(No Model.) 2 Sheets—Sheet 1.

R. H. IRELAND.

BEAM FRAMING MACHINE.

No. 521,654. Patented June 19, 1894.

Fig. 1

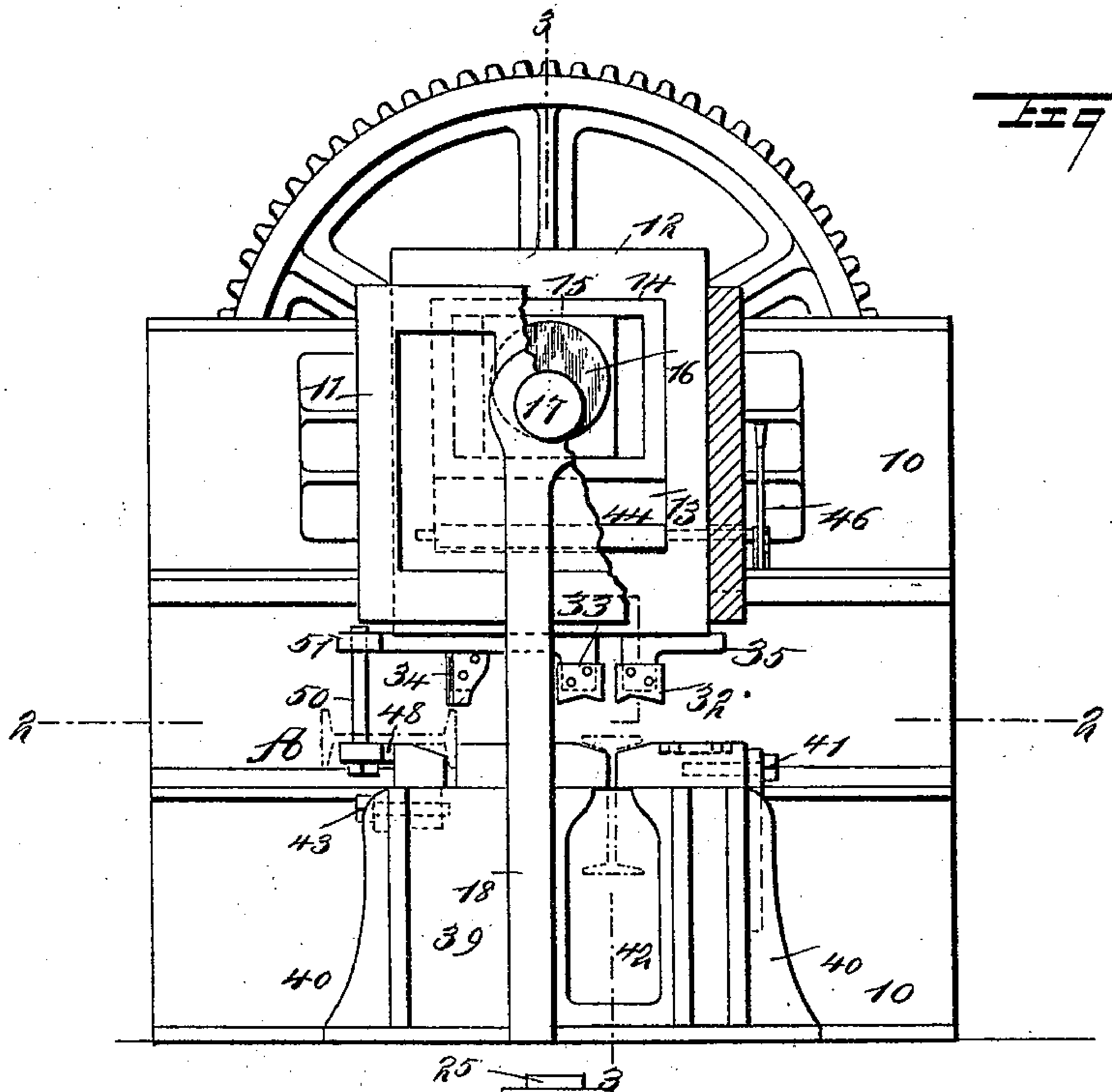
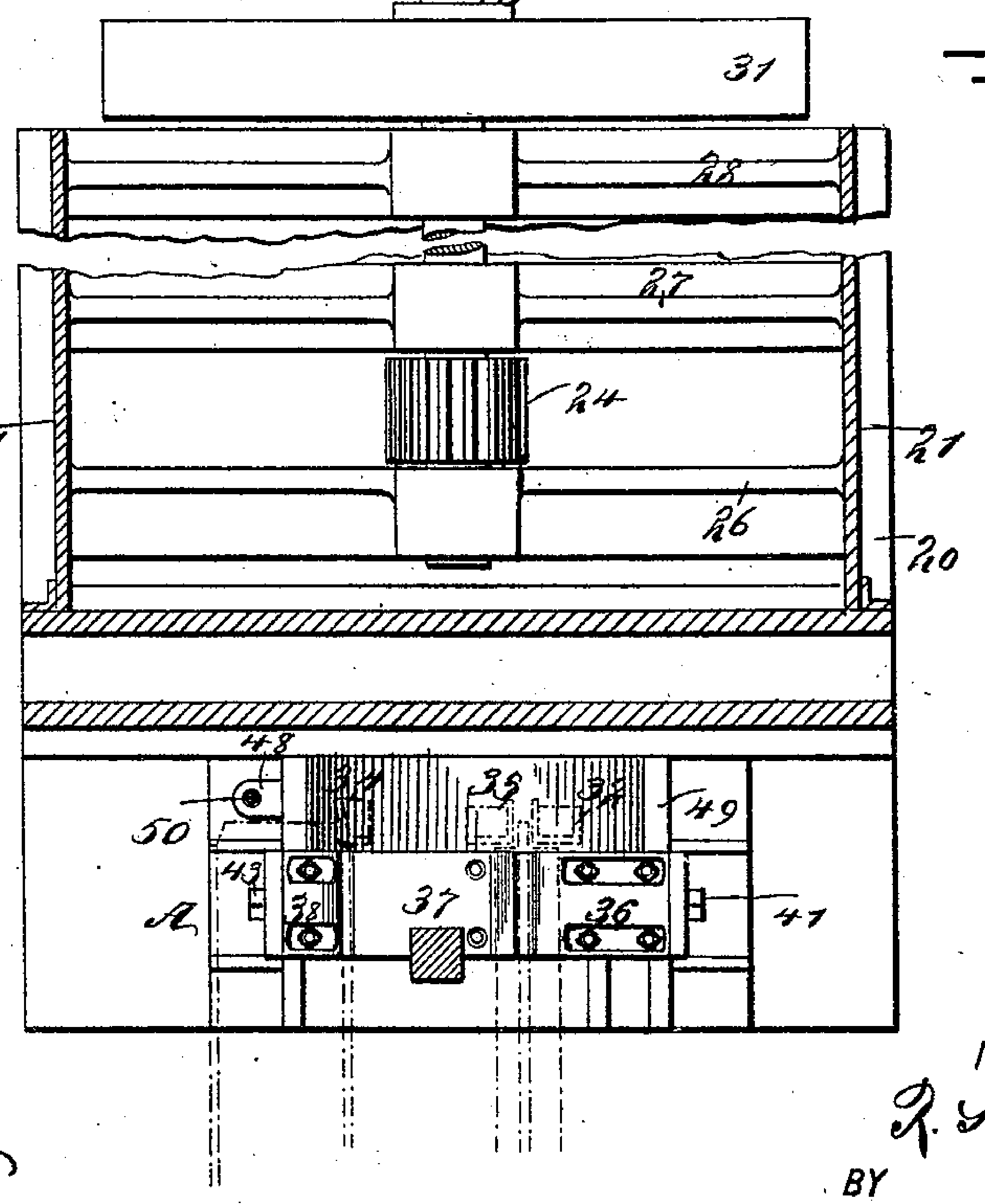


