No. 755,242. PATENTED MAR. 22, 1904.

W. A. READ.

APPARATUS FOR THE MANUFACTURE OF METAL CANISTERS.

APPLICATION FILED FEB. 17, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 4.

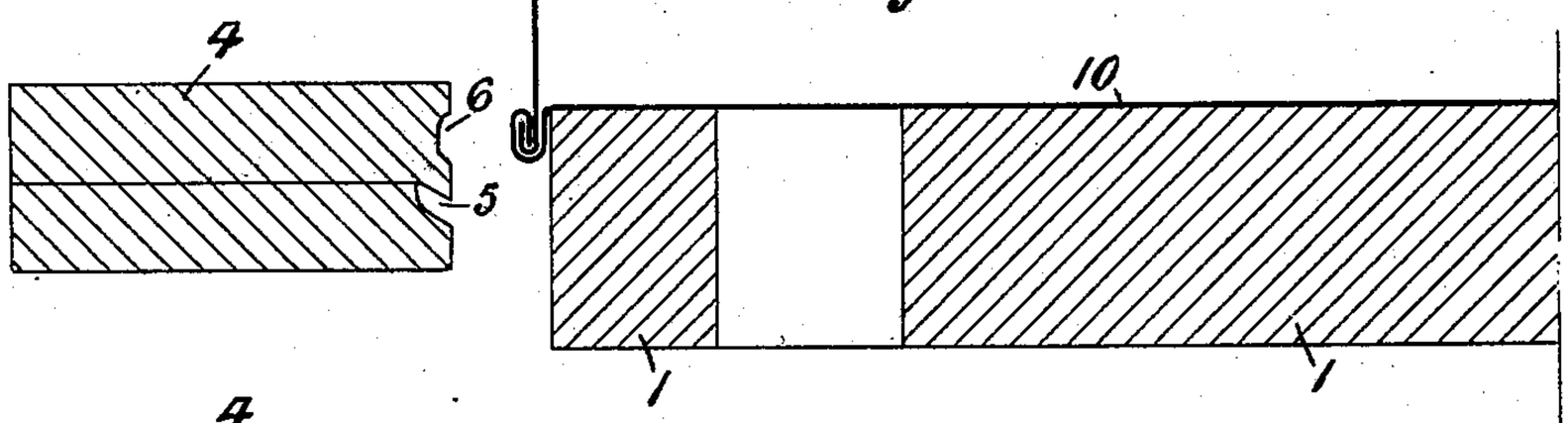

Fig. 3.

