

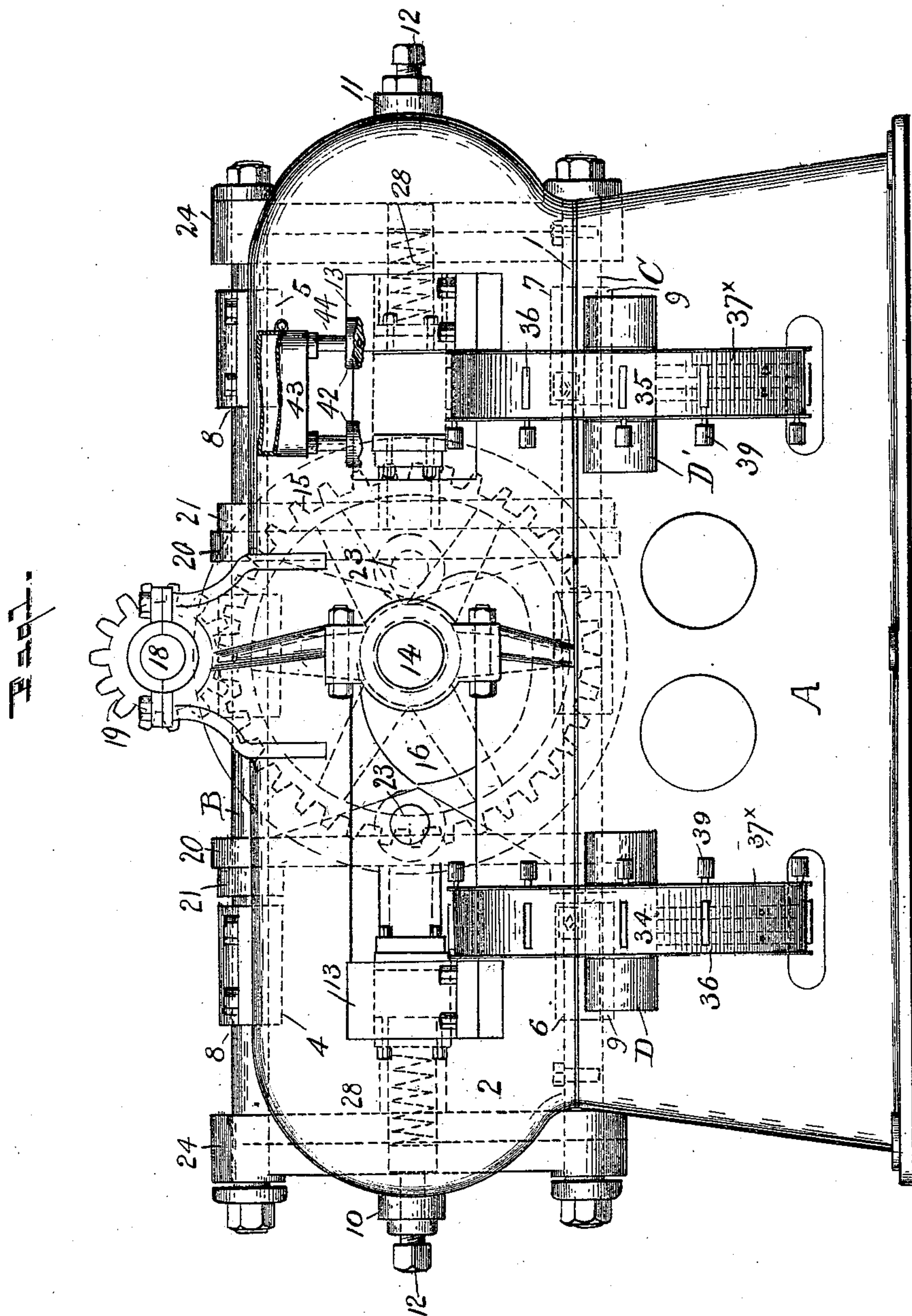
(No Model.)

4 Sheets—Sheet 1.

J. A. FREY.
RE-PRESS BRICK MACHINE.

No. 541,528.

Patented June 25, 1895.



