

No. 682,514.

Patented Sept. 10, 1901.

L. WILSON.  
BALING PRESS.

(Application filed Mar. 29, 1901.)

(No Model.)

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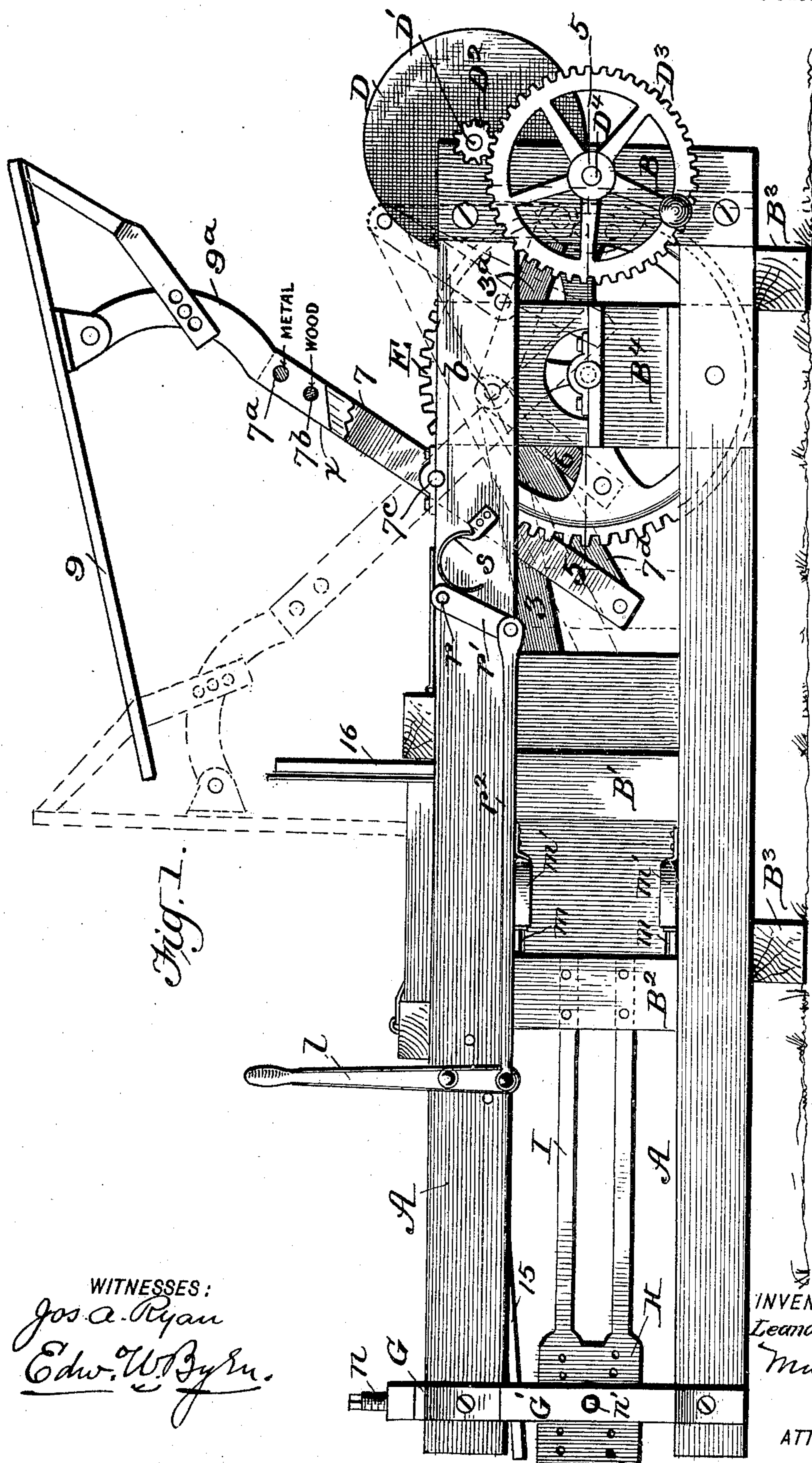


Fig. 1.