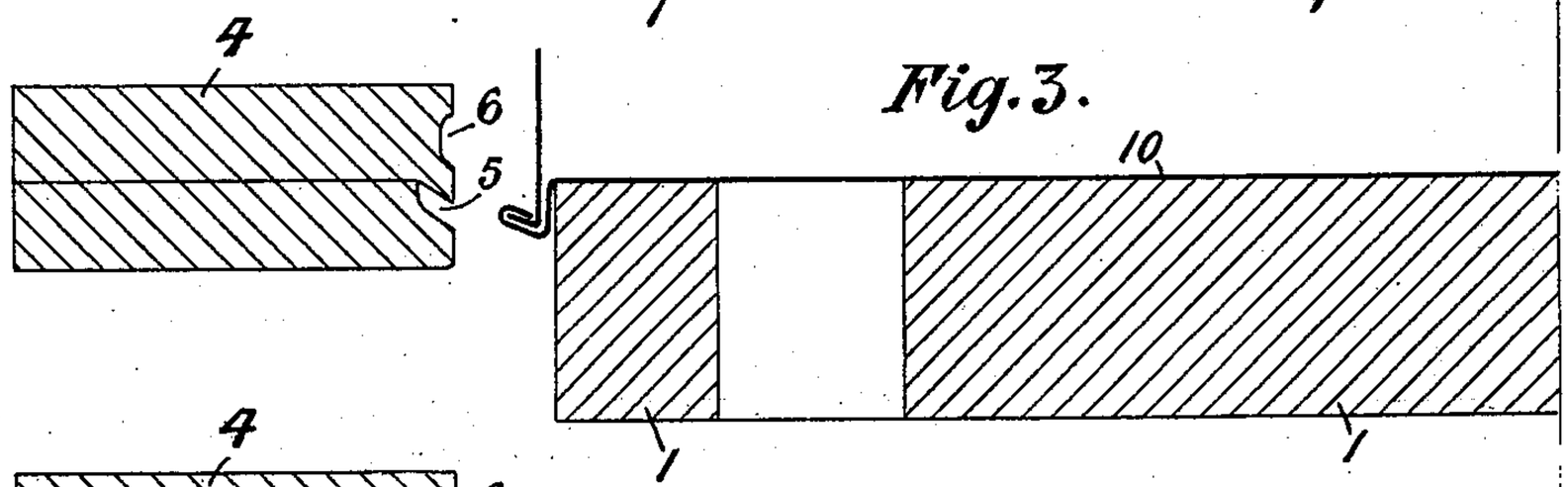

Fig. 2.

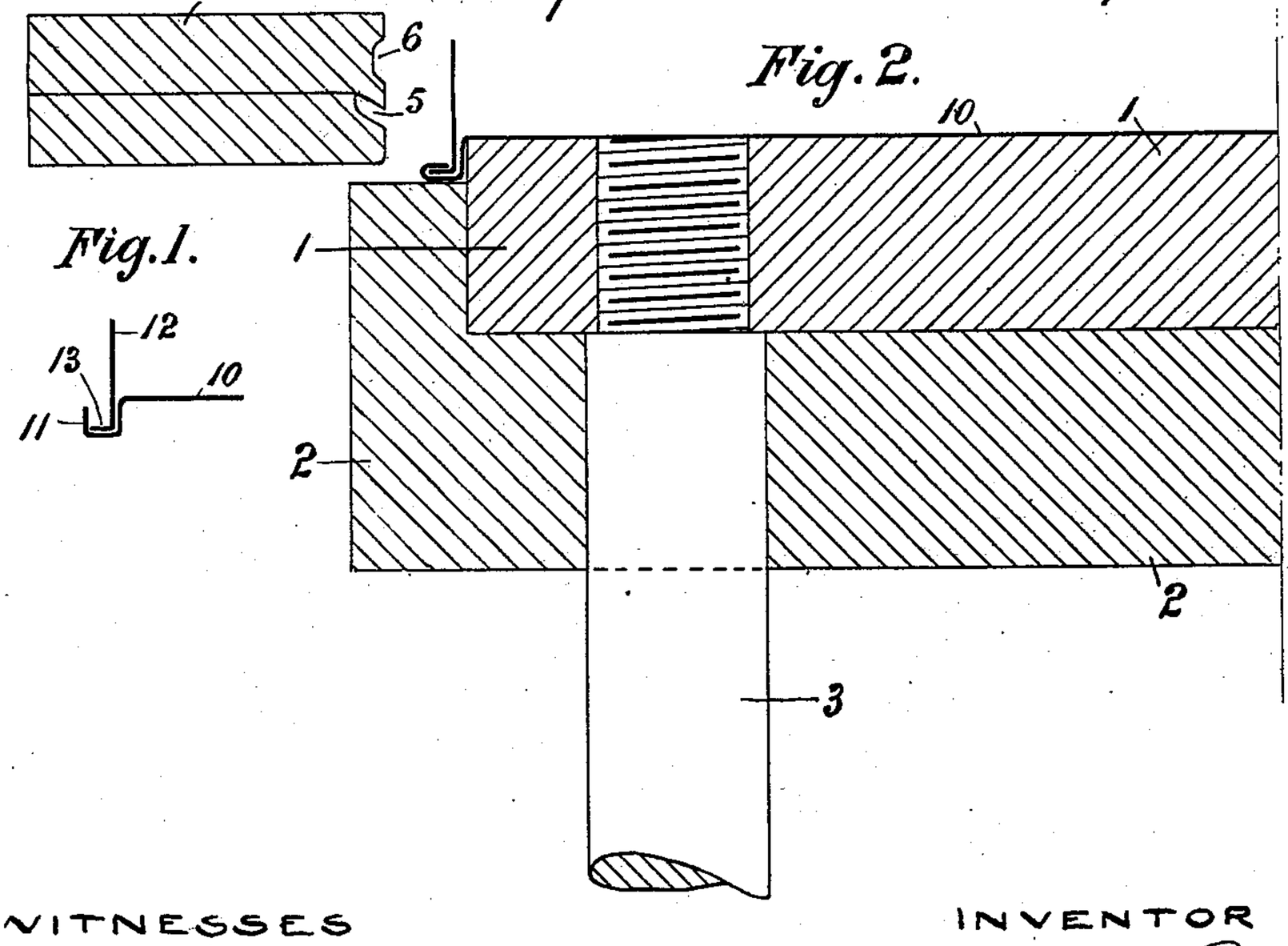

Fig. 1.