Fig. 2



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

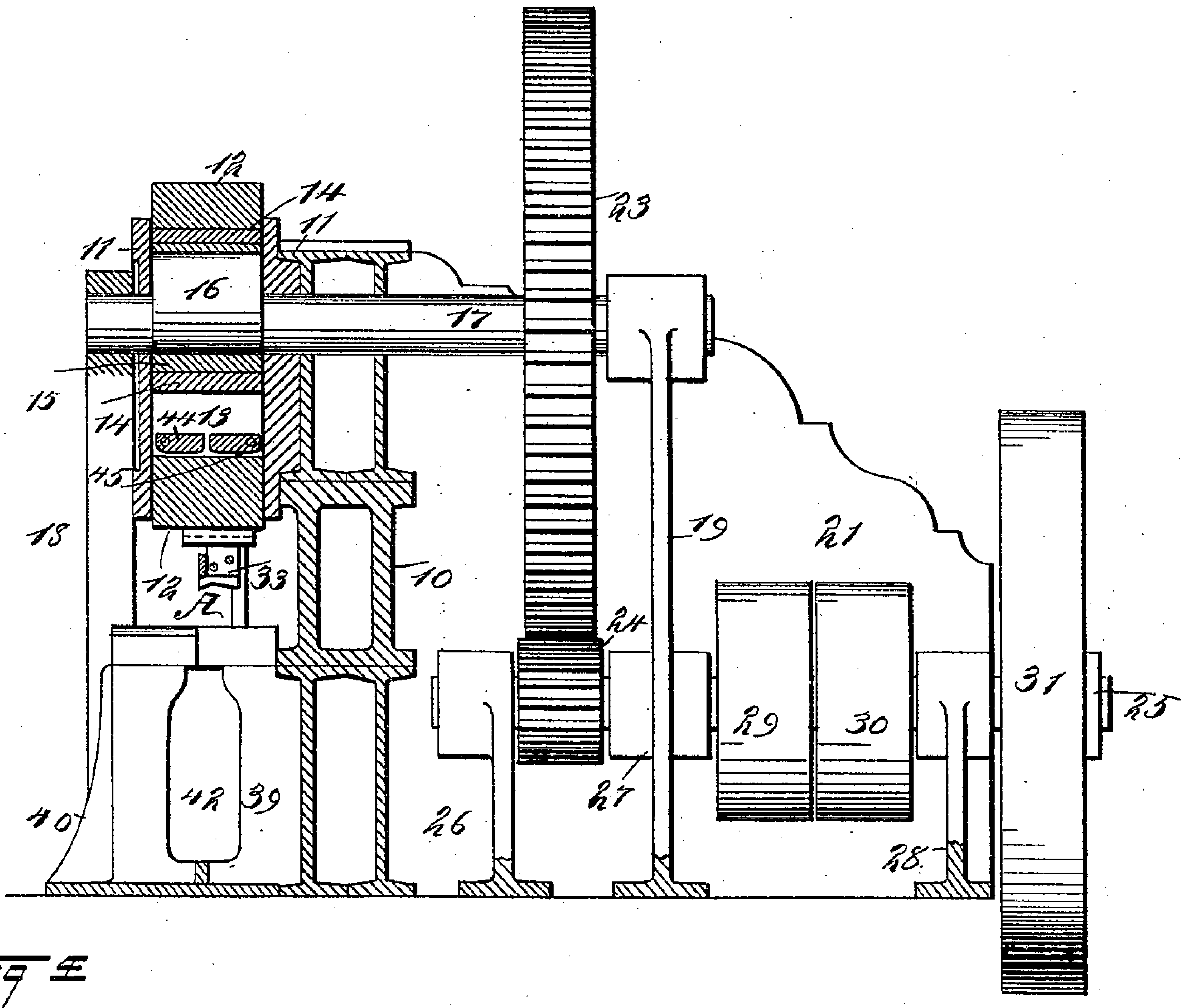


Fig. 4

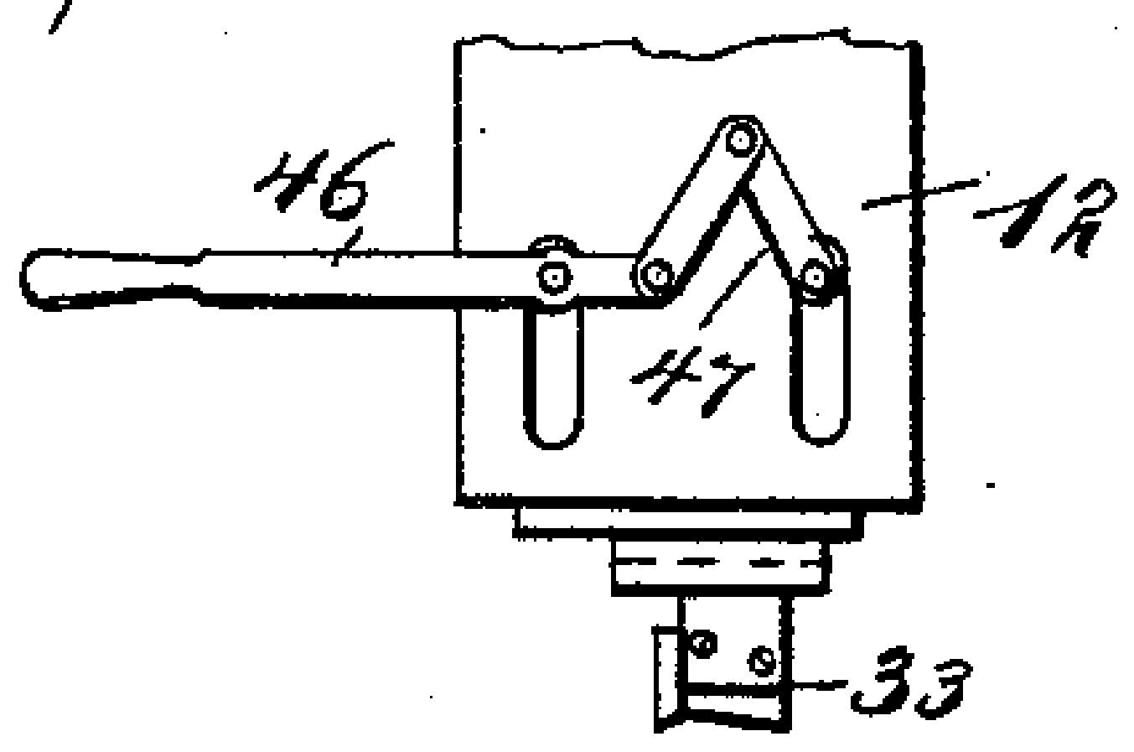


Fig. 5

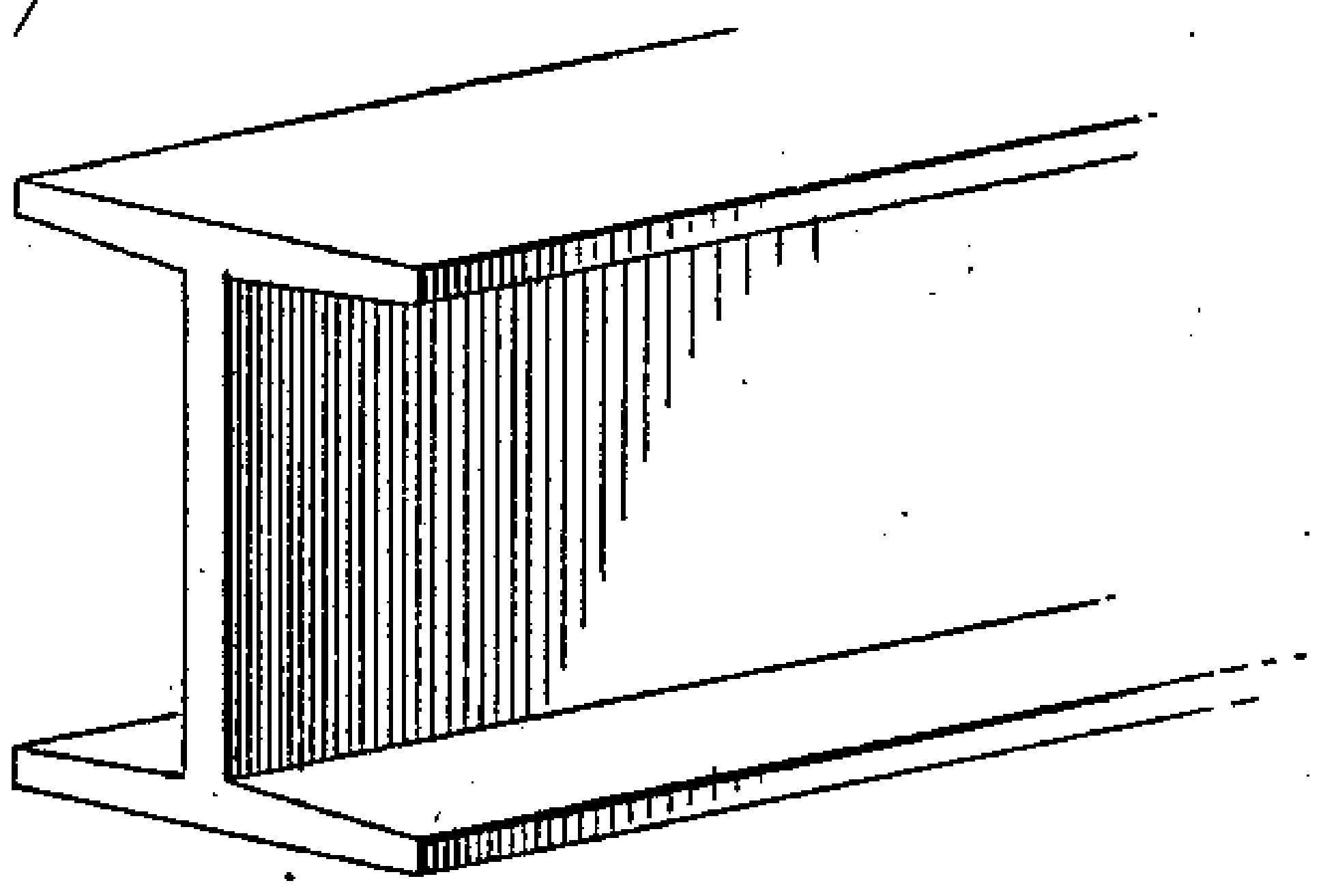


Fig. 6

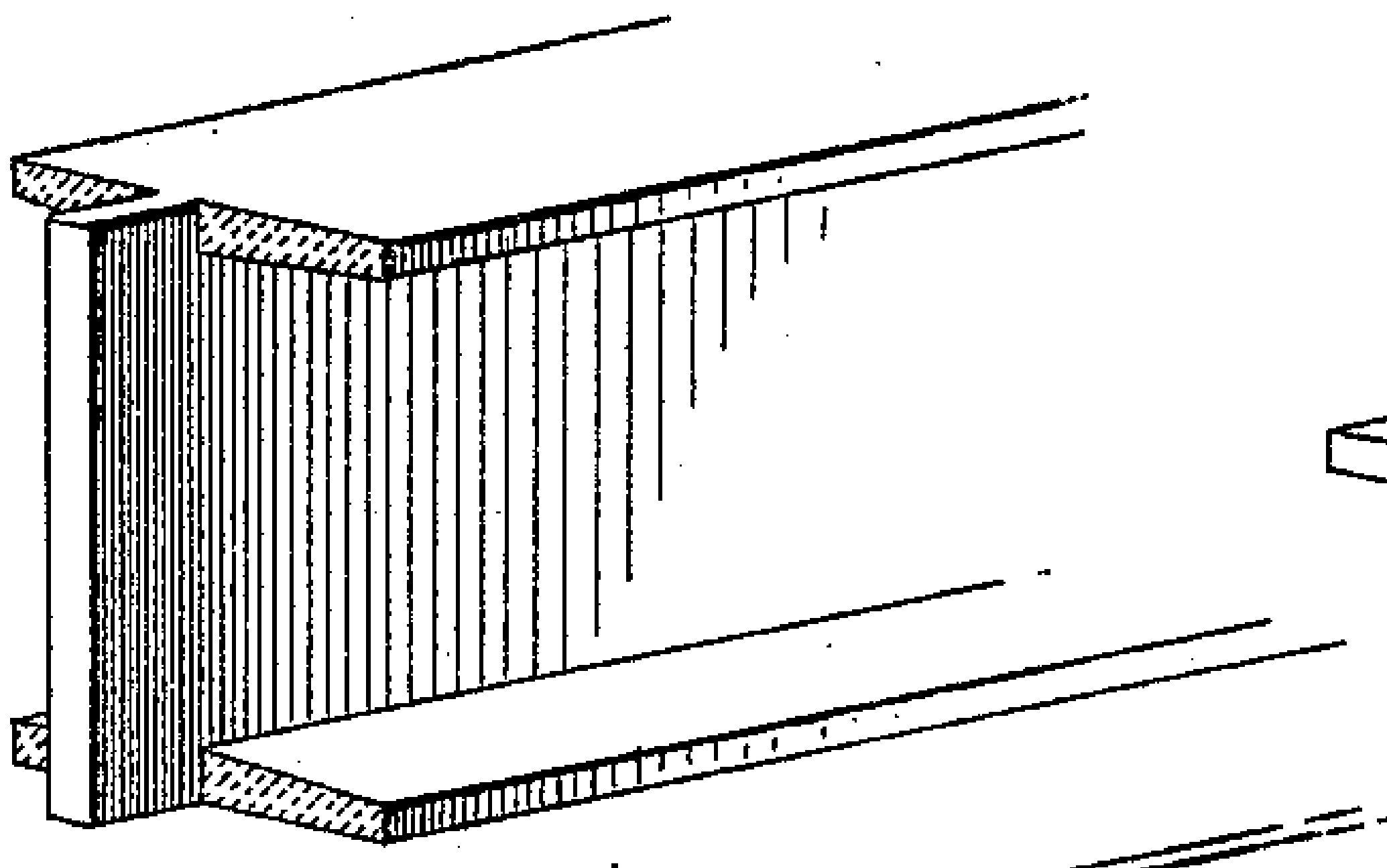