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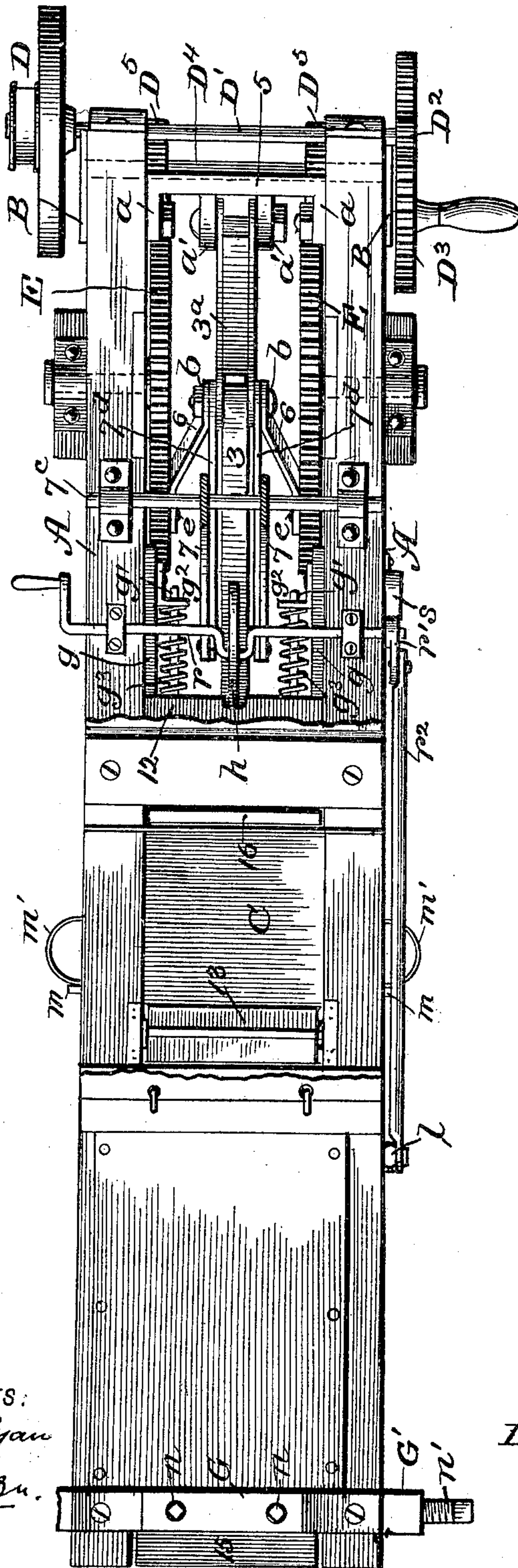
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Fig. 2.