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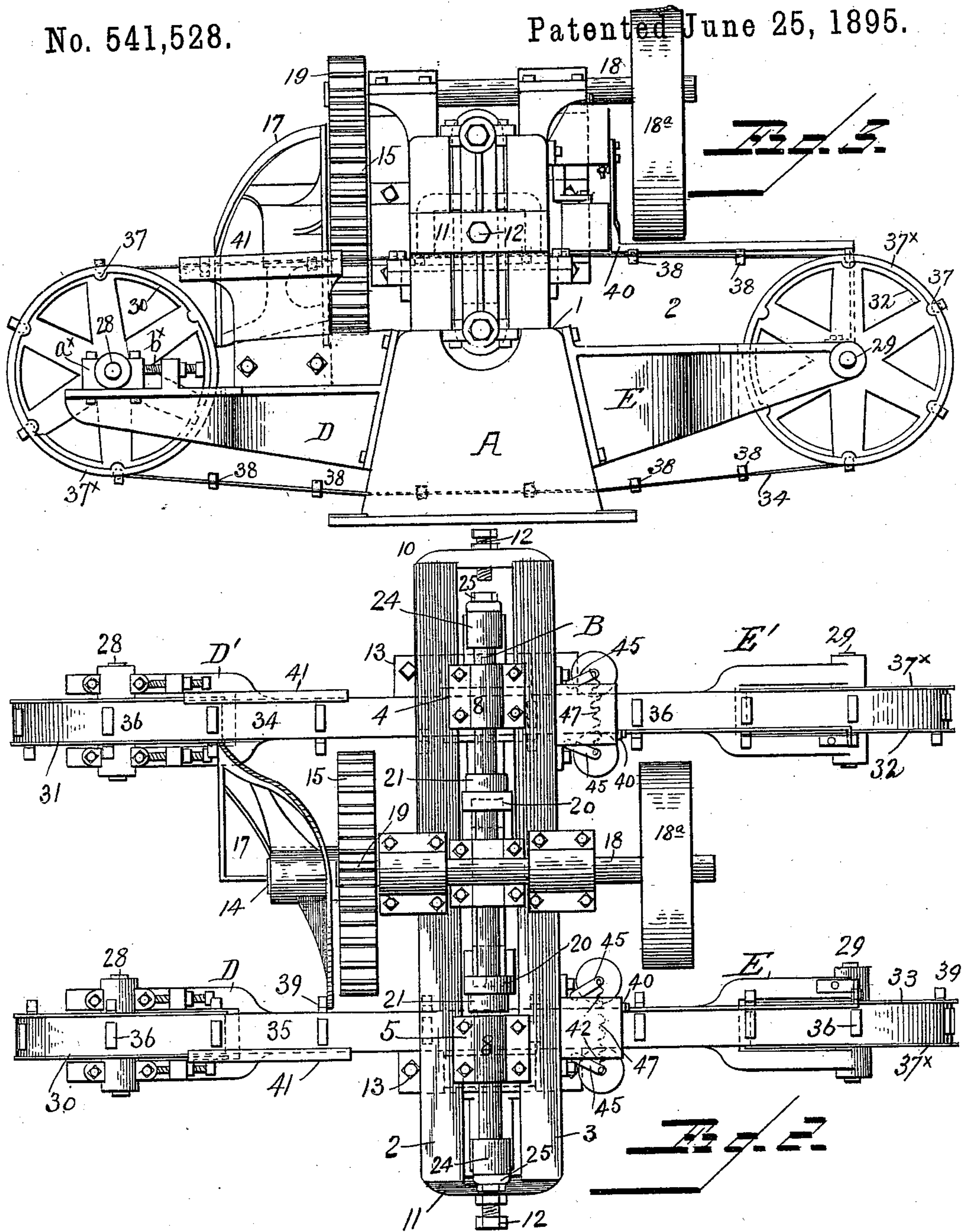
