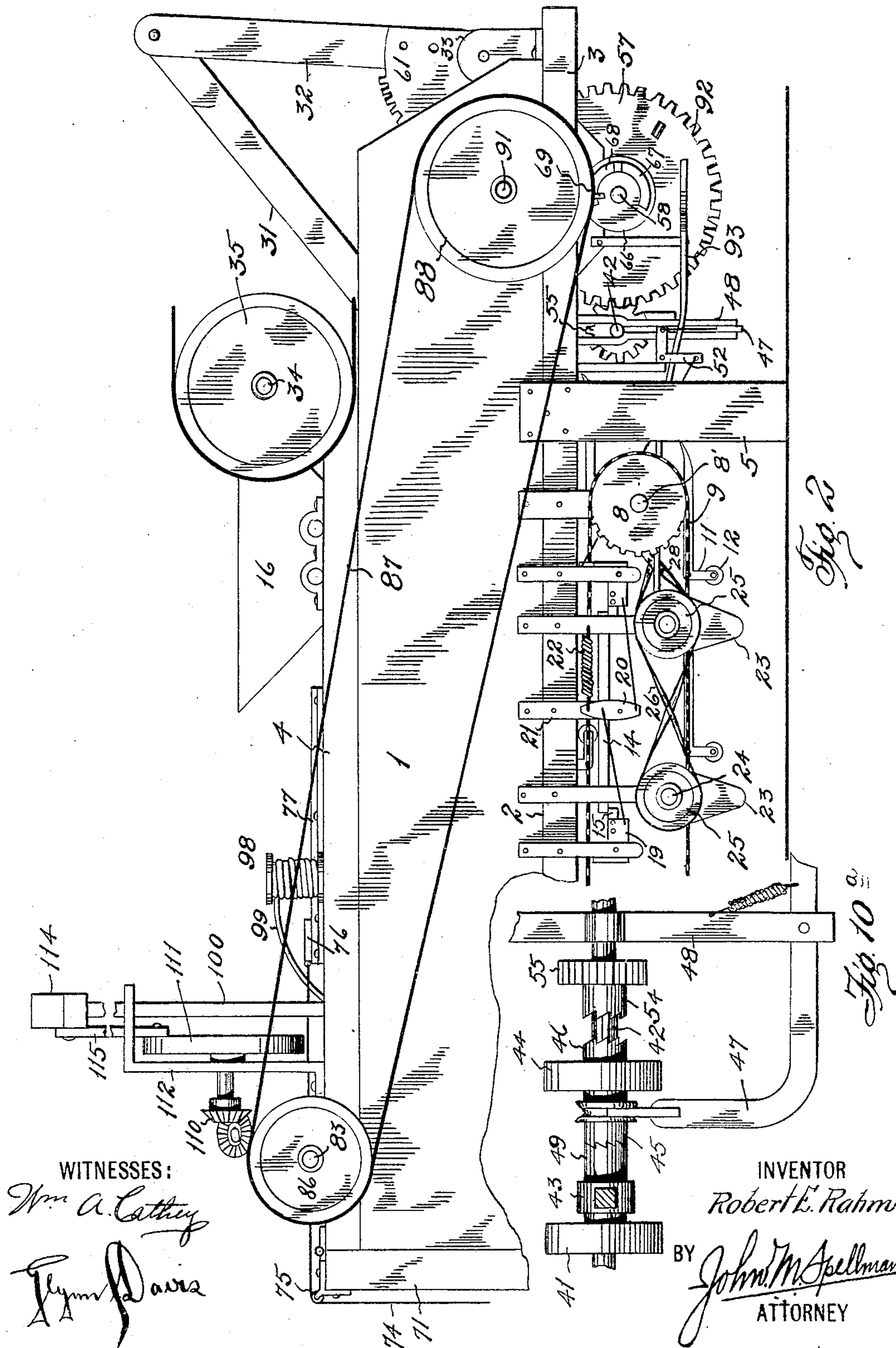
BY

John M. Spillman  
 ATTORNEY

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Patented Aug. 3, 1909.  
6 SHEETS—SHEET 2.



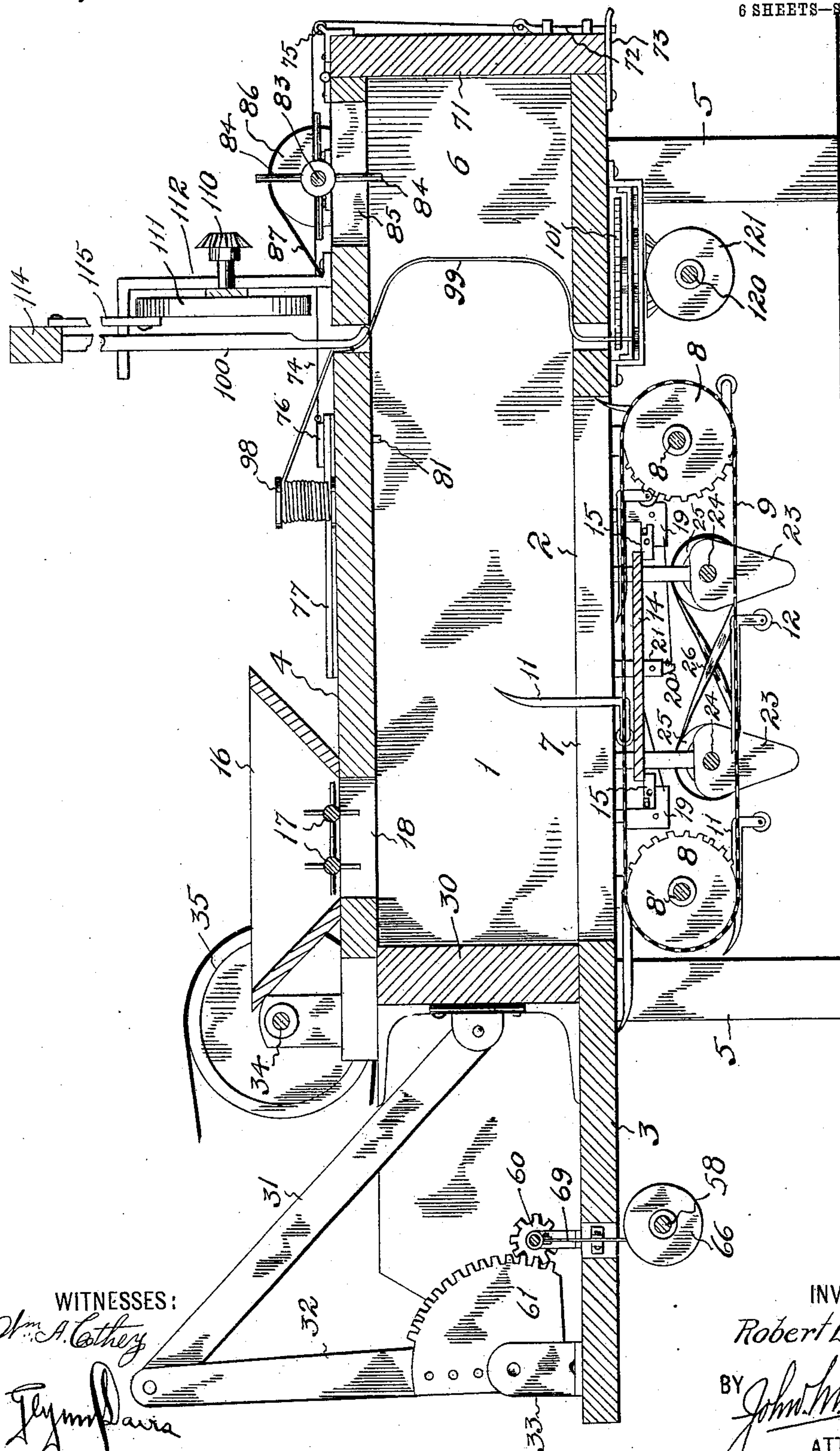


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6 SHEETS—SHEET 3.