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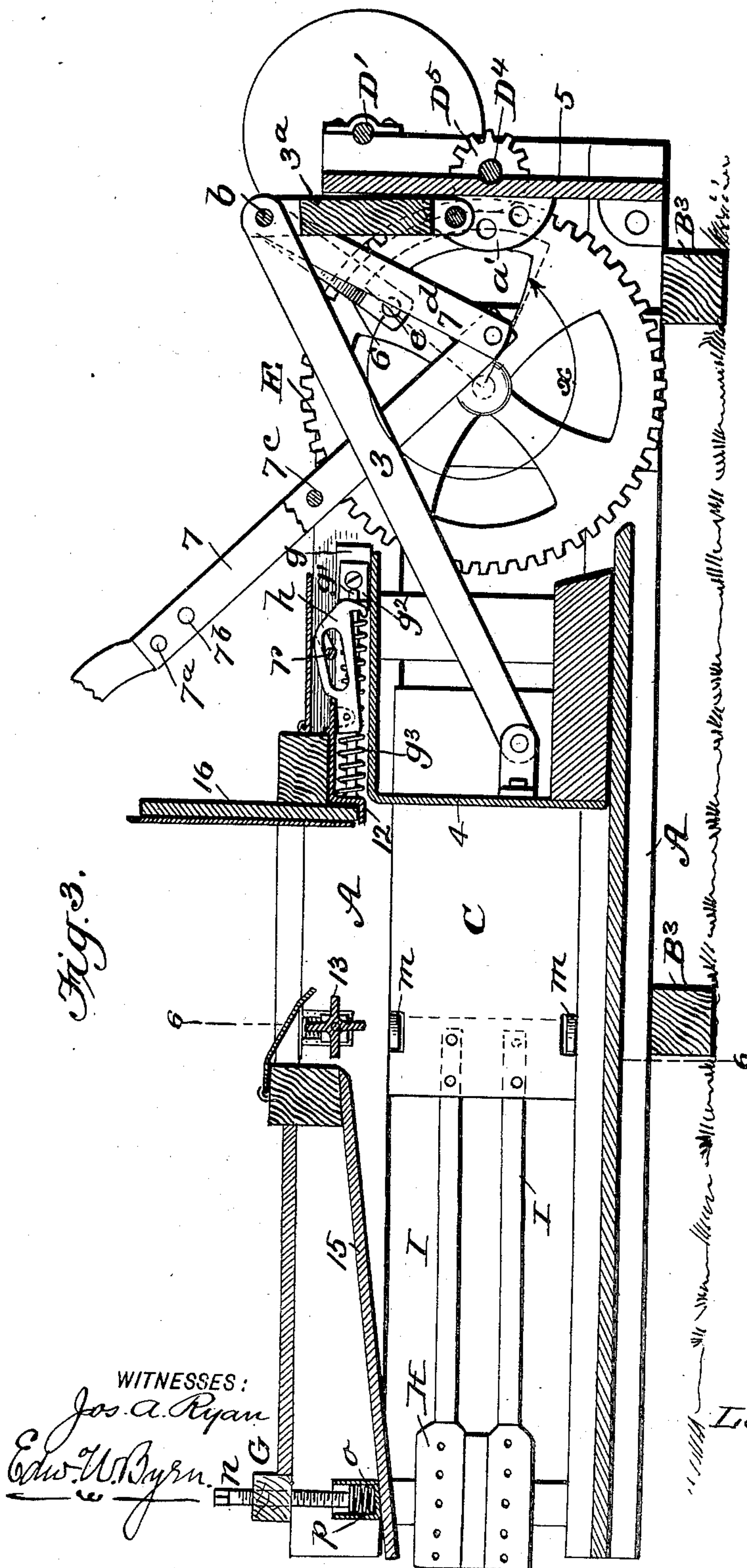
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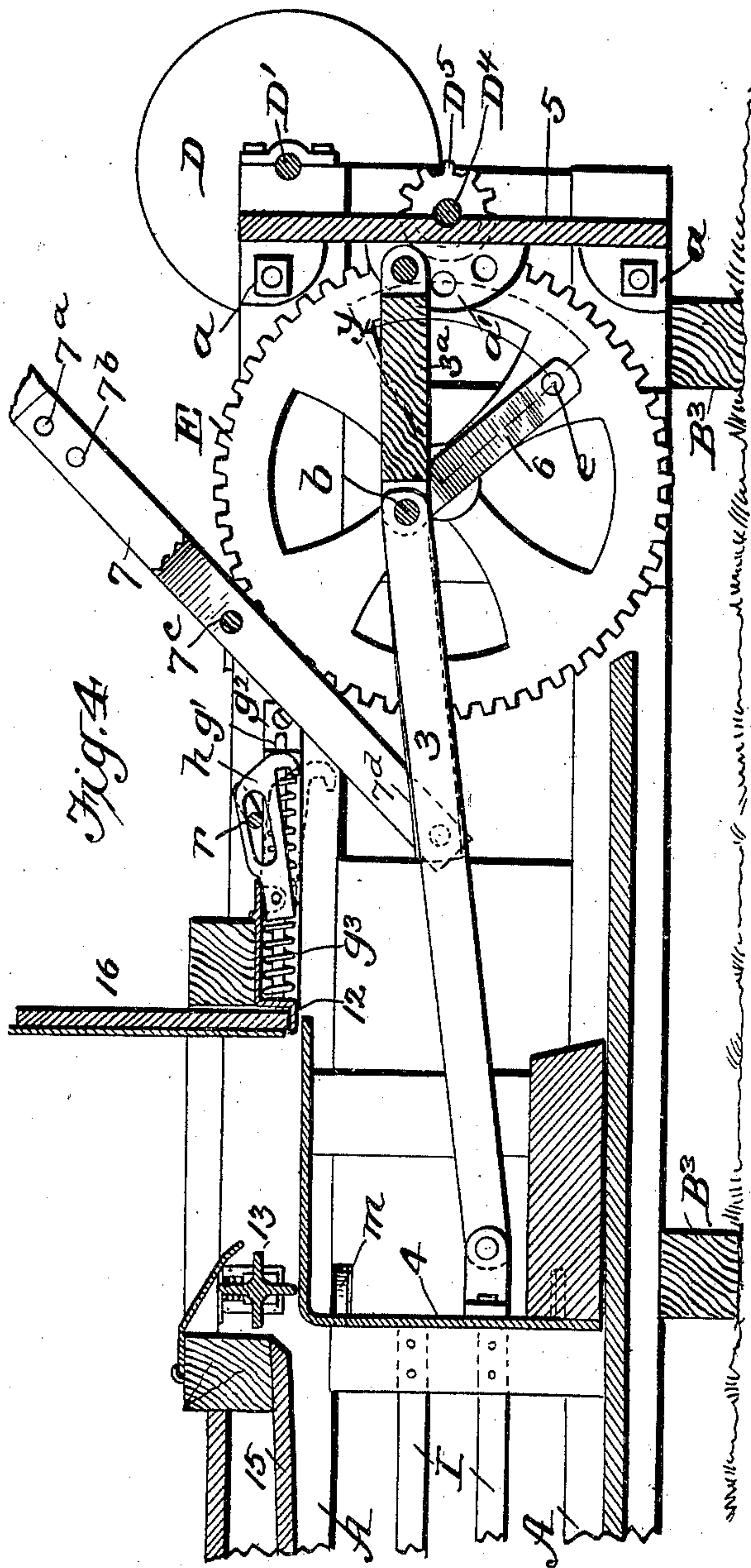