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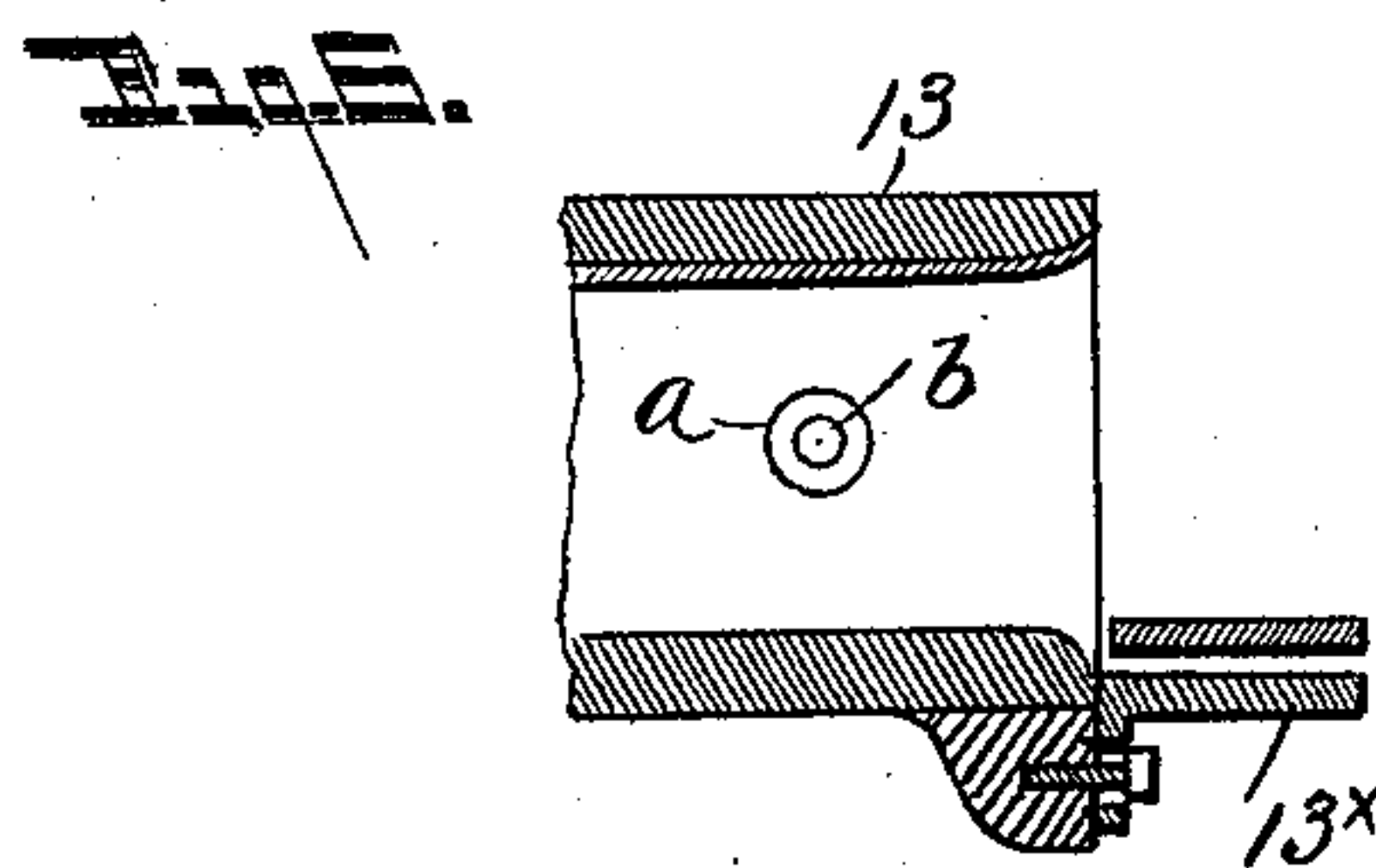
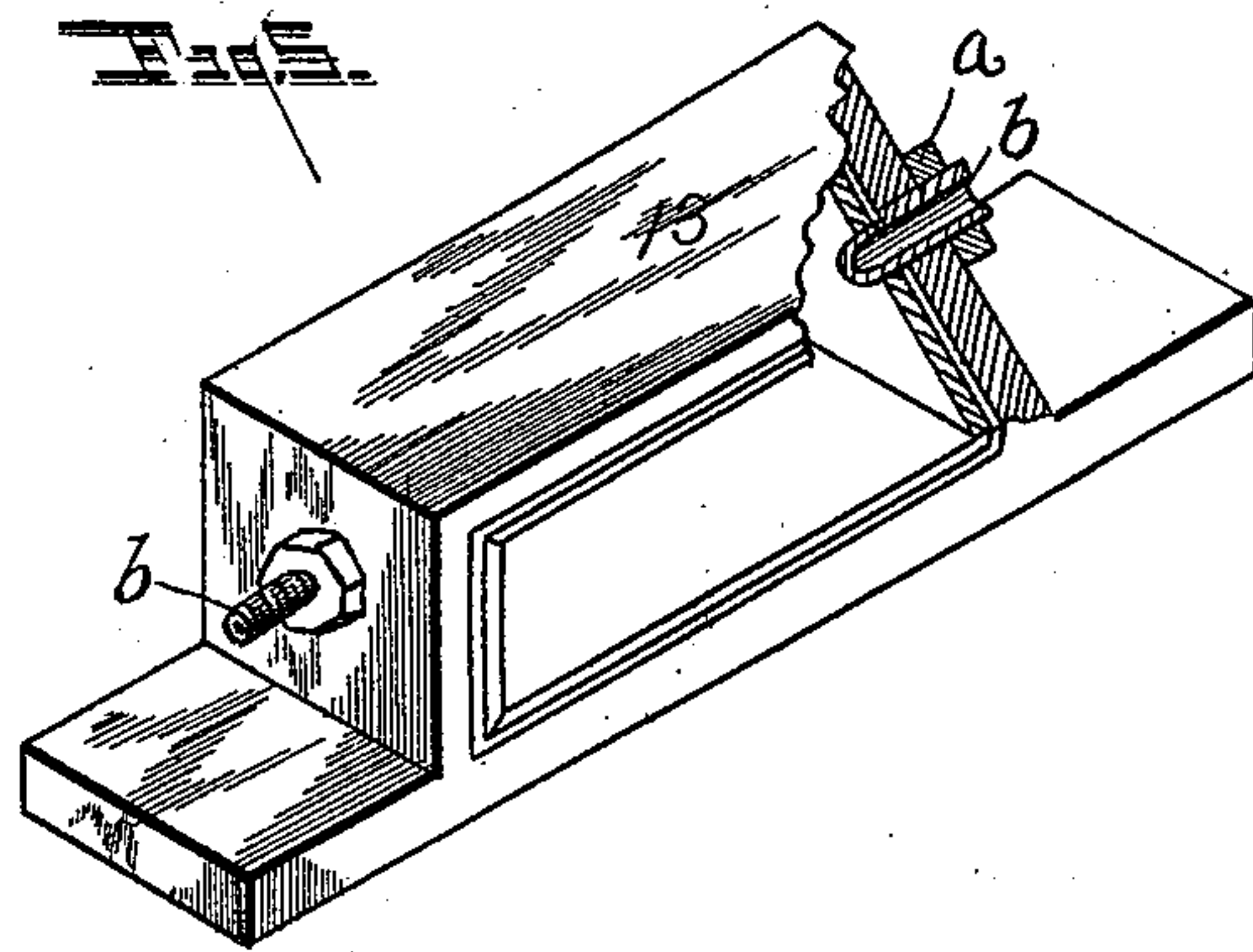