WITNESSES:  
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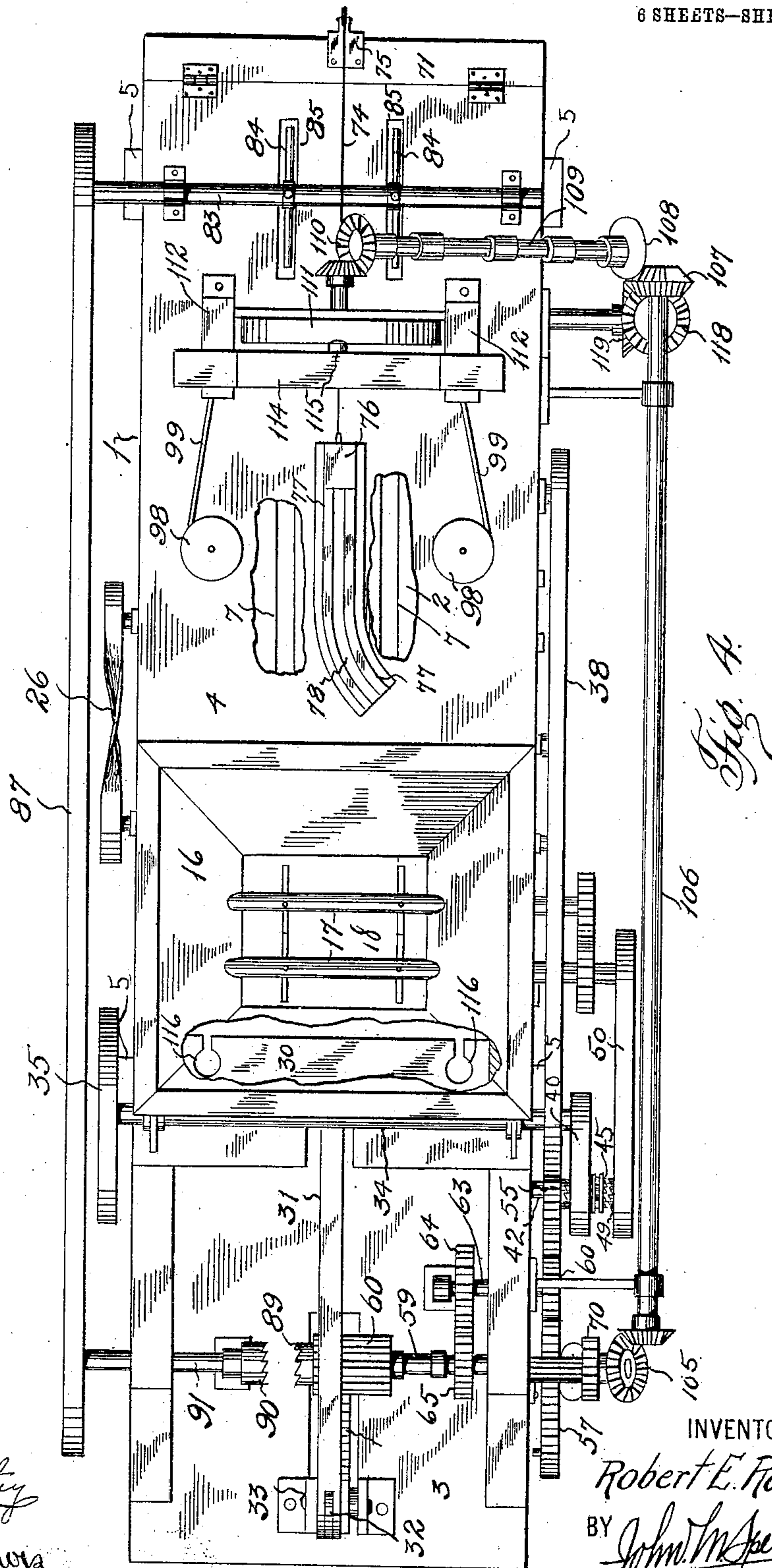
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930,083.

Patented Aug. 3, 1909.

6 SHEETS—SHEET 4.



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R. E. RAHM  
AUTOMATIC BALING PRESS.  
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6 SHEETS—SHEET 5.

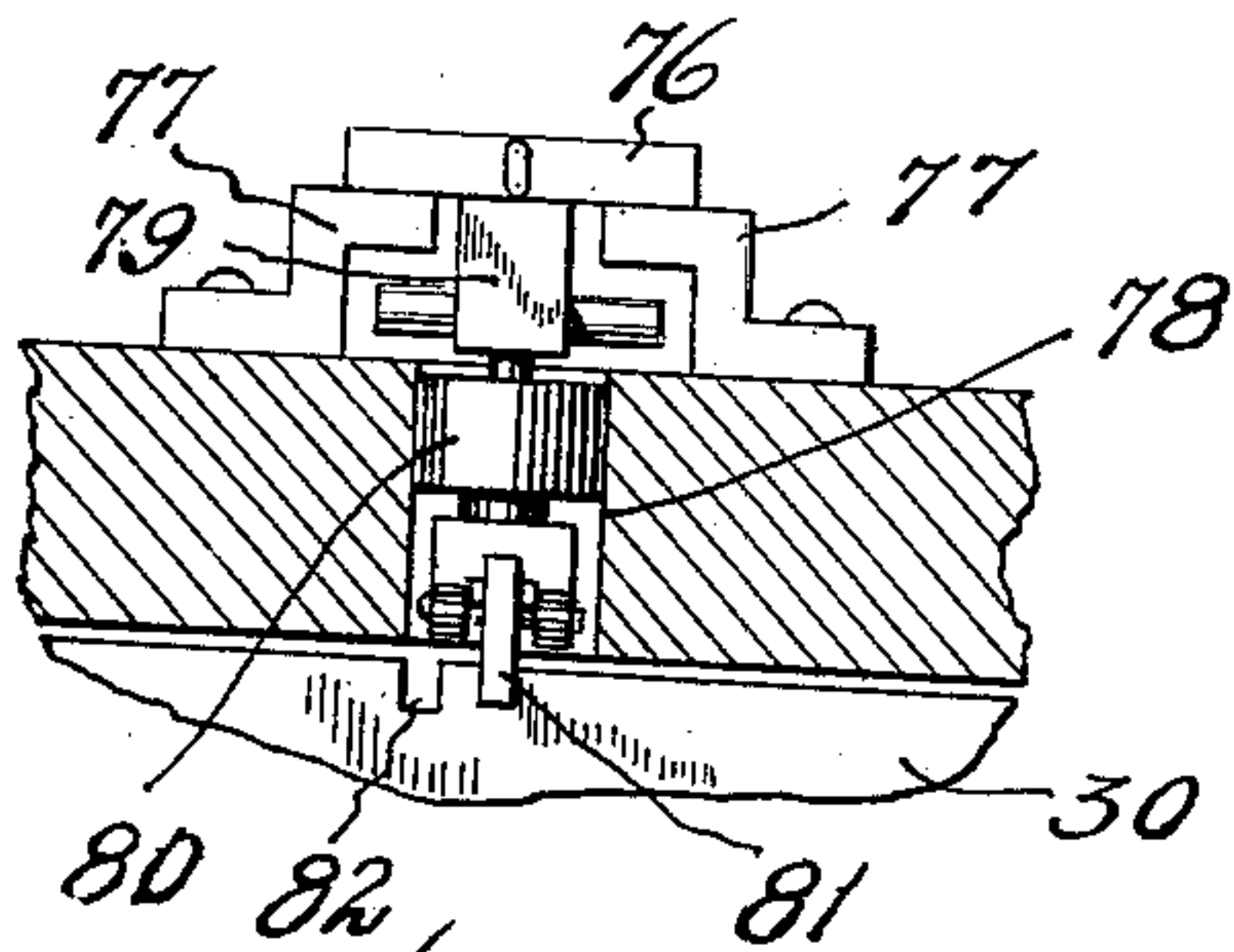


Fig. 5.