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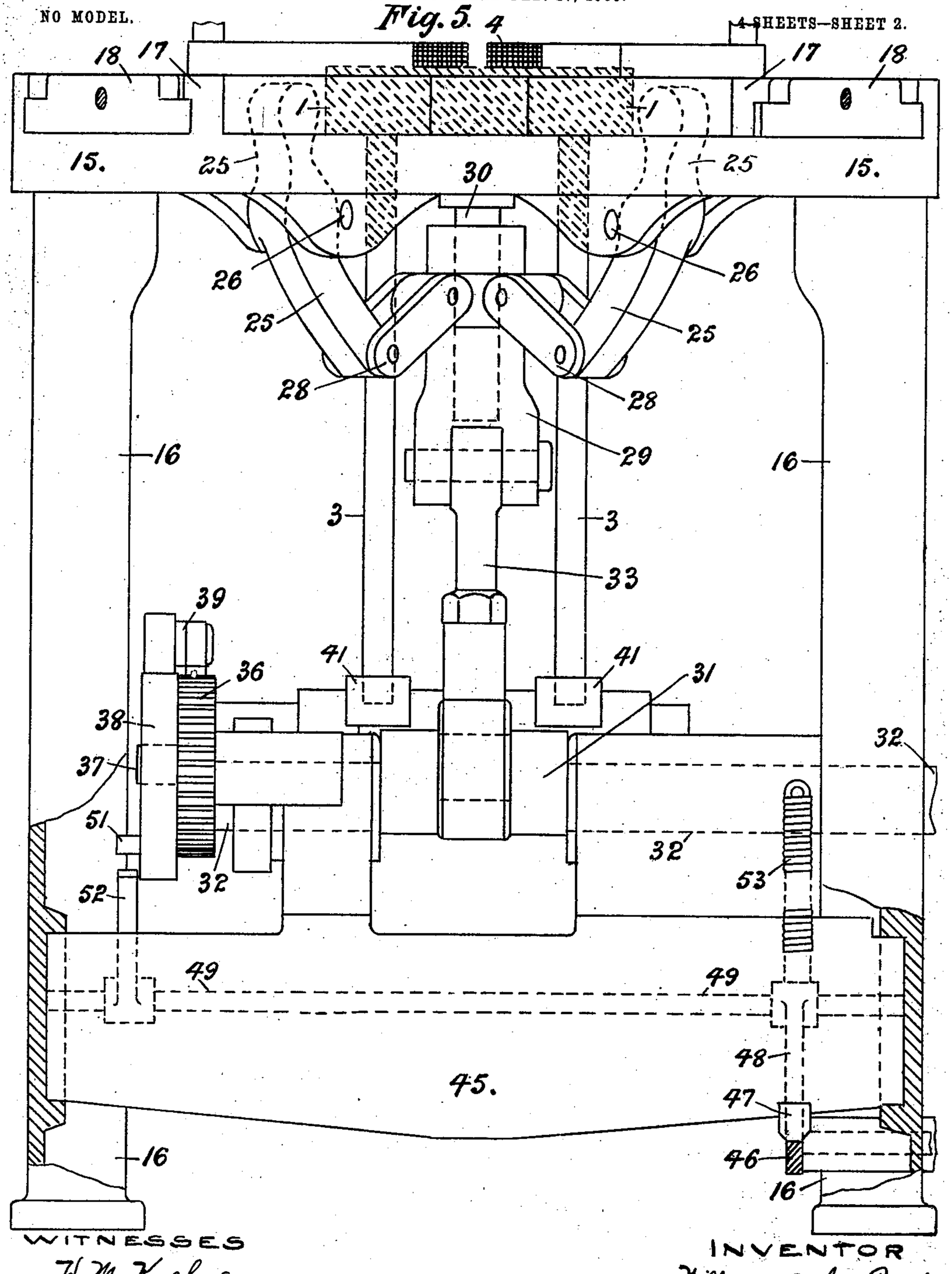
Fig. 5.