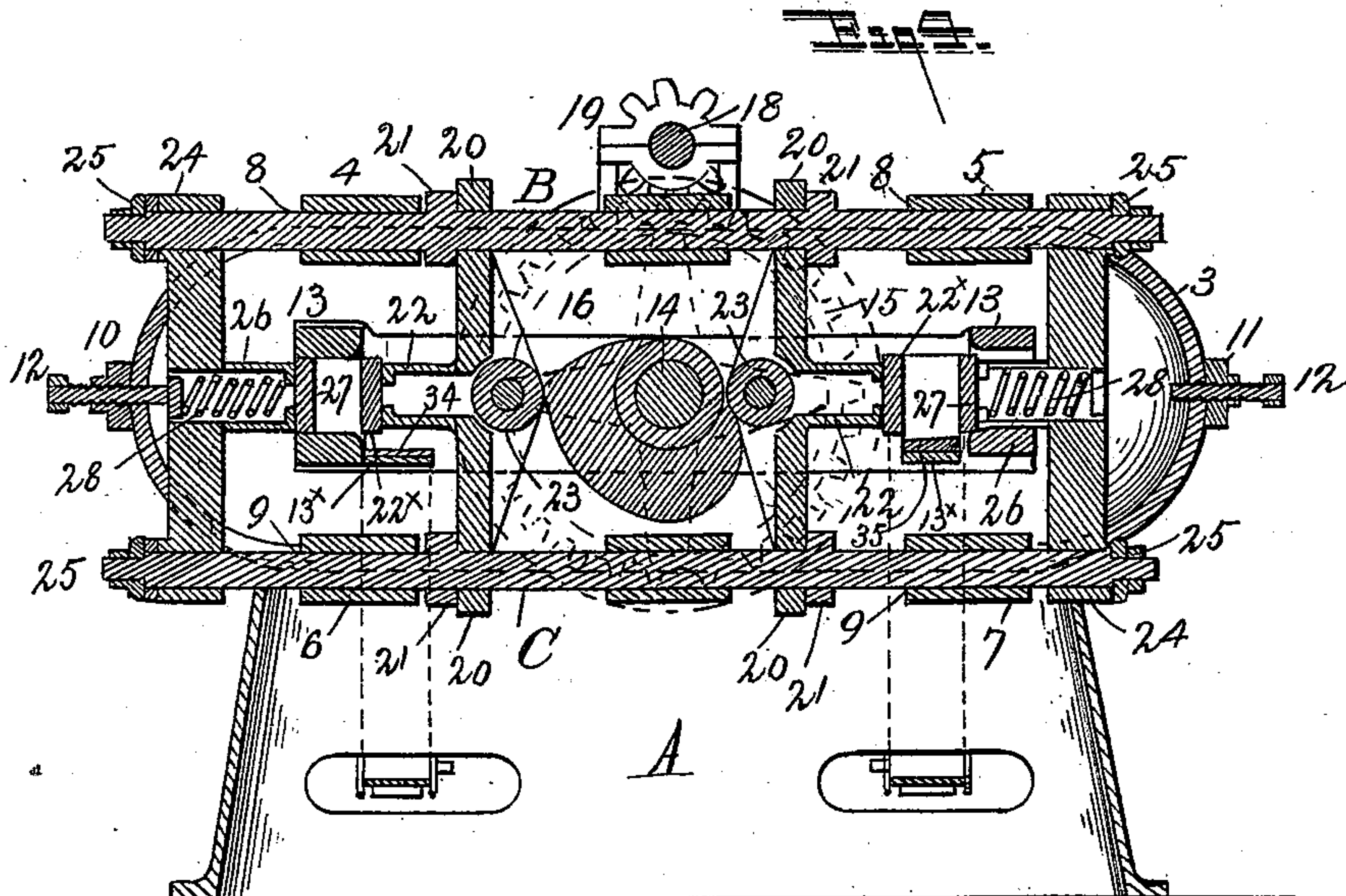
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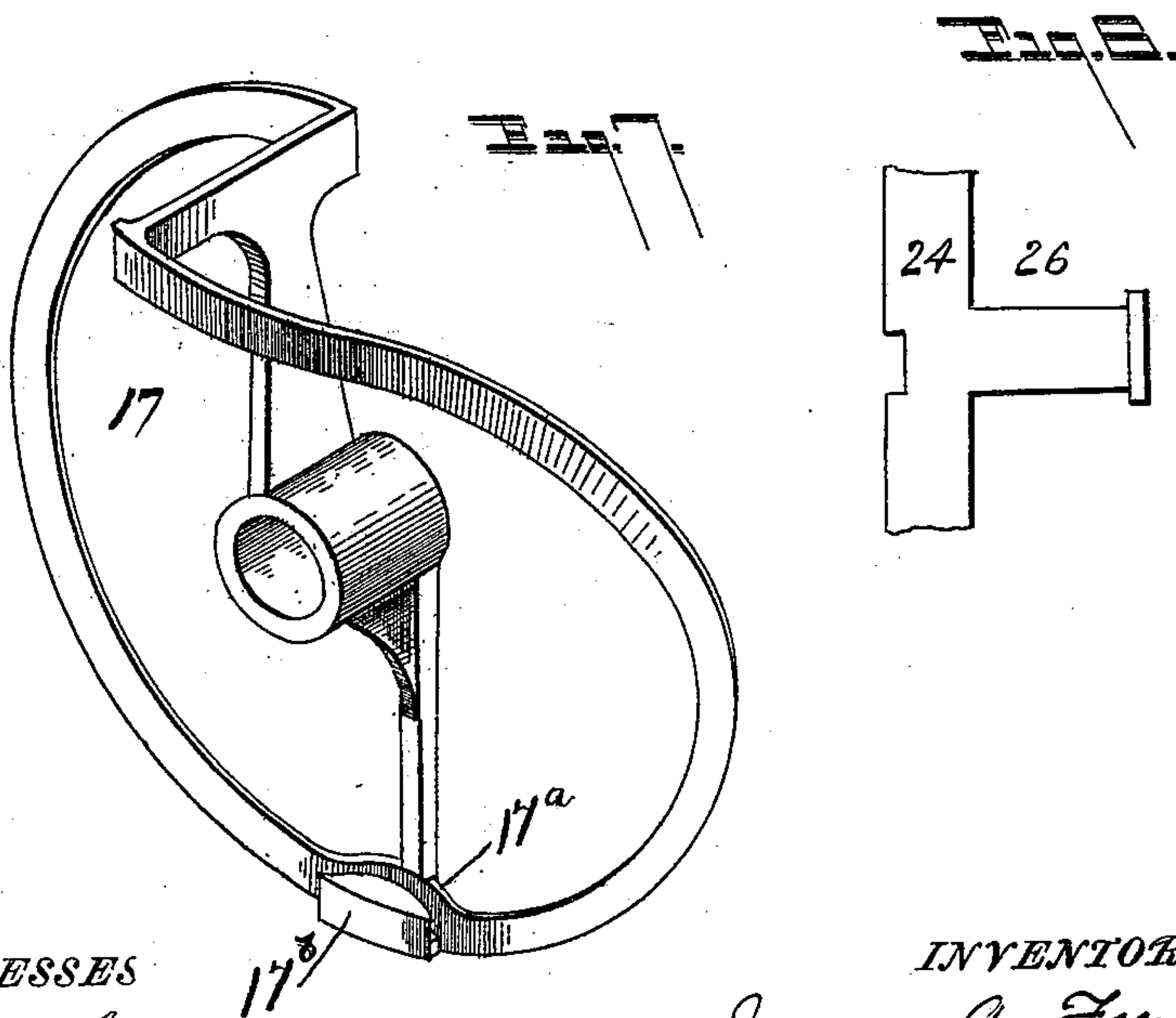