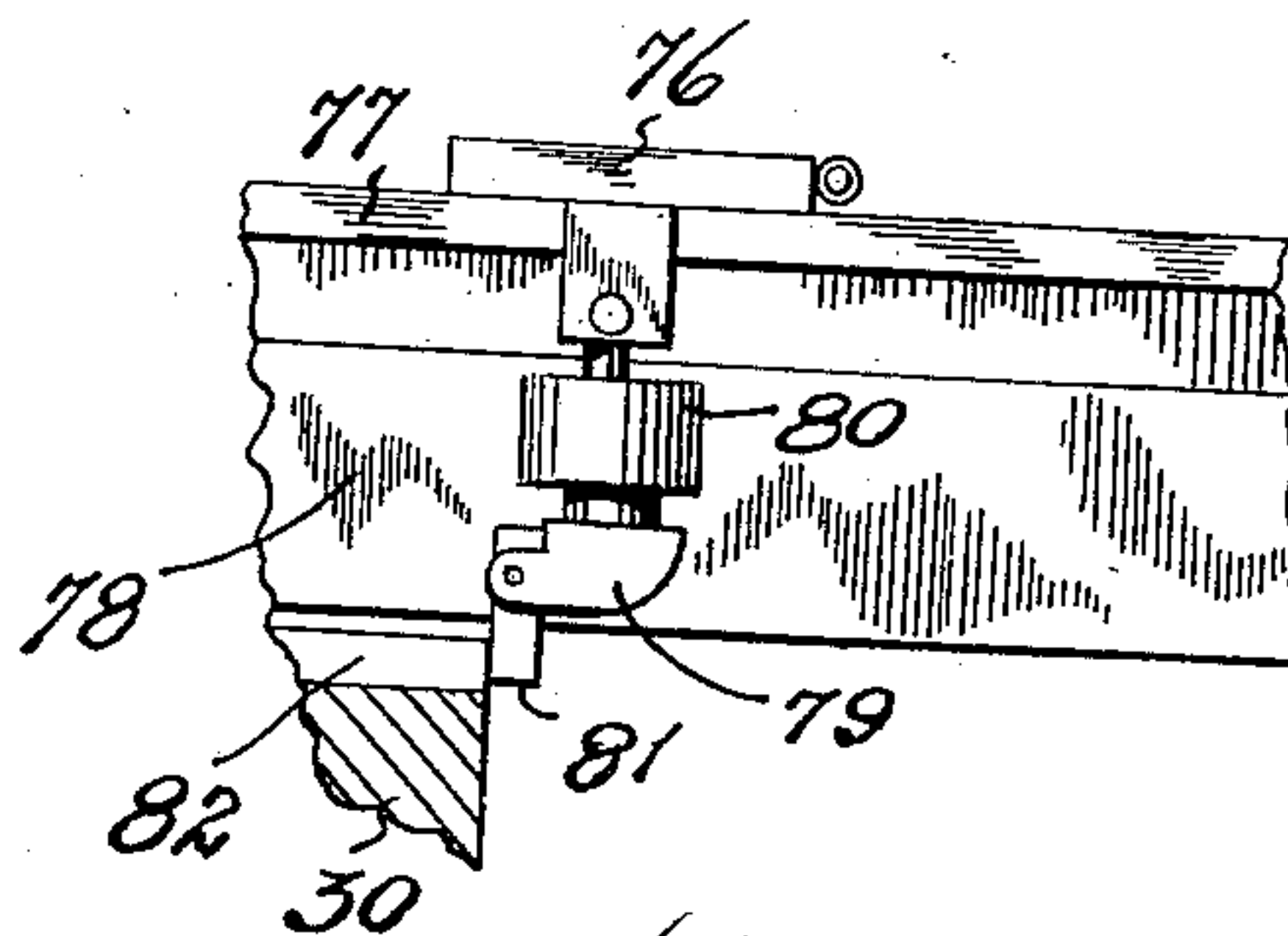


Fig. 6.

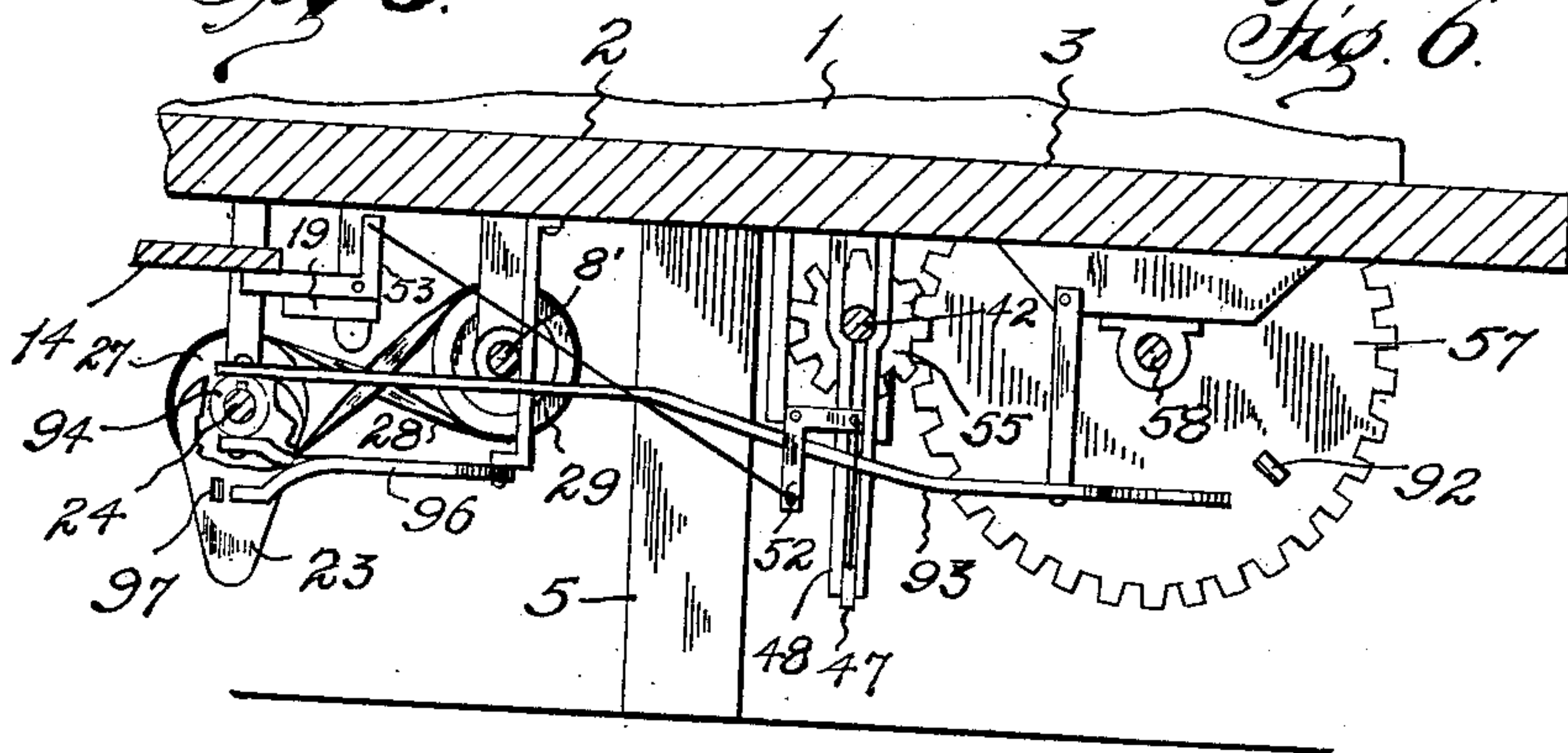


Fig. 7.