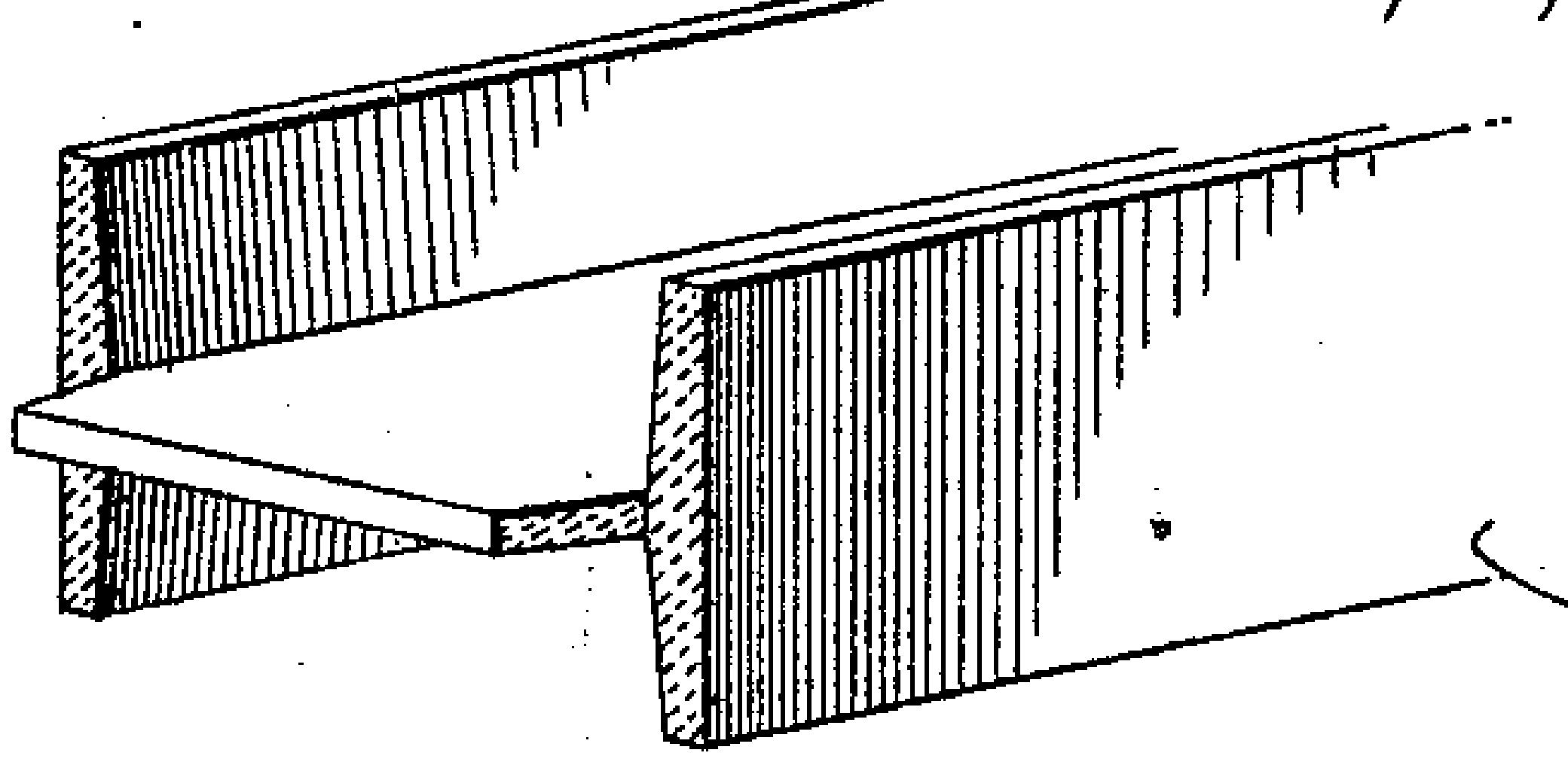


Fig. 7



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UNITED STATES PATENT OFFICE.

ROBERT H. IRELAND, OF NEW YORK, N. Y.

BEAM-FRAMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,654, dated June 19, 1894.

Application filed October 25, 1893. Serial No. 489,099. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. IRELAND, of New York city, in the county and State of New York, have invented a new and Improved Beam-Framing Machine, of which the following is a full, clear, and exact description.

My invention relates to a beam-framing machine, and it has for its object to provide a machine through the medium of which the ends of beams, such as for example eye-beams, may be cut or trimmed in a manner to adapt them especially for framing.