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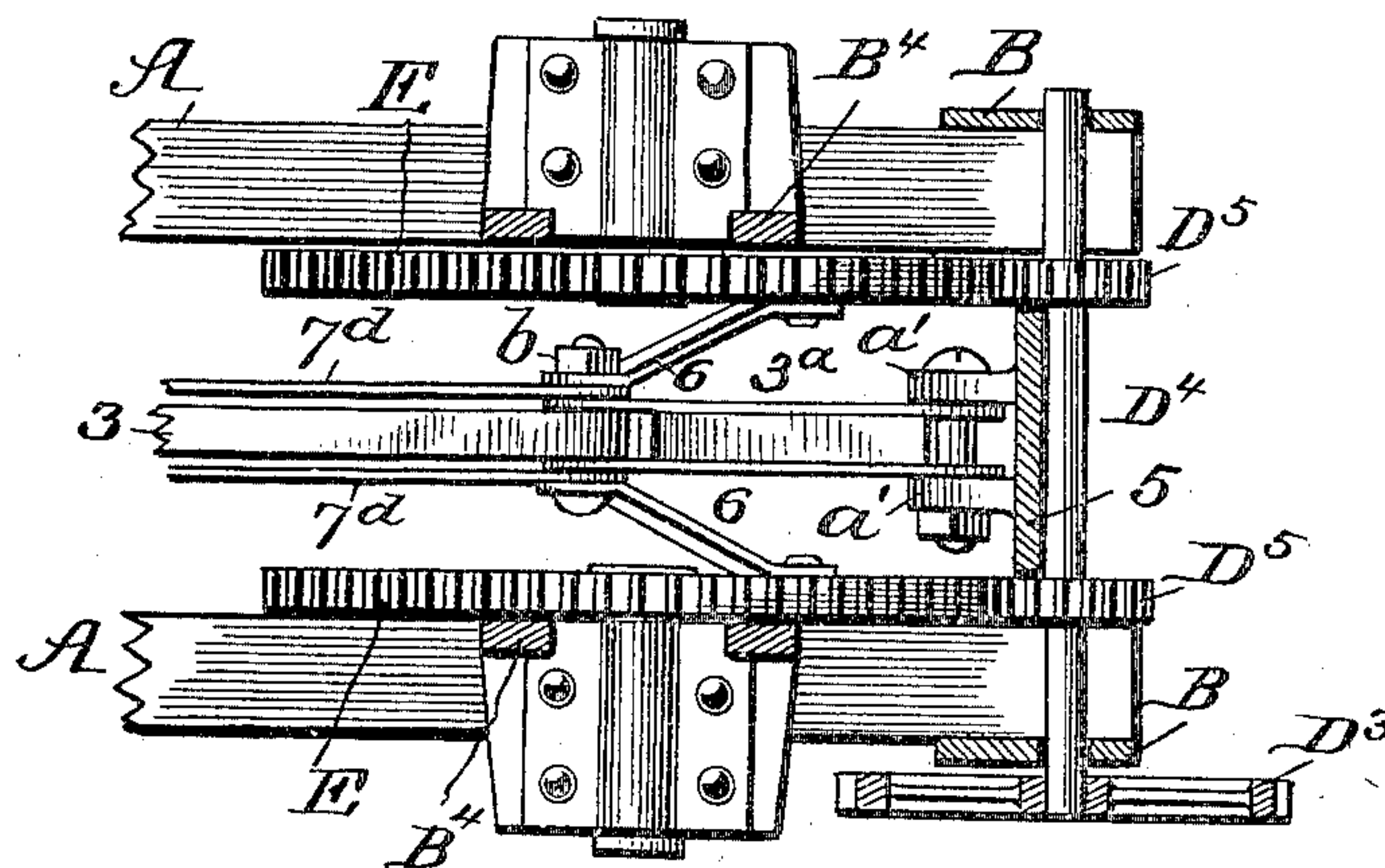
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*Fig. 5.*