Fig. 8.

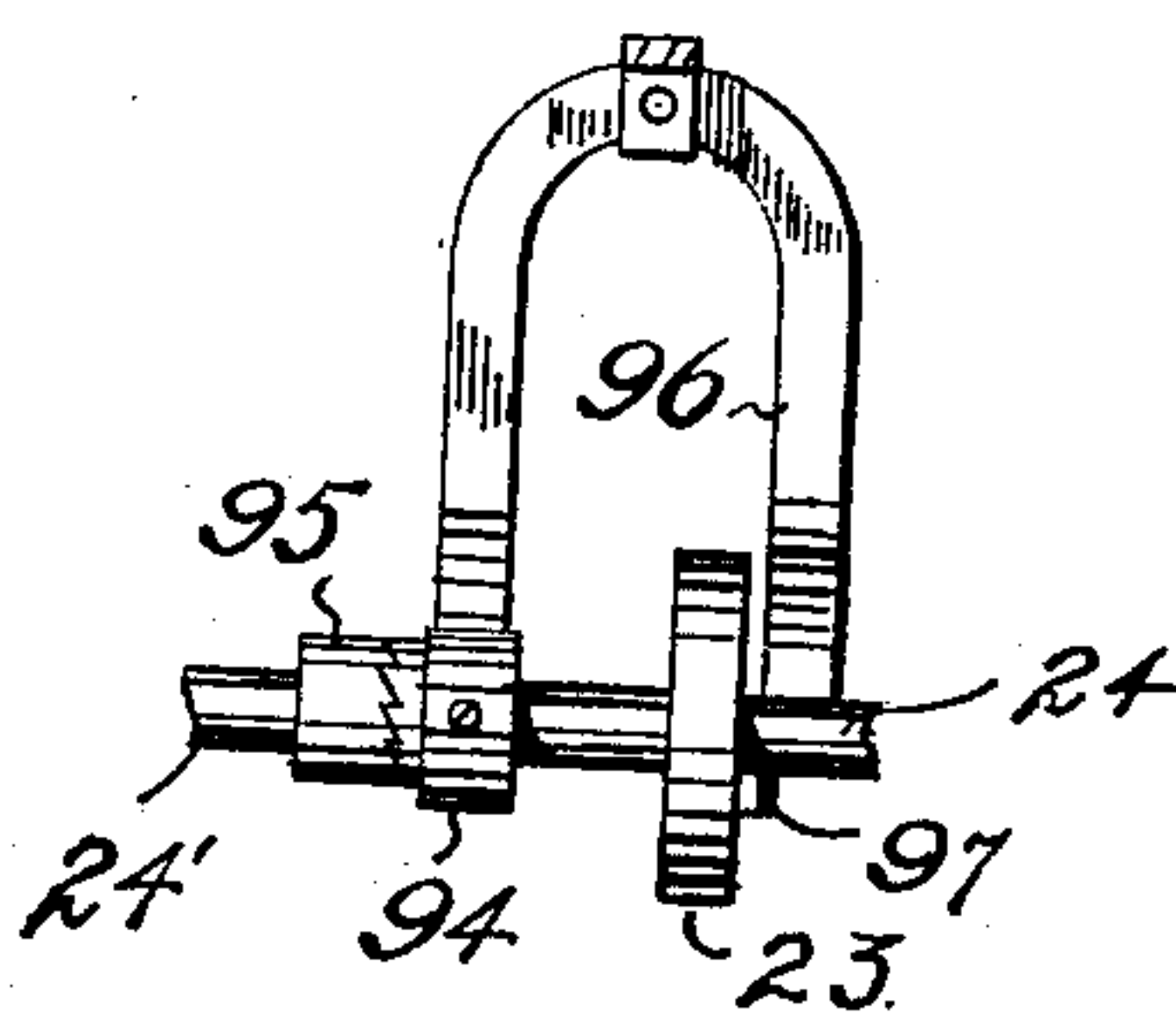
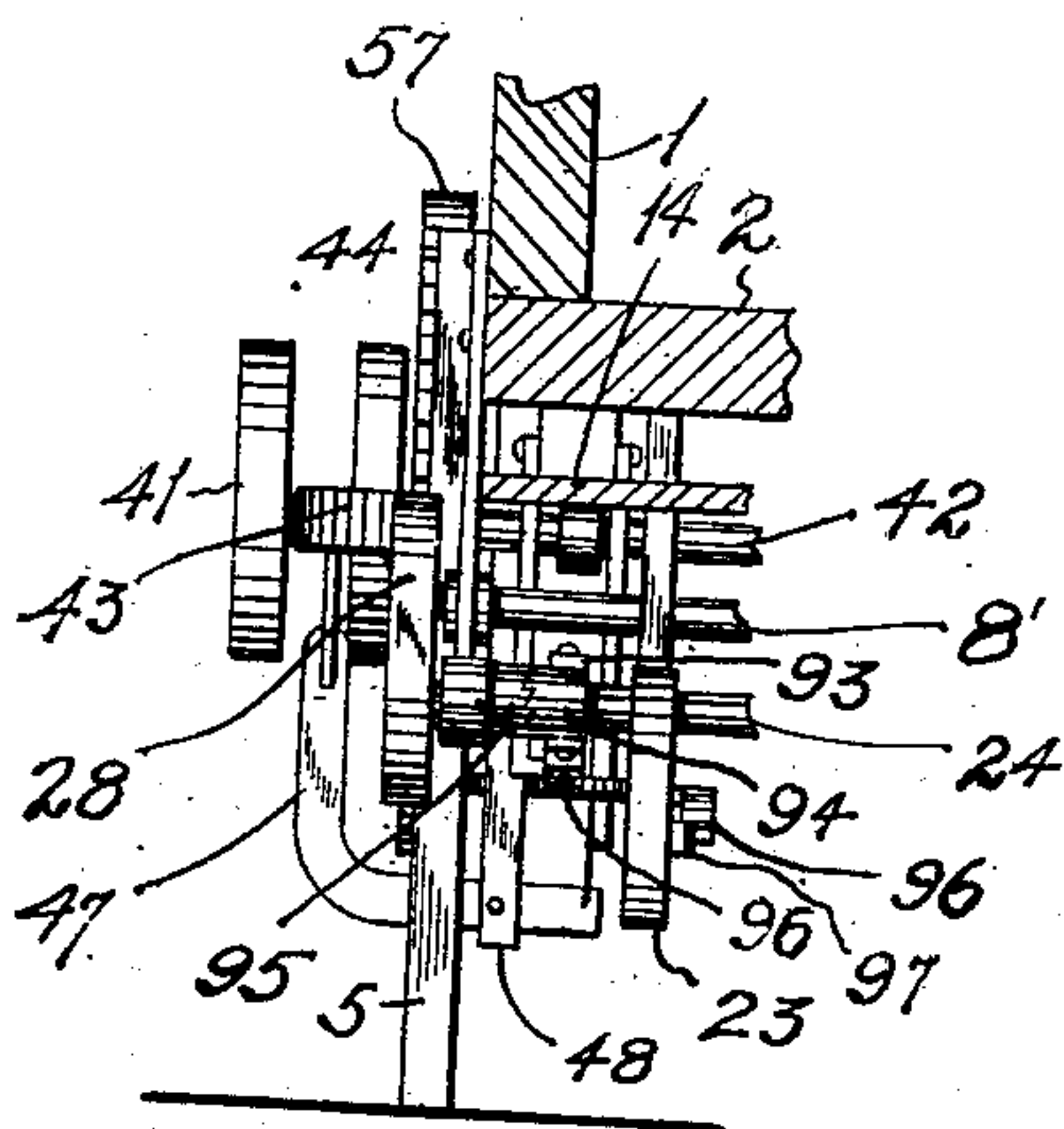


Fig. 9.