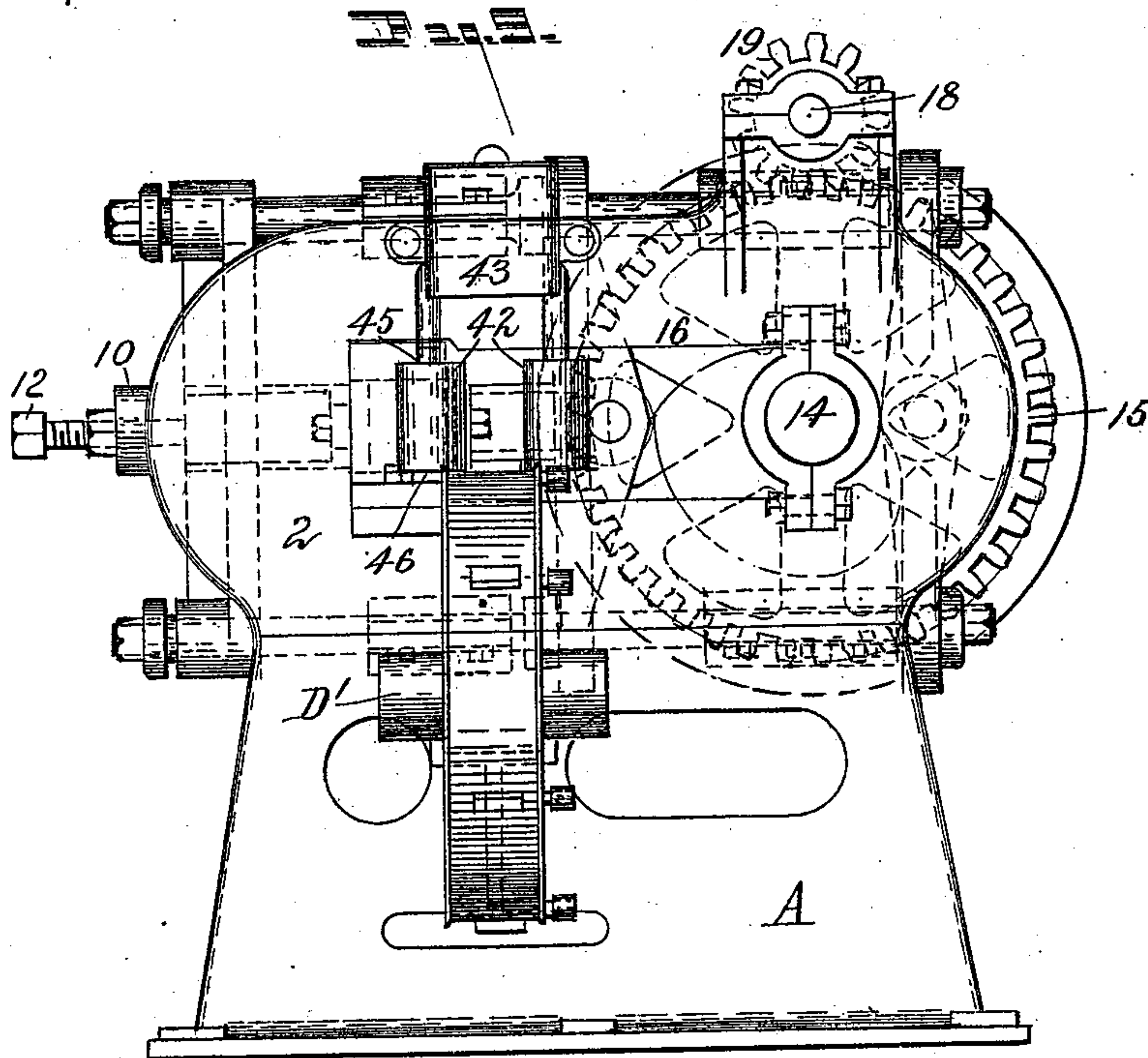
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4 Sheets—Sheet 4.