*Fig. 6.*

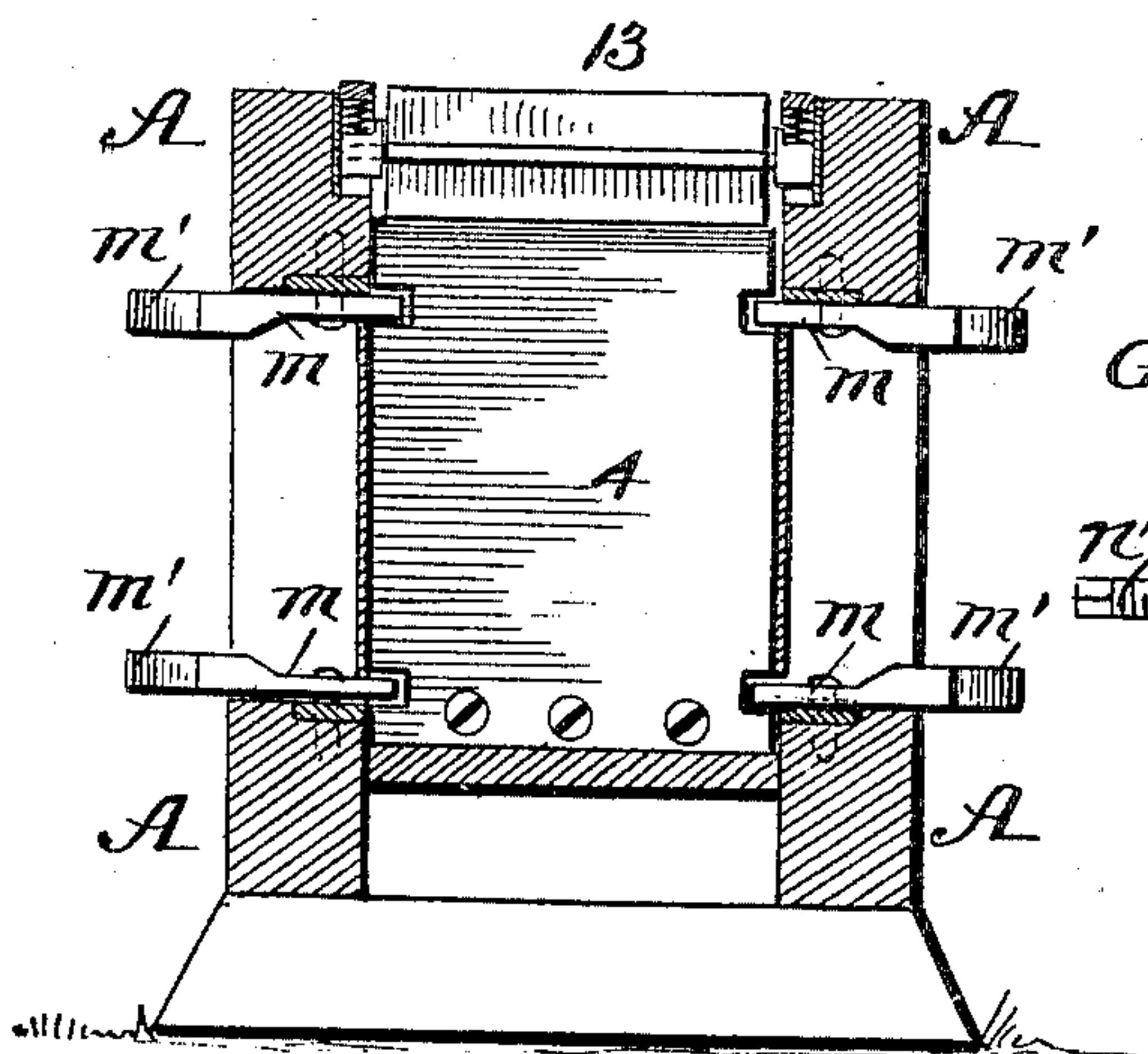


Fig. 7.

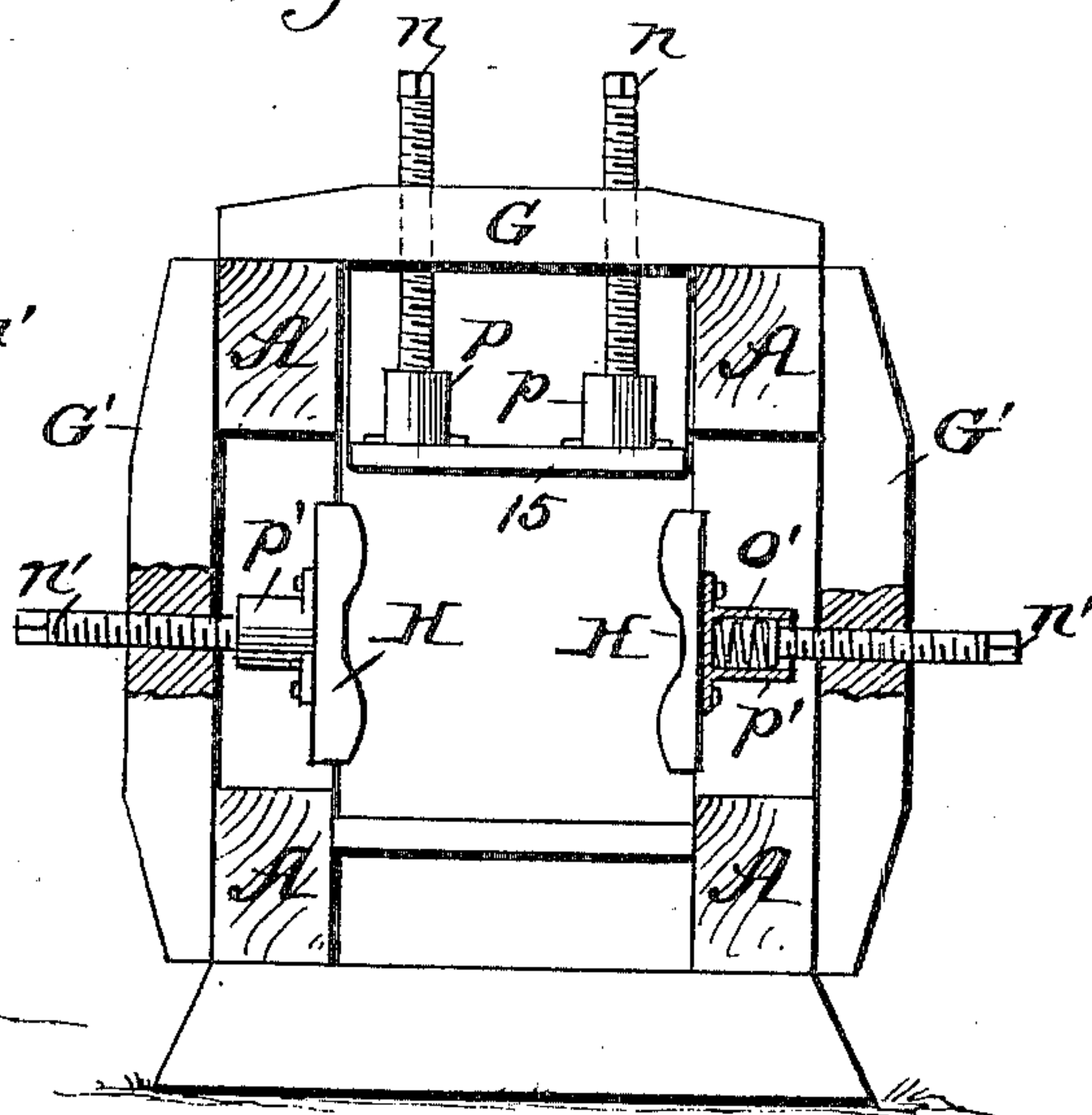
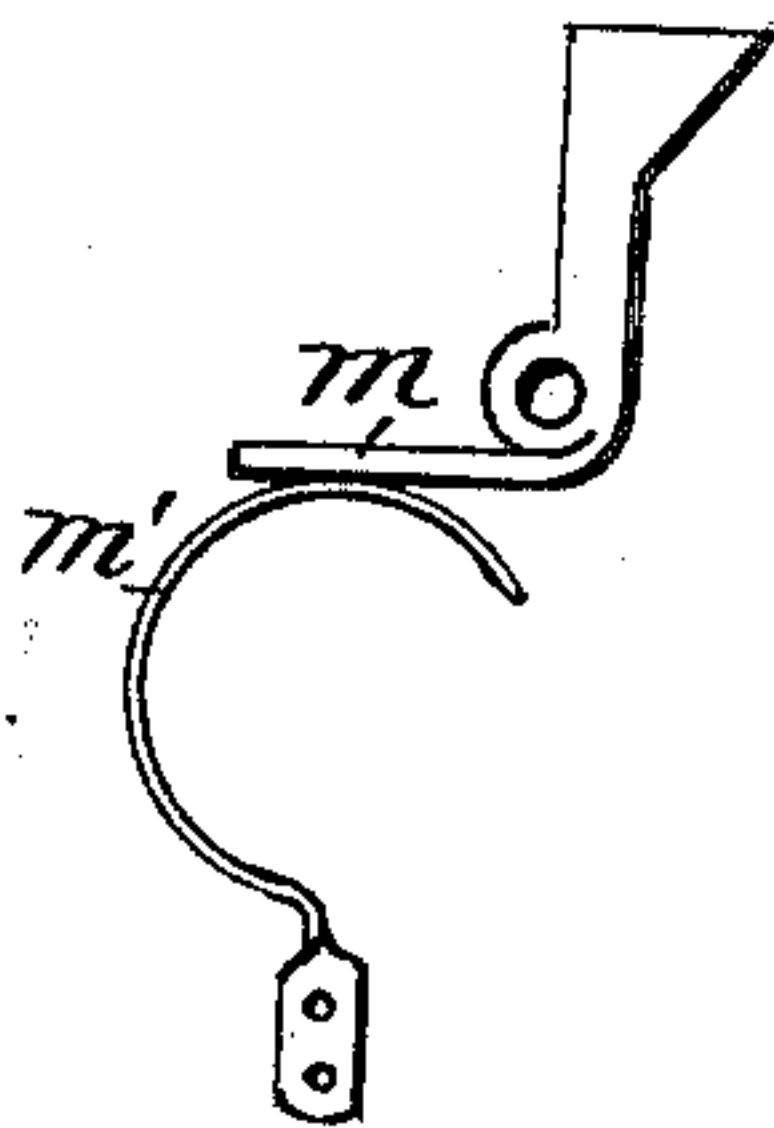