A further object of the invention is to construct a machine of the character above described, which may be of simple, durable and economic construction, and whereby the beams may be expeditiously and effectually operated upon.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is an end view of the machine, parts being broken away and in section. Fig. 2 is a horizontal section taken practically on the line 2—2 of Fig. 1. Fig. 3 is a vertical longitudinal section taken substantially on the line 3—3 of Fig. 1. Fig. 4 is a detail view of the shifting mechanism employed in connection with the machine; and Figs. 5, 6 and 7 are perspective views of a beam, illustrating said beam before being cut, when partially cut, and when completed.

In carrying out the invention a vertical wall 10, is erected, preferably of grouped beams; or the said wall may be hollow or tubular, and the wall is adapted to support one side of a box or casing 11, which box or casing is open at its top and at its bottom, and is adapted to constitute a slide-way for a frame 12. The box is usually made rectangular, and the frame is of like construction.

The frame 12, is provided with a rectangular opening 13, of such size that the frame is rendered more or less of a skeleton formation; and in the upper part of said opening a box 14, has vertical movement, and in the said box an eccentric strap 15 of preferably rectangular exterior contour is capable of horizontal movement. The eccentric strap 15, is made to fit an eccentric 16, said eccentric being fast upon a driven shaft 17, and said shaft is journaled in preferably the central portion of the wall 10, and in an upright 18, located at one end of the machine. The driven shaft 17, is likewise journaled at its opposite end in a standard 19, projected upward preferably from a base plate 20, which base plate constitutes a portion of the frame, the entire frame of the machine consisting practically of the wall 10 and side plates 21, connected with the ends of the wall at the rear faces thereof. The base of the standard 19, is preferably made to extend from one side plate 21 to the other, and the driven shaft 17 receives motion by providing said shaft with a large gear 23, meshing with a pinion 24 located upon a line shaft 25, said line shaft being journaled in hangers or standards 26, 27 and 28 located upon the bed plate. The standard or hanger 27 may constitute a portion of the upright or standard 19. The drive shaft carries a fast and a loose pulley designated respectively as 29 and 30, and a driving pulley 31.

Knives are carried by the frame 12, being secured to its under surface, and ordinarily three knives are employed, two designated as 32 and 33 being arranged quite close together, and they are adapted for cutting the top and bottom flanges of the beam at its end, while a third knife 34, is employed to cut the web. The knives 32 and 33, are made substantially **L**-shaped in general contour, as shown in dotted lines in Fig. 2, and all of the knives, as heretofore stated, are secured to extensions 35 of the frame 12, which extensions may be made adjustable in the frame, if in practice it is found desirable. The bottom edges of the knives 32 and 33, are made more or less angular in order that they may cut to greater advantage, and the knife 34, which is adapted to cut the web portions of the beams, is approximately **L**-shaped, one member being arranged at an obtuse angle to the other instead of at a right angle.

A table A, is located beneath the knives, and the said table preferably consists of three blocks designated respectively as 36, 37 and 38. These blocks are supported upon uprights or legs 39, and the said legs are preferably strengthened by angled braces 40, or their equivalents, employed to support the tables, or a single leg may be used, in which event the leg is made hollow in the interest of lightness, as shown in Fig. 3. The two blocks 36 and 37 are adapted to support a beam when its flanges are being cut by the knives 32 and 33. To that end the block 37 is stationary while block 36, is adjustable to and from the block 37, through the medium of an adjusting screw 41, and the upper faces of the opposing ends of the opposing blocks 36 and 37, are beveled downward in direction of their opposing ends, the bevel being made to correspond to the bevel of the inner surfaces of the beam flanges; and the leg 39 immediately beneath the space between the blocks 36 and 37, has an opening 42 produced therein, into which the portion of the beam not being operated upon may extend. The block 38, is adjustable to and from the block 37, by means of a set screw 43. The top surface of the end of the block 38 facing the block 37, is beveled, as shown in Fig. 1, but the opposing surface of the block 37, is straight as shown in the same figure.