J. A. FREY.
RE-PRESS BRICK MACHINE.

No. 541,528.

Patented June 25, 1895.



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UNITED STATES PATENT OFFICE.

JAMES ARTHUR FREY, OF WILLOUGHBY, OHIO.

RE-PRESS BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,528, dated June 25, 1895.

Application filed June 30, 1893. Renewed March 21, 1895. Serial No. 542,716. (No model.)

To all whom it may concern:

Be it known that I, JAMES ARTHUR FREY, a citizen of the United States of America, residing in Willoughby, in the county of Lake, in the State of Ohio, have invented a new and useful Re-Press Brick-Machine, of which the following is a specification.

My invention has relation to improvements in machines for re-pressing bricks after they have been cut, made, or formed from columns or slabs of clay and still remain in a sufficiently plastic condition to be further solidified and molded by additional compression and pressure.

I have fully and clearly illustrated my invention in the accompanying drawings, wherein—

Figure 1 is an end elevation of the machine. Fig. 2 is a plan view. Fig. 3 is a side view. Fig. 4 is a transverse vertical section through the middle of the machine, showing the dies, the plungers, and the re-press cam. Fig. 5 is a detail perspective of one of the dies or re-press boxes partly broken away to show one of the relief-tubes leading therefrom. Fig. 6 is a transverse section of the re-press box and the adjustable plate attached thereto to adjust the height of the carrying-belt to the floor of the box. Fig. 7 is a detail of the cam which moves the carrying-belts, showing the portion which carries the belt back a short distance while the re-pressing operation is being accomplished. Fig. 8 is a detail of a solid expelling-plunger. Fig. 9 is an end view of a single-acting machine.

A designates a substantial base or bed frame, consisting of any suitable metal construction adapted to maintain and support the mechanism. On top of this bed frame are mounted two strong plates 2, 3, standing on their bottom edges, and arranged parallel to each other, lengthwise with the bed and at right angles to the carrying-belts, as shown. The plates 2, 3, are bolted to the base and on and between them the operative mechanism is arranged and supported. The side plates 2, 3, are held in relative position by upper bridge-pieces 4, 5, and lower bridge-pieces 6, 7, near the respective ends of the side plates; the bridge-pieces being bolted to the side-plates, and formed into sleeves or boxes 8, 9, through which the guide-rods B, C, are pro-

jected and slide endwise. The ends of the side-plates have fastened to them cross-pieces 10, 11, central or intermediate of their vertical depth or height. These end cross-pieces constitute ties for the ends of the side-plates; and also abutting pieces for the plungers, which repel or discharge the forms from the repress-dies after being repressed. In the middle of each of the end cross-pieces 10, 11, is an adjusting screw 12, which adjusts the resistance and position of the expelling plungers, as hereinafter fully set forth. Near the respective ends of the frame are mounted the repress-boxes or dies 13, the flanges at the ends of the dies being bolted to the flanges of the frame. These dies 13, consist of strong metal boxes having interior conformations adapted to take the forms subjected to them, and having open sides and closed ends. The opening is arranged in alignment or range of the respective and opposite plungers, with the bottom on a line with the upper surface of the carrying-belts. In bearings in the side-plates is journaled the shaft 14, which carries the gear-wheel 15, and thereon, between the side-plates, the pressure-cam 16, and on the extended end of the shaft, is the propelling cam 17, the tread of which operates the carrying-belts. The tread of the propelling-cam at a determined point, as at 17^a, is deflected and opposite thereto is arranged and secured a flanged-piece 17^b, the race thus formed serving to engage the lugs of the carrying-belts and carry the belt a short distance backward at the time a brick is discharged from the boxes onto the carrying-belts and thus avoid damage to the corners of the bricks. On top of the frame is journaled a shaft 18, carrying a pinion 19, meshing with the gear-wheel 15; the shaft 18, having a belt-pulley 18^a or other suitable means in communication with the power source. Not shown. The two guide bars or rods B, C, are supported in and slide in the sleeves 8, 9, and have fixed on them the vertically arranged plunger-pieces 20, sitting against the abutting collars 21 on the rods, as shown. The rods 8, 9, and the plunger-pieces 20, thus constitute a sliding-frame. In the center of each of the pieces 20, reaching in the direction of the repress-boxes, is an arm 22, in alignment with the opening in the repress-box, and on the back of each piece 20 is