Fig. 8



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# UNITED STATES PATENT OFFICE.

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## BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 682,514, dated September 10, 1901.

Application filed March 29, 1901. Serial No. 53,554. (No model.)

*To all whom it may concern:*

Be it known that I, LEANDER WILSON, of Alpha, in the county of Henry and State of Illinois, have invented a new and useful Improvement in Baling-Presses, of which the following is a specification.

My invention relates to baling-presses of that form which are arranged horizontally and are continuously operated by belt-power and in which the plunger is worked within the casing by toggle arms and gears, the hay or other material being fed in laterally from the top in front of the plunger and packed by an oscillating board worked automatically, while separating partition-boards are introduced behind each bale of hay, which bales are successively forced out one end of the casing between tension devices, forming a throat or passage-way. My invention is designed to provide a greater compactness, strength, durability, simplicity, and power for this class of press; and it consists in various features of improvement, which I will now proceed to describe with reference to the drawings and then point out in the claims.

Figure 1 is a side elevation of the press, partly broken away. Fig. 2 is a plan view of the press, partly broken away. Fig. 3 is a vertical longitudinal section. Fig. 4 is a similar view through a portion of the press, showing another position of parts. Fig. 5 is a horizontal section in about the plane indicated by line 5 5 of Fig. 1. Fig. 6 is a vertical transverse section on line 6 6 of Fig. 3. Fig. 7 is an end view from the left-hand side of Fig. 1, and Fig. 8 is a detail.

In the drawings, A A A A represent the four longitudinally-arranged timbers of the press, which are connected by cross-bars B B' B<sup>2</sup> to form the horizontal frame, which is supported upon suitable base-bars B<sup>3</sup> B<sup>3</sup>. The middle part of this frame is inclosed upon its two sides and the bottom to form the feed-chamber C, Fig. 3, which opens at the top in the form of a hopper, through which the hay is introduced and is packed or fed by an oscillating board 9, Fig. 1. A plunger 4 reciprocates in one end of the feed-chamber, being operated by specially-arranged toggle arms and gears, hereinafter described, while on the left of the feed-chamber

the extension of the frame forms the baling-chamber with tension devices, through which the bales are pushed out one after the other in a continuous fashion.

I will first describe the construction and operation of the plunger and the oscillating feed-board, referring more especially to Figs. 1, 2, 3, 4, and 5.