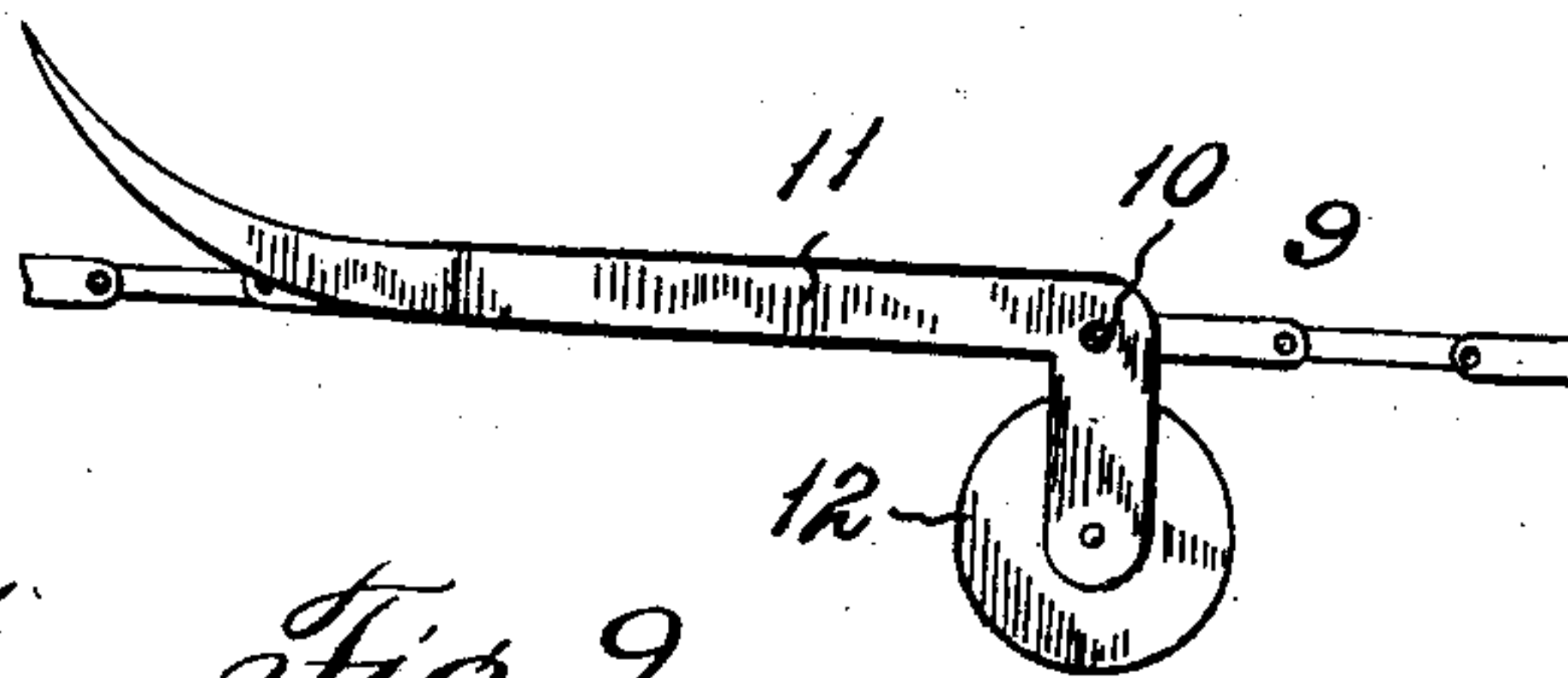


Fig. 10.

WITNESSES:

*Glynn Davis*  
*Lelan Lewis*

INVENTOR

*Robert E. Rahm.*

BY

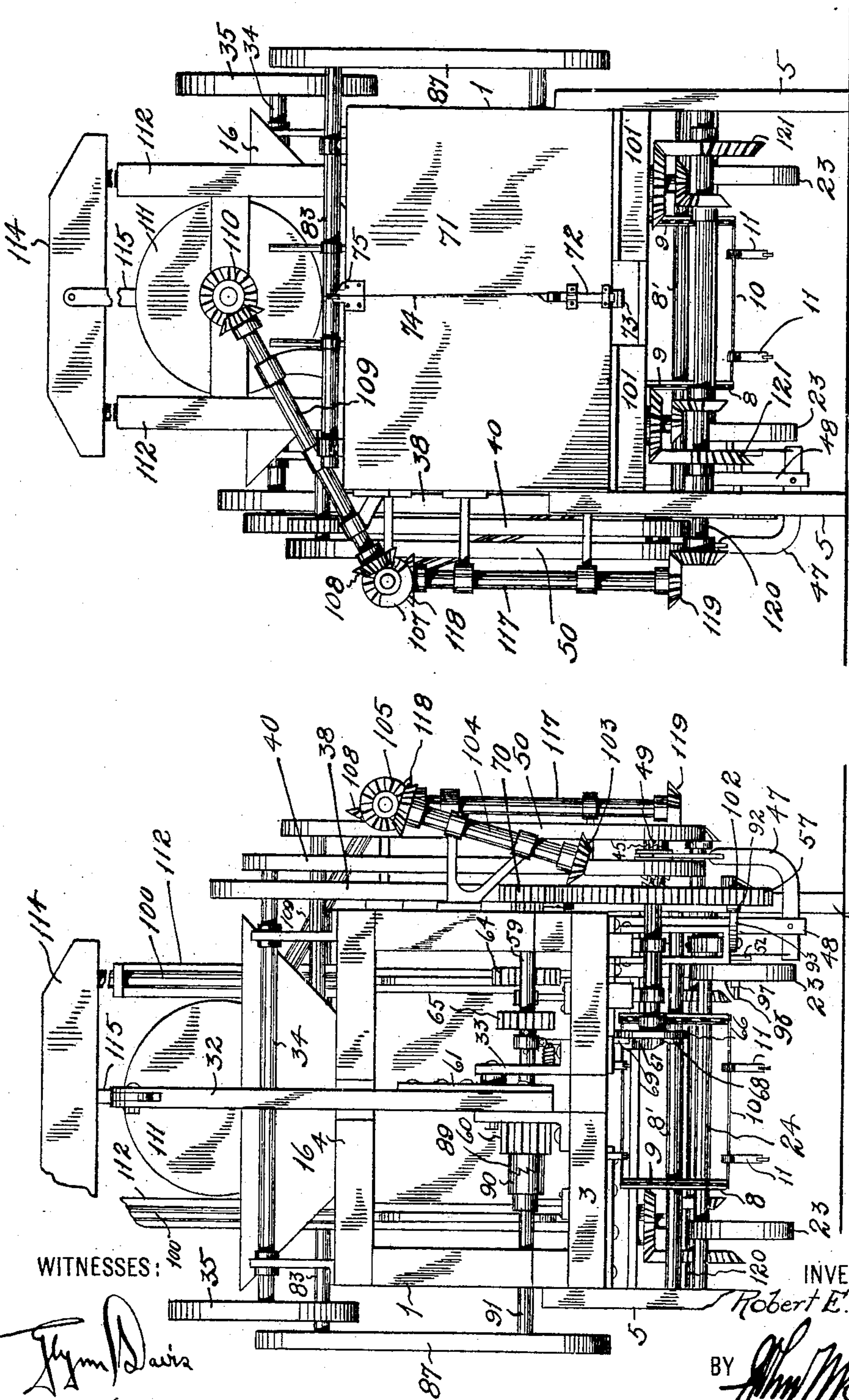
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R. E. RAHM.  
 AUTOMATIC BALING PRESS.  
 APPLICATION FILED MAR. 16, 1908.