journalled a roller 23, on which the pressure-cam treads. The projection or arm 22 constitutes the plunger, and carries on its ends a suitable plate 22^x, fitting in the repress-box. 5 The pressure cam, it will be seen, treads the rollers 23 alternately in its rotation, and reciprocates the sliding frame, and drives the plungers in the oppositely arranged repress-boxes alternately. This reciprocation of the 10 sliding-frame also operates the plungers which expel the repressed forms from the repress-boxes.

On the respective ends of the guide-rods B, C, are arranged two vertical plunger-bars 24, 15 loosely sleeved on the guide-bars by bearings or apertures through their ends; the flanged-nuts 25, on the ends of the guide bars serving as abutting means to draw the bars 24, inward, as indicated in the drawings. From the 20 vertical center of the bars 24, in alignment with the repress-boxes, is a hollow or deeply socketed projecting arm 26, at the end of which is a plate 27, constituting the expelling and abutting or resisting plunger operating 25 in the repress-box oppositely to the repress plunger. In the socket of the arms 26, is a spring 28, having one end sitting against the end of the socket and the other and outer end abutting against the inner end of the adjusting screws 12. The end plates 27 on the arms 30 26 reciprocate in the repress boxes and are not entirely withdrawn therefrom; while the plungers operating to compress and re-press the forms or bricks are entirely withdrawn 35 from the repress boxes and move across the carrying-belts. The resilient abutment made by the springs 28, may be replaced by a solid plug or plunger to fill the repress-box to suit different demands; as following:

40 For front bricks, or similar purposes, where it is essential that all the brick and forms shall be of uniform size, the solid plunger is used, and holes *a*, are bored in the side of the die provided with removable tubes *b*, which 45 can be readily replaced when worn too large by action of the clay, and the dies and boxes preserved. The surplus clay escapes through the tubes, and the bricks are thus all made of the same size or thickness. For paving 50 brick and similar purposes where slight variance of dimensions is not objectionable to the uses, the springs in the plungers are of much advantage, since they give a resiliency to the action of the machine with the result 55 that all the clay is retained in the block.

60 D, D', and E, E', designate four substantial brackets, two on each side of the frame, strongly bolted thereto, and carrying in their outer ends, shafts 28, 29, having mounted thereon pulleys 30, 31, 32, and 33, carrying 65 endless carrying belts 34, 35. These carrying-belts are preferably metal bands having fixed on them transversely disposed ribs or lugs 36, placed at determined distances on the bands and between which the blocks to be repressed are laid. The pulleys carrying the bands are

preferably made with recesses 37, in a flange 37^x on their perimeters, which engage lugs 38, on the under edge of the belts, to insure the regular movement of the belts and pulleys. 70 On the inner edge of the belts are secured laterally projecting lugs 39, of equal distance apart, and carrying small rollers to lessen friction; these roller-lugs 39, being engaged by the tread of the propelling-cam which thus 75 pushes the belts along. The belts 34, 35, pass over guide-plates 40, in front of the repress-boxes and over angle-plates 41, where the propelling cam engages the roller-lugs, so that the belts are not forced out of line by the 80 plungers, or by the cam.

To prevent the clay from adhering to the plungers, it is essential to supply the forms with a lubricant, and this I accomplish by placing a pair of vertical cloth-covered roll- 85 ers 42, adjacent to and in front of the repress boxes, and above the carrying belts, between which rollers the forms pass on their way to the repress operation. Above each set of the rollers 42, is an oil vessel 43, secured to the 90 frame, and provided with faucets 44, through which the flow of oil is regulated. The oil drops on the upper ends of the rollers and finds its way to the cloth through which it exudes to the bricks. The rollers have their 95 bearings in pivoted arms 45, 46, so that they may be directed inward over the belt, and to do this and make the rollers bear against the forms, I connect two of the pivoted arms by a spring 47, as shown. 100

In front of the re-press boxes 13 are secured adjustable plates 13^x, arranged to bear with their upper faces against the carrying-belts, so that by raising or lowering the plate the 105 uppersurface of the belt may be brought even with, and carried in alignment with, the bottom of the dies; and so that in changing the dies for different sizes of bricks or forms, the height of the pulleys of the carrying-belts need not be changed. Changing the height 110 of the belt at the dies, necessarily affects the tension of the belt, which is accommodated and regulated by the use of sliding-boxes *a*^x, to support the pulleys of the carrying-belts; set-screws *b*^x, being provided to adjust the 115 boxes, as shown in the drawings.