When the beams are being shifted it is desirable that the knives should not be operated, and as the driven shaft 17, is intended to be constantly in motion, the knives may be thrown out of gear through the simple mechanism shown in Figs. 1, 3 and 4, which consists in pivoting in the opening or chamber 13 of the frame 12, at the bottom of said opening or chamber, two opposing leaves 44 and 45, and the said leaves are adapted to fold in direction of one another, flat upon the base wall of the said chamber, and when so folded the eccentric may continue to throw the box 14 up and down in the frame without imparting movement to the latter; but when the leaves are carried to a vertical position the eccentric box, as the shaft revolves, will engage with the said leaves and force the frame carrying the knives to travel upward and downward in a regular manner. The leaves are reversed through the medium of a lever 46, which is attached to the pivot of one of the leaves at one end, as shown in Fig. 1, said lever being connected in a corresponding manner with the opposite leaf through the medium of links 47, as shown in Fig. 4.

In order to insure the knife-carrying frame 12 having positive guided movement, an arm 48 is projected from a block 49 supported by the legs 39 and filling the space between the rear sides of the blocks 36, 37 and 38 and the wall 10. The arm 48 is provided at its outer end with a pin 50, which is made to pass through an eye 51, connected with the under surface of the said knife-carrying frame.

In operation, a beam is placed with one flange upward, the flange resting upon the inclined surfaces of the opposing blocks 36 and 37 of the table A, as shown in dotted lines in Figs. 1 and 2. The web of the beam extends through the openings between these blocks. The beam is so adjusted that its end will be beneath the knives 32 and 33, and when the knives descend, the upper flange will be cut at opposite sides of the web as shown in Fig. 6, leaving the web intact. The beam is then reversed and the opposite flange is brought under the knives. When both flanges have been trimmed off, as shown in Fig. 6, the next step will be to cut the ends of the web exposed by the cuts in the flanges, upon a bevel, the bevel being in direction of the center of the web. This is accomplished by the knife 34, the beam being placed upon the table block 38 and engaged with the block 37, as shown to the left in dotted lines in Fig. 1 and likewise in Fig. 2. The descending knife will cut into the web, removing the web from engagement with the flange and leaving the inclined surface of the web as shown in Fig. 7. In this manner, and by means of the simple machine above set forth iron beams may be shaped for framing purposes in the shop, and when the beams are to be set up they need only be put in place.

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

1. In a beam framing machine, a knife head, mechanism for reciprocating the same, knives constructed substantially as described, carried by the head, and a table located beneath the knives, fitted to support a beam in an upright and horizontal position, the said table having adjustable portions whereby the openings to receive the beams may be increased or decreased in size, substantially as and for the purpose specified.

2. In a beam framing machine, a reciprocating knife head, knives of substantially angular construction arranged in pairs and connected with the head, and a knife likewise connected with the head, of angular construction, one member of the knife being at an obtuse angle to the opposing member, a driving mechanism connected with the knife head, and a table shaped to receive a beam in a horizontal or vertical position, and having adjustable portions to increase or decrease the size of the openings to receive the beams as and for the purpose set forth.

3. In a beam framing machine, a reciprocating knife head, a mechanism for driving the same, substantially as shown and described, knives attached to the said head, adapted to cut the flanges of beams, said knives being substantially L-shaped in cross section, a knife likewise carried by the head, adapted to cut the side edges of the web of a beam, said knife comprising two members arranged at an obtuse angle to each other, and a table located beneath the knives, shaped to receive

and support beams in a horizontal or vertical position, the said table having a stationary block and adjustable blocks arranged at opposite sides of the stationary block as and for the purpose set forth.

4. In a beam framing machine, the combination with a box or casing and supports therefor, a driving shaft provided with an eccentric, a knife head consisting of a frame having vertical movement in the casing, and provided with a rectangular opening, a box having vertical movement in the opening in the frame or knife head, and a strap connected with the eccentric and having horizontal movement in the box, of a mechanism located in the opening in the knife head at the bottom thereof for placing the head in communication with the sliding box, knives carried by the said head, adapted to cut the ends of the flanges of iron beams and the side edges of the web of the beams, and a table located beneath the knives and shaped to support the beams in a horizontal or perpendicular position, the said table being slotted and having adjustable blocks to increase or decrease the size of the openings to receive the beams, as and for the purpose set forth.

5. In a beam framing machine, the combination with a box or casing and supports therefor, a driving shaft provided with an eccentric, a knife head consisting of a frame having vertical movement in the casing and provided with a rectangular opening, a box having vertical movement in the opening in the frame or knife head and a strap connected with the eccentric and having horizontal movement in the box, of the leaves pivoted in the lower part of the opening in the frame or knife head for placing the knife head in communication with its sliding box, means for raising and lowering said leaves, substantially as described, knives carried by the said head, and a table located beneath knives, as and for the purpose specified.

ROBERT H. IRELAND.

Witnesses:
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CHAS. A. HENNESSEY.