D is the band-pulley, to which continuous rotation is given to drive the press. This driving-pulley is on one end of shaft D', journaled in boxes at the end of the frame, and said shaft at the other end carries a pinion D<sup>2</sup>, that meshes with a larger gear-wheel D<sup>3</sup> on a shaft D<sup>4</sup>, carrying two pinions D<sup>5</sup> D<sup>5</sup>. These pinions are on opposite sides of a strong metal thrust-plate 5, having flanges *aa* at top and bottom bolted to the ends of the timbers A and also through the metal cross-pieces B. This end plate receives the end thrust of the pressing action, and on it, about the center of its inner face, are formed lugs *a' a'*, between which is jointed one end of the short toggle-arm 3<sup>a</sup>, the other longer arm 3 of the toggle being jointed to the plunger 4. The pinions D<sup>5</sup> D<sup>5</sup>, Fig. 5, engage with the teeth of two main gear-wheels E E, which have long journals turning independently in elongated boxes in metal side plates B<sup>4</sup> B<sup>4</sup>. These gear-wheels E are connected by independent links 6 6 to the axial pin *b* of the toggle-arms 3 and 3<sup>a</sup>. Said links connect with the gear-wheels by wrist-pins *e*, located a distance from the center of the wheels equal to two-thirds the distance between the center and the circumference. This position and arrangement of the separate links to the joint of the toggle produces the effect of permitting the toggle-arms to be lowered to a position low down between the gear-wheels, making the mechanism more compact and direct in its action and also causing the plunger to be advanced to exert the pressing strain through four-fifths of the revolution of the said wheel (shown by arrow *x*, Fig. 3) and to withdraw the plunger by one-fifth of a revolution, (shown by arrow *y*, Fig. 4,) thus making a relatively slow and powerful compression and a quick backward movement of the plunger when no work is being done. This not only gives greater power, but gives a



longer time to feed and saves time on the back stroke. It also gives a quick and positive downward movement to the packing-board, as hereinafter described. This packing-board 9 has a brace connection at the top to its shank 9<sup>a</sup>. This shank 9<sup>a</sup> is connected in alinement with its operating-lever 7 by a metal pin 7<sup>a</sup> and a wooden break-pin 7<sup>b</sup>, the shank of the packing-board being inserted between the two thicknesses of the operating-lever. This produces an important result, for there is considerable strain on the packing-board, and if the hay is caked or tough the connections of the board are liable to break, as the momentum of the machine cannot be arrested, and if this breaking strain comes it merely breaks the pin 7<sup>b</sup> without doing harm to the other parts. To prevent the packing-board from dropping down from gravity in front of the plunger when the pin breaks, which would cause the packing-board to be mashed by the advance of the plunger, the end of the shank 9<sup>a</sup> of the packing-board is made inclined at  $\alpha$ , so as to lock against the end of the operating-lever, forming a knuckle that bends in one direction, but not in the other. The lever 7 is rigidly attached to a rock-shaft 7<sup>c</sup>, which is journaled in bearings on the top of the frame, and the lower end of said lever is branched and straddles the toggle-arm 3, (see Fig. 2,) and is at its lower end connected by links 7<sup>d</sup> to the middle toggle-joint. This causes the packing-board to rise and fall into the hopper, and its motion is differentiated like that of the plunger, so as to descend into the hopper with a quick positive packing blow and to rise more slowly. This gives a better packing action and more time for the insertion of hay into the hopper. When a sufficient quantity of material has been inserted into the hopper and packed by the successive advances of the plunger to form a bale, a partition-board is to be placed behind it and the plunger, made to act there-against and advance the bale to a position to be tied. Such partition-board is shown at 16, Figs. 3 and 4. It is held in an elevated position in front of the hopper by the devices which I am about to describe and at the proper moment is dropped automatically. This is accomplished by a sliding shelf 12, which supports said board until the time it is desired to fall, and said shelf is then hitched to the plunger by devices under the control of the operator, and the shelf being withdrawn the partition-board falls into the press-chamber in front of the plunger. The devices for temporarily connecting this shelf to the plunger are as follows: The shelf 12 slides on guides  $g$ , Fig. 2, on each side of the upper frame-bars, and is provided with rods  $g'$ , that pass through lugs  $g^2$ , coil-springs  $g^3$  being arranged on said rods so as to bear against the lugs  $g^2$  to render the shelf spring-seated, the springs holding the shelf in its forward position beneath the partition-board to support it in elevated position. Loosely connected