The foregoing description applies generally to a double acting machine, or a machine carrying two belts; but my invention is equally applicable to a machine carrying but a single 120 carrying-belt. This single carrier adaptation is effected by leaving off one repress box and the carrying mechanism associated therewith, and one of the end cross-pieces, and mounting one of the cam-bearing rollers on the vertical 125 end-bars, and shortening up the frame as shown in Fig. 9 of the drawings.

The gearings on the double acting machine need not be increased in weight and strength, as the power applied to do the re-pressing is 130 used alternately in opposite points. In other machines where two repress boxes side by

side are used, the power must be increased and the weight of the machine and its gearing also be made greater.

The advantages of this improved mechanism are: that the construction is simple and efficient and the pressure of the cam is direct against the compressing-plungers one at a time, or in alternation; in the means for operating the endless belts, which can be made of any length desired, and less care is required in placing the bricks than in those machines having reciprocating carriages. The increase in capacity is material. The repressing the bricks while standing on the edge instead of lying flat, greatly facilitates the handling of the bricks, because the hand can grasp them much more conveniently edgewise than when lying flat.

The operation may be stated as follows:—

1. The pressure cam having been set in motion through the agency of the gearings in connection with the source of power, and the carrying-belts being supplied with bricks, the propelling-cam engages the roller-lugs on the carrying-belts and moves them so as to bring the bricks, laid on the edges thereon, in front of the open repress boxes, when the pressure cam acts to force the plunger across the belts and move the bricks from the same into the repress-boxes, until they encounter the back plates in the repress-boxes, and as the pressure-cam revolves, it causes the plunger engaged to compress the brick. At the same time the propelling-cam engages the lug on the belt adjacent to the dies with its reversing-tread, drawing the carrying-belt a short distance back, moving the lug on the face of the belt at the front of the repress-box back free from the box, to avoid damaging the corner of the brick when expelled and discharged from the box on to the carrying-belt. When the repress-cam rotates to engage the other plunger, the sliding-frame is moved in that direction, which brings the expelling-plunger at the other end of the machine into action to push the repressed brick out of the repress-box on the carrying-belt, when the propelling-cam moves the belt forward carrying the brick thereon ready to be lifted from the belt.

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

1. The combination of a horizontal open-end repress-box, a brick carrying-belt to bring the bricks to the mouth of the repress-box, a reciprocating-plunger moving across the belt to push the brick off the belt and into the repress-box, a resistance plunger in the repress-box, and means to reciprocate the plungers.

2. The combination of an endless rotative carrying belt, provided with lugs on its edge at determined distances, a repress box having open sides and mounted with its bottom on a line with the carrying belt, a plunger to move

across the belt into the repress-box, a plunger opposite to the repress-plunger to expel the brick, a single cam to operate both plungers, and a cam to engage the lugs on the carrying belt, and draw it forward.

3. The combination with the supporting frame, of a horizontal, reciprocable, frame mounted therein, a horizontal repress-box, having open sides, oppositely arranged and horizontally disposed plungers to oppositely engage a brick in the repress-box, a movable brick support in front of the repress-box, a cam to reciprocate the frame and operate the plungers.

4. The combination of a support, oppositely arranged and horizontally disposed repress-boxes mounted on the support, a sliding frame in the support, oppositely arranged repress-plungers on the sliding frame, oppositely arranged expelling plungers, at the ends of the sliding frame, a cam to slide the frame and alternately force the repress plungers into the boxes, and draw the frame back and move the expelling plungers through the boxes, carrying belts to carry the bricks to the repress-boxes, and means to move the carrying belts with the bricks in front of the plungers and repress boxes as specified.

5. The combination with the repress-boxes and the carrying belts, of vertically arranged lubricating rollers journaled adjacent to and in front of the repress-boxes, whereby the bricks on their way to the boxes are lubricated.

6. The repress-box herein-described consisting of the rectangular box having open sides, apertures in the ends of the box, and detachable tubes in the apertures as specified.

7. The combination with a sliding-frame, the repress plunger thereon, a cam to slide the frame and move the plunger, the repress box, the sliding end piece on the sliding-frame having the socketed expelling plunger projected therefrom, a spring in the socket of the plunger, and an adjusting and abutting screw to regulate the tension of the spring, as and for the purpose specified.

8. The combination with the repress-box and the oppositely reciprocating repress and expelling-plungers, of a carrying-belt mounted to travel with its carrying-surface on a level with the floor of the repress box.

9. The combination with the repress-box and the carrying-belt, of a belt-support secured in alignment with the bottom-floor of the repress-box and projected under the carrying-belt, as and for the purpose specified.

In witness whereof I have hereto set my hand in the presence of two attesting witnesses.

JAMES ARTHUR FREY.

Attest:

SAMUEL BURGERT,
F. P. KIBLER.