930,083.

Patented Aug. 3, 1909.

6 SHEETS—SHEET 6.



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# UNITED STATES PATENT OFFICE.

ROBERT E. RAHM, OF DALLAS, TEXAS.

## AUTOMATIC BALING-PRESS.

No. 930,083.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed March 16, 1908. Serial No. 421,420.

*To all whom it may concern:*

Be it known that I, ROBERT E. RAHM, citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Automatic Baling-Presses, of which the following is a specification.

My invention relates to new and useful improvements in hay presses.

10 The object of the invention is to provide a press having a plurality of devices for packing the hay into the baling-chamber as it is fed into the press and means whereby the packing devices move out of the path of the press-head during the travel of the same.

15 A further feature lies in automatic means for operating and controlling the movement of the press-head in conjunction with the packing devices.

20 Another point of novelty resides in means for opening the pressing or baling chamber and ejecting the bale; also means for wiring and tying the bale.

25 Finally the object of the invention is to provide a device of the character described that will be strong, durable, efficient and comparatively simple and inexpensive to construct; also one in which the several parts will not be liable to get out of working order.

30 With the above and other objects in view, the invention has relation to certain novel features, an example of which is described in the specification and illustrated in the accompanying drawings, wherein:

35 Figure 1 is a side elevation of the press, Fig. 2 is an elevation of the opposite side, a portion being broken away, Fig. 3 is a longitudinal sectional view, Fig. 4 is a plan view, broken away to show the press-head and the slots, Fig. 5 is a partial transverse sectional view through the top of the press box, showing the press chamber opening means in elevation and looking from the baling chamber, 40 Fig. 6 is a side elevation of the same parts, the press-head being shown in vertical section, Fig. 7 is an end elevation of a portion of the controlling means, Fig. 8 is a side elevation of the same, Fig. 9 is a side elevation of one of the fingers and a portion of the chain, 45 Fig. 10 is a detailed view of the mechanism employed for raising the plate which holds the feeding fingers in upright position, Fig. 10<sup>a</sup> is a detail of the clutch mechanism. 50 Fig. 11 is a rear elevation, and Fig. 12 is a front elevation.

In the drawings, the numeral 1 designates an elongated press-box having a bottom 2 provided with an extended platform 3, and a top 4. The box is supported on legs 5 and otherwise suitably constructed to perform 60 the operation of baling. The forward end of the box forms a baling chamber 6, from which two longitudinal slots 7, extend rearward in the bottom 2. Sprocket wheels 8 are fixed on shaft 8' supported transversely 65 of and beneath the box at each end of the slots. The wheels at each end of each slot are connected by endless chains 9, one extending along the outside of each slot, substantially the entire length thereof. The 70 chains 9 are connected transversely, and at regular intervals, by rods 10 on which packing fingers 11, are pivoted. These fingers are positioned and adapted to swing up into 75 the box through the slots 7, and as shown in Fig. 9, are substantially L-shaped, the forward end of the long leg being pointed and curved upward and the short leg carrying a roller 12, said fingers being pivoted at the intersection 80 of the legs. The rollers 12 are of sufficient weight to maintain the long legs of the fingers in a substantially horizontal position. The chains travel toward the baling chamber carrying the fingers beneath the slots 7, the 85 same being swung up into the box by the engagement of the rollers with a plate 14 supported on latches 15, just under the upper lengths of the chains. The press is fed 90 from a hopper 16 having feeding rolls 17, through an opening 18 over the rear ends of the slots, the material being carried forward by the fingers and packed in the baling chamber. As the material accumulates in 95 the box, the resistance offered to the fingers is gradually increased until the fingers are forced back and down, the rollers depressing the plate 14 until the latter drops and the fingers are free to assume a horizontal position, being thus withdrawn from the box. 100 The latches 15 which support the plate are pivoted to swing upward only and are mounted on bell-crank levers 19 suitably supported from the bottom 2. The adjacent ends of these levers are connected with the opposite 105 ends of a lever 20, as shown in Fig. 1, pivoted centrally on a support 21 and held in position by a coiled spring 22 suitably supported on the side of the box. Consequently when the levers 19 are swung down, 110 this connection causes them to swing away from each other simultaneously, and thus



pressure exerted on any part of the plate will cause an equal movement by all the levers 19. When the plate drops off the latches, the levers are returned to their normal position by the spring 22 and connections. As the plate drops it falls upon cams 23 fixed on transverse shafts 24 supported from the box and normally having their projecting portions extending downward. After the bale has been formed and it is desired to again raise the plate to pack the next bale, the cams are swung as follows: Pulleys 25, connected to the shafts, are connected by a crossed belt 26, causing the cams to move toward each other as they are swung upward by a pulley 27 connected to a shaft 24' and driven by a belt 28 running over a pulley 29 mounted on the rear shaft 8' and driven by the chain mechanism. However the swinging of the cams is controlled by a clutch mounted on the rear shaft 24 and a shaft 24' which normally holds the cams against movement and when set by proper means, permits the transmission of motion to the cams. This clutch and means will be hereinafter described.

It will be noted that after the plate has dropped and during the baling operation the cams are at rest. When the cams are set in motion, they swing toward each other and up, engaging the plate 14 and raising it. The plate in passing upward encounters the latches 15 which are swung upward until they drop beneath the same and the plate comes to rest thereon when the cams pass over their centers. The clutch mechanism is arranged to permit one revolution of the cams only.

The bale compressing means will be next described. A suitable press-head 30 is mounted to travel in the box and is normally held in rear of the slots 7 and the opening 18. The head, at its rear central portion, has pivoted connection with a link 31 having pivoted connection with the upper end of an arm 32, normally held in an upright position and pivotally supported between ears 33 mounted on the platform 3. It is obvious that when the arm is swung forward and down, the head by means of the link will be moved forward in the box to the baling-chamber, all the material lying in the box being carried forward into the baling-chamber, and together with that already packed by the fingers, densely compressed. On the other hand when the arm is swung up and rearward, the head will be retracted and returned to its normal position.

It is apparent that means for operating the various parts at the proper time must be provided. In carrying out the transmission of motion, a driving shaft 34 is suitably mounted on the top 4 just in rear of the hopper 16 and carries a driving pulley 35 to which motion is imparted by a belt or other suitable

means. On the opposite end of the shaft, pulleys 36 and 37 of smaller diameters, are mounted, one outside of the other. The driving pulley 35 is driven in the direction of the arrow, which drives the chains 9 forward by means of a belt 38, passing over the pulley 36 and about a pulley 39 mounted on the forward shaft 8'.