to the shelf there is a hook  $h$ , which has an elongated slot through it which receives the cranked portion of a rock-shaft  $r$ , bearing on its end a crank  $r'$ , which is connected by a rod  $r^2$  to a hand-lever  $l$ , fulcrumed to the frame and projecting vertically near the feed-hopper. When the hand-lever is deflected, it rocks the shaft  $r$  and lowers the hook  $h$  (see dotted lines, Fig. 4) into range of engagement by the top of the plunger, so that as the latter moves back by the power of the driving mechanism the same power is made to draw back the shelf against the tension of the springs and drop the partition-board. A spring  $s$ , Fig. 1, presses against the crank  $r'$  and holds the rock-shaft in such position as to lift the hook  $h$  out of range of the plunger at all times, except when at the will of the operator the lever is deflected. This automatic means for inserting the partition-board is a feature of importance, contributing to the safety of the life and limbs of the operator, which are frequently endangered in the act of inserting these partition-boards. The partition-board is held in front of the feed-chamber by means of four right-angular catches  $m$ , Figs. 3 and 6, two on each side, which project into the press-chamber and which yield and allow the partition-board to pass them and then hold said board against returning when the plunger moves back. These catches are forced inwardly by springs  $m'$  acting upon their outer arms. When the plunger passes through the feed-chamber, these catches disappear from the chamber, and when the plunger recedes the hooks reappear in the feed-chamber and retain the hay in place, so that another charge may be fed into the feed-chamber. Just above the catches and near the top of the frame and in the feed-hopper is arranged a revolving folder 13, having longitudinal vanes which turn as the hay is squeezed past the same in passing into the hopper and also out of the feed-chamber. This folder reduces the frictional drag of the hay, and it is journaled in bearings that are spring-seated and yield upwardly, as seen in Figs. 3, 4, and 6. This folder will be about one-half below the bale-chamber when empty. When in operation, the plunger-head is withdrawn and the folder will revolve and drop into position, one wing or blade acting as a retainer, while the opposite one tucks in the hay and holds it in such shape that at the return of the plunger-head it will pack the hay in front of the next charge, making each charge separate as it is forced into the bale-chamber.

I will now describe the tension devices for the bale after it has been formed by successive charges pushed out of the feed-chamber by the plunger. (See Figs. 3 and 7.) This consists of a yielding top board 15 and two side plates  $H H$ , connected to and supported by horizontal spring-shanks  $I I$ . There are four screws  $n n n' n'$ , two on top of the bale-chamber and one on each side, tapped through



metal cross-pieces G G' and adapted to be turned down or adjusted by a wrench applied to their squared ends. These screws bear against coil-springs o o', seated in cups p p', secured to the outer sides of the board 15 and plate H. These side plates H have each two parallel horizontal convex surfaces with a depression between them, which permits a bale-band to be passed around the 10 bale, while the top board is flat or plane. By giving these screws a turn to the right the tension is increased on all four sides of the emerging bale. Should wet or very damp material be fed into the press, the coil-springs 15 in the cups will permit a slight yielding to let the bale pass out without readjusting the screws, while in baling dry material the tension of the spring permits of sufficient frictional resistance on the bale to get the proper 20 number of pounds in the bale.

In pointing out the distinctive features of the pressing mechanism I wish to call attention to the separate links 6 6 for connecting the gear-wheels to the middle toggle-joint. 25 This permits the toggle-arms to be lowered and the machine made much more compact than when the drive-wheels are connected by a rod going across from one to another and having only a single link. It also gives room 30 for the forked lever of the packing-board to extend below the frame and be journaled directly on the frame and be connected with the toggle-joint in a more direct and compact way.

35 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A press comprising a framework with a reciprocating plunger and a single pair of 40 jointed toggle-arms, the outer arm being made short, an end-thrust plate jointed thereto, and the inner arm longer and jointed to the plunger, two gear-wheels arranged inside the framework and on opposite sides and having 45 on their adjacent faces wrist-pins located at points between their center and circumferences, a separate link connecting each wrist-pin to the middle joint of the toggle-arm, said toggle-arms being arranged between said links 50 substantially as described.

2. A press comprising a framework with a reciprocating plunger, and a single pair of jointed toggle-arms, the outer one being made short and jointed to an end-thrust plate, and 55 the inner arm longer and jointed to the plunger, two gear-wheels arranged inside the framework and on opposite sides and having on their adjacent faces wrist-pins as described,

a separate link connecting each wrist-pin to the middle joint of the toggle-arm, a packing-board and operating-lever said lever being fulcrumed directly on the main frame and having its lower end branched and straddling the toggle-arm and descending to a position between the gear-wheels and connected 65 by links to the middle joint of the toggle-arms substantially as described.

3. In a baling-press having a reciprocating plunger and toggle-arms for operating it, the combination with said toggle-arms of links 70 connected to their middle joint, two oppositely-faced gear-wheels having wrist-pins connected to said links and long journals extended outwardly, and a metal frame-plate B<sup>4</sup> bolted to the framework and having extended journal-bearings for said gear-wheels 75 substantially as described.

4. In a baling-press having an automatically-operated packing-board, the operating-lever for said packing-board made in two 80 jointed sections with a breakable pin for rendering them rigid, the joint of said sections being constructed as a knuckle yielding in one direction only to prevent the board from dropping in front of the plunger and being 85 destroyed, when the brake-pin is broken substantially as described.

5. In a baling-press of the kind described, the combination with the feed-chamber having a slot-opening beside the hopper, a sliding 90 shelf for closing said opening and sustaining the partition-board, springs for holding said shelf to said position, a loosely-coupled hook fastened to the said shelf and arranged to be dropped down into range of engagement 95 with the plunger, and a rock-shaft with crank-arm and operating devices for rocking the same to drop the hook substantially as shown and described.

6. In a baling-press of the kind described, 100 the combination with the feed-chamber having a slot-opening beside the hopper, a sliding shelf for closing said opening and sustaining the partition-board, horizontal guide-rods 105 with coil-springs around them for holding the shelf across the opening, a loosely-coupled hook attached to the shelf and having an elongated slot, a horizontal crank-shaft arranged in said slot, and a lever and connecting-rod for working said rock-shaft and 110 raising or lowering the hook substantially as shown and described.

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Witnesses:

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