Motion is imparted from the pulley 37 by a belt 40 to a pulley 44 having clutch-hubs 45 and 46 and loosely mounted on a transmission-shaft 42 supported in a bearing 43. On the outer end of the shaft 42 a pulley 41 is secured to a clutch-sleeve 49 mounted in the bearing 43 and transmits motion by means of a belt 50, to a pulley 51 mounted on the end of one of the feeding-rolls 17 which are suitably geared to perform their operation. The clutch-hub 45 is normally in engagement with the clutch-sleeve 49 so as to transmit motion thereto, while a spring-held lever 47 pivotally supported in a bracket 48 has engagement with the clutch-hub 45. It will be noted by observing Fig. 10 that the bracket 48 also forms a bearing for the inner end of the shaft 42. The lever 47 has connection, as shown in Figs. 7 and 8, with a bell-crank lever 52 suitably supported beneath the bottom and having connection with a reversed bell-crank lever 53 likewise supported and having engagement with the plate 14. Therefore when the plate 14 drops, as hereinbefore described, the bell-crank lever 53 is swung downward, swinging the rear end of the lever 52 downward which swings the lever 47 downward causing its upper end which has engagement with the clutch-sleeve 45, as shown in Fig. 10, to swing inward and thus slide the pulley 44 on the shaft 42 until, the clutch-sleeve 46 engages with a clutch-hub 54 carried by a pinion 55 loosely mounted on the shaft.

The pinion 55, as shown in Figs. 2 and 4 engages with a large gear 57. The gear 57 is fixed on the end of a shaft 58 suitably supported from the under side of the platform 3, as shown in Figs. 2, 7, and 8. A transverse shaft 59 is supported on the platform 3 so as to be capable of longitudinal movement, and carries on its inner end, a broadface pinion 60. This pinion meshes with a segmental gear-plate 61 secured to the side of the arm 32 as best shown in Fig. 3.

Motion being transmitted to the large gear 57 in the direction shown by the various arrows, the said gear is revolved to the left with relation to Fig. 1. Motion is taken from the said gear by a pinion 62 which is revolved to the right, as shown in Fig. 1, and is mounted on the end of a suitably supported shaft 63, as shown in Fig. 4. This shaft carries a pinion 64 meshing with a pinion 65 mounted on the shaft 59 thus causing the same and the pinion 60 to revolve to the right with relation to Fig. 2, which causes



the segmental plate 61 to be moved downward with the arm 32, thus moving the head 30 forward into the box and baling-chamber. It is thus apparent that just as soon as the plate 14 drops, the mechanism just described moves the clutch-hub 45 out of engagement with the clutch-sleeve 49 thus interrupting the transmission of motion to the pulley 51 and stopping the feeding mechanism; at the same time setting into operation the necessary parts to impart to the press-head 30, its forward stroke. It is necessary to momentarily hold the head at the end of its forward stroke so that the bale will be held in form during the tying operation which will be hereinafter described.

In carrying out the above and for returning the head, on the end of the shaft 58 a disk 66 is keyed and provided with a cam having high and low portions 67 and 68 one merging into the other as shown in Figs. 2 and 11. A spring-held lever 69 pivoted in the platform 3 projects into the path of the cam and has connection at its upper end with the longitudinally movable shaft 59. It is to be understood that the movements of all parts are controlled by the large gear 57, a complete revolution of this wheel occurring while the head 30 is going through its forward movement, the rest period and its return movement. Consequently when the gear has revolved a certain portion of its revolution, the disk 66 being fixed on the same shaft, will revolve accordingly.

At the beginning of the downward movement, the high portion 67 of the cam rides against the end of the lever 69 swinging the same against the tension of its spring so that the shaft 59 is slid outward to occupy the position shown in Fig. 4, which throws the gear 65 into mesh with the pinion 64. As the large gear 54 continues to revolve, the head 30 is moved forward so that simultaneously with its arrival at the compression chamber, the high portion 67 of the cam rides from beneath the lever and the low portion 68 of the cam engages the same with the result that the shaft 59 is moved inward throwing the pinion 65 out of mesh with the pinion 64 so that the transmission of motion to the shaft is interrupted and the rest period begun. The parts occupy these positions and the rest period is continued while the low portion of the cam continues to ride past the lever 69.

As before mentioned the material in the box is carried forward by the forward movement of the head 30 and tied during the rest period. When the low portion 68 of the cam passes from the lever 69, the shaft 59 being under spring tension, is pulled over so that a pinion 70 carried on the outer end of said shaft, is thrown into mesh with the large gear 57 as shown in Figs. 1 and 11, which causes the broadface pinion 60 to revolve to the right with relation to Fig. 3

which acts to swing the plate 61 and arm 32 upward, which withdraws or returns the head 30 to its normal position.

The end of the baling-chamber is formed by a door 71 suitably hinged to the top 4 and fastened by a vertical slide-bolt 72 engaging in a latch-plate 73 secured to the bottom of the baling-chamber. A flexible connection 74 passes up over a guide-pulley 75 suitably mounted on the upper corner of the door, to the forward end of a slide-plate 76 as shown in Figs. 4, 5, and 6. This plate rests on guide-rails 77 curved at their rear end and conforming to a slot 78 in the top 4 as best shown in Figs. 4 and 5. A shoe 79 projects into the slot from the plate 76 carrying a roller 80 bearing against the side-walls thereof and terminating substantially flush with the underside of the top 4, at its lower end. A dog 81 is pivoted in the lower end of the shoe so as to be engaged by the head 30 and swing upward into the shoe as the head moves forward and past the same, but to remain rigid and establish a connection between the head and the shoe when engaged by the former during its return movement. Therefore as the head 30 is returned to its normal position it engages the dog 81 and moves the plate 76 rearward, through the agency of the shoe, on the rails 77. As the said plate is moved the bolt 72 is withdrawn from the latch-plate 73 and the door 71 swung outward and upward until it reaches a substantially horizontal position. As before stated the slot 78 curves to one side at its rear end. The roller 80 causes the shoe to readily follow the slot and thus the parts as well as the dog 81 are moved laterally at the end of the slot, and the rearward movement of the plate 76. The head 30 is provided in its upper side, with a slot 82 positioned to register with the dog when the shoe reaches the rear end of the slot, thus breaking the connection between the head of the shoe and permitting the head to continue on its rearward movement.

To eject the bale from the chamber a transverse shaft 83 is mounted on the top of the chamber and provided with fingers 84 to pass through slots 85 as shown in Figs. 3 and 4 and engage the bale as the shaft revolves. For revolving the shaft 83 to the left with relation to Figs. 3 and 4, a pulley 86 is mounted on the projecting end of the shaft and driven by a belt 87 extending from a pulley 88 as shown in Fig. 2.

Referring to Fig. 4 when the pinion 60 is moved inward to begin the return movement of the press-head, a clutch 89 carried thereby, is thrown into engagement with a clutch 90 carried on the end of a shaft 91 suitably supported and having mounted on its outer end the pulley 88. It is apparent that as the press-head starts on its rearward movement, the door opening and raising mechanism,



and the ejecting device are set into operation, and the bale as it is ejected bears against the door assisting in the raising of the same, and thus taking some of the strain off of the flexible connection 74. Thus when the shoe 79 reaches the rear end of the slot 78, the bale will be practically ejected so that the door is free to swing down and lock, and return the plate 76 and other parts to their normal position.

When the head 30 reaches the end of its return stroke or normal position, the large gear 57 has completed a full revolution and is stopped as will be hereinafter described. However, just prior to this, a cam 92 mounted on the inside of the gear 57 engages the end of a lever 93 suitably pivoted and having engagement at its opposite end with a slidable clutch-sleeve 94 mounted on the adjacent shaft 24 carrying the rearward plate-raising cams 23. The lever 93 is arranged so that when it is swung by the cam 92 the clutch-sleeve 94 is moved into engagement with a clutch-sleeve 95 fixed on the shaft 24' so that motion which is being imparted to the pulley 27, will be transmitted to the shafts 24 and swing the cams 23 upward. As the cams 23 swing upward they raise the plate 14 until it trips past the latches 15 as hereinbefore described. It will be apparent that as the plate is raised the bell-crank levers 52 and 53 will be swung, thus permitting the lever 47 as shown in Figs. 8 and 10, to slide the pulley 44 so that the clutch-hub 46 is withdrawn from the clutch-hub 54 and the clutch-hub 55 thrown into engagement with the clutch-sleeve 49; further rotation of the large gear 57 being prohibited and motion again transmitted to the pulley 41 and the feeding-rolls 17. Of course, just as soon as the plate 14 is raised the fingers 11 are again thrown into position and the forming of the next bale begun. When the large gear 57 is stopped the cams 23 are still revolving as the clutch-sleeve 94 is still in engagement with the clutch-sleeve 95, but for limiting the movement of the cams to one revolution, a yoke-shaped lever 96 is attached to the underside of the clutch-sleeve 94 and pivotally supported from the bottom of the press in a suitable manner. The free end of the lever 96 terminates adjacent one of the cams 23 below the center of the same so as to be engaged by a lug 97 just prior to the end of the revolution of said cam. Thus as the cam completes its revolution the lug engages the lever 96 sliding the sleeve 94 out of engagement with the sleeve 95, motion thus being interrupted and the cams swinging to their lowermost position. All parts having thus been restored to their normal positions the forming of another bale is begun, the completion of which is carried out in the manner described. It is to be understood that the operation of the press is en-

tirely automatic so that no incidental operation or step is dependent upon manual operation.

As before stated a suitable tying mechanism is provided in connection with the press. This consists of a pair of reels 98 mounted on the top 4 on each side of the rails 77 as shown in Fig. 4. The wire 99 from these reels is carried through the ends of needles 100 adapted to pass down through the top and bottom of the press-box as will be described. The ends of the wires are held in a suitable rotatable knotter 101, but each wire is free to slide through the ends of its respective needle so that as the material is fed into the baling-chamber, the wires are carried forward so that they are looped around the bale on three sides as the same is formed.

The bale is tied as hereinbefore stated during the rest period. By the time the rest period is reached or when the head 30 has arrived at the end of its forward stroke, the large gear 57 will have revolved sufficiently to bring a segment of gear-teeth 102 arranged on its side, into mesh with the beveled pinion 103 of a vertical shaft 104 which is secured to the outside of the press-box and has connection by a miter gearing 105 with a longitudinal shaft 106 extending forward along the upper side of the press-box. On the end of the shaft 106 a double faced mutilated pinion 107 is secured. One side of the pinion meshes with a gear 108 secured to a shaft 109 transmitting motion by beveled gearing 110 to a disk 111 mounted in a suitable bracket 112. This bracket forms a guide for the needles 100 which are connected by a cross-head 114, the latter being connected with and moved vertically by a link 115 connected to the disk 111.

When the disk is revolved the needles are carried down and up to loop the wire in rear of the bale, the needles passing through vertical openings 116 in the press head 30 as shown in Fig. 4. Motion is transmitted from the other side of the pinion 107 to a vertical shaft 117 mounted on the side of the baling-chamber, by a beveled pinion 118. This shaft transmits motion by a miter-gearing 119 to a transverse shaft 120 running beneath the baling-chamber as shown in Fig. 12. The shaft 120 transmits motion by suitable gearing 121 to the tying device or knotter 101. Thus by reason of the mutilated beveled-pinion 107 the needle operating means and the tying device are set into operation at the proper time. It being observed that the segment 102 is of such length as to transmit motion to the pinion 103 only during the rest period and that when the low portion 68 of the cam rides off of the lever 69, the segment 102 is carried out of engagement with the pinion 103 and the return stroke of the press-head begun, the needles having been returned to their normal position and



the wires 99 arranged for the next bale. It will thus be apparent that the tying operation is completed before any of the subsequent operations are instituted.

I have not entered into a detailed description of the tying device as the same forms no particular part of the present invention, except that to produce an operative machine a suitable rotary tying device must be provided. However the exact construction of the same may vary as will be apparent.

What I claim, is:

1. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in said box, of means for moving said press-head, means operating through the slots of the box for packing the material therein subsequent to the forward movement of the press-head, and means for controlling the movement of the press-head set to operate by said packing means.

2. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in said box, of means for moving said press-head to form the bale, means operating through the slots of the box for packing material therein subsequent to the forward movement of the press-head, means for operating the feeding means, and means set to operate by the packing means for alternately setting the last named means and the press-head operating means into operation.

3. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in said box, of means for moving said press-head, means operating through the slots of the box for packing the material therein subsequent to the forward movement of the press-head, means for controlling the movement of the press-head set to operate said packing means, and means for ejecting the bale from the box.

4. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in the box, of means for moving said press-head, means operating through the slots of the box for packing the material therein subsequent to the forward movement of the press-head, means for imparting motion to the feeding-means normally in operation, means for controlling the forward and rearward movement of the

press-head and its operating means, and means set to operate by the packing means for throwing said controlling means into operation and the means for imparting motion to the feeding means out of operation.

5. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in the box, of means for moving said press-head, means operating through the slots of the box for packing the material therein subsequent to the forward movement of the press-head, means for imparting motion to the feeding means normally in operation, means for controlling the forward and rearward movement of the press-head and its operating means, means set to operate by the packing means for throwing said controlling means into operation and the means for imparting motion to the feeding means out of operation, and means acting upon the last named means to return it to its normal position to throw the controlling and press-head operating means out of operation and the means for imparting motion to the feeding means into operation.

6. In an automatic press, the combination with a box having longitudinal slots in its bottom and provided at one end with a baling chamber, a door for said chamber, means for feeding material to the box, and a press-head adapted to move forward and rearward in said box, of means for moving said press-head, means operating through the slots of the box for packing the material therein subsequent to the forward movement of the press-head, means for controlling the movement of the press-head set to operate by said packing means, and means operated by the press-head for opening the door of the baling chamber.

7. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, means for feeding material to the box, and a press-head adapted to move forward and rearward in the box, of bale tying means mounted on said box adjacent the baling chamber, means operating through the slots of the box for packing material therein subsequent to the forward movement of the press-head, means for moving the press-head forward and rearward set to operate by the packing means, said means being arranged to momentarily hold the press-head at rest at the end of its forward stroke, and means for operating the bale tying means while the press-head is thus at rest.

8. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, and means for feeding material to the box, of a press-head adapted to move in



said box, packing fingers adapted to project through the slots in the box, means for moving said fingers in the slots, and means arranged to permit the withdrawal of the fingers from the slots.

9. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, and means for feeding material to the box, of a press-head adapted to move forward and rearward in the box, means for operating and controlling the movement of said press-head, and packing devices operating in the box arranged to set the press-head operating and controlling means into operation.

10. In an automatic press, the combination with a box having a baling chamber at one end and provided with longitudinal slots in its bottom, and means for feeding material

to the box, of a press-head adapted to move forward and rearward in the box, a transmission shaft, press-head operating means, means for transmitting motion from the transmission shaft to the press-head operating means, means for controlling the transmission of motion to the press-head operating means, means for imparting motion to the transmission shaft, and means automatically set to operate for controlling the transmission of motion to the transmission shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT E. RAHM.

Witnesses:

FLYNN DAVIS,  
LELAN LEWIS.