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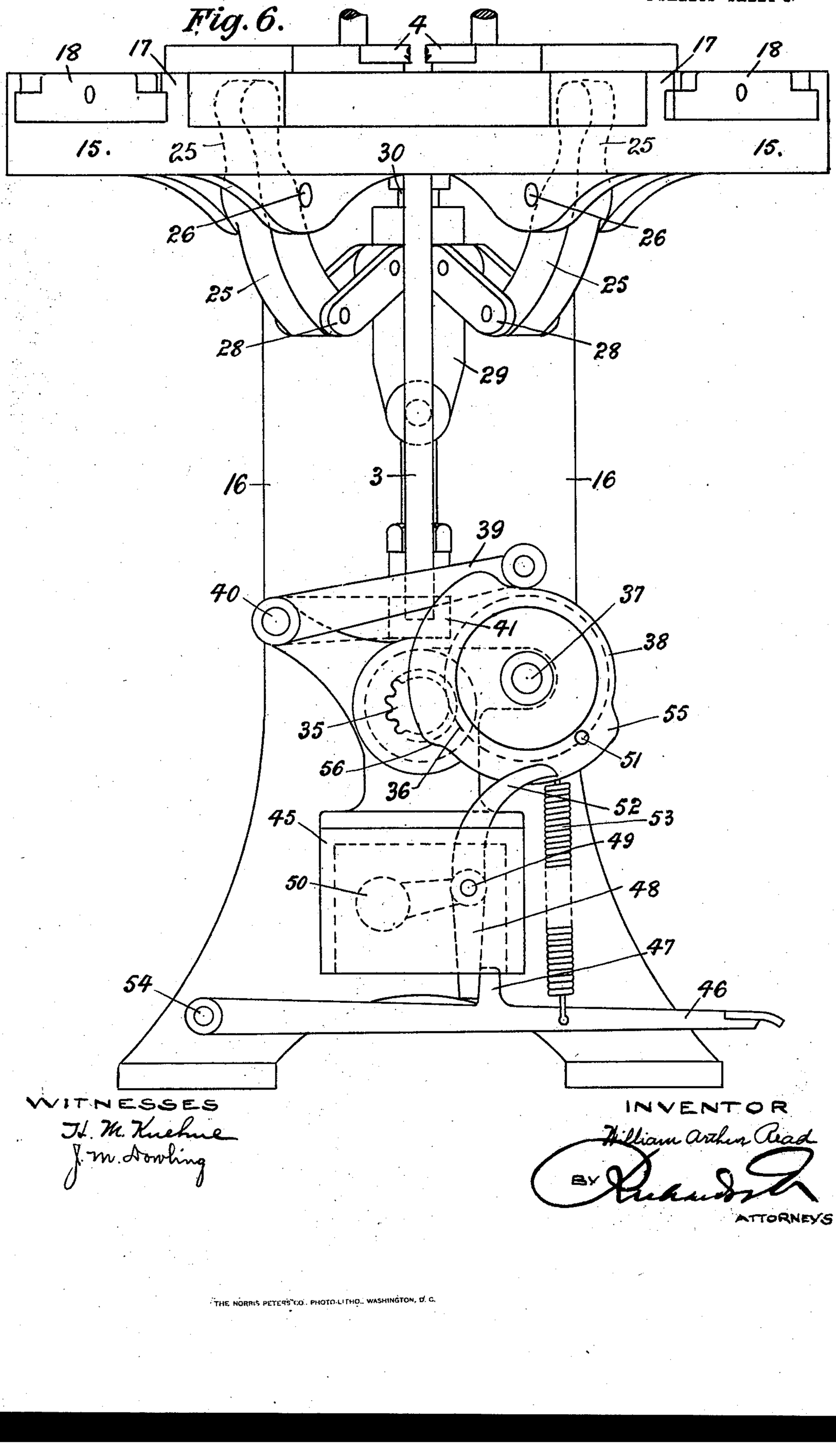
NO MODEL. 4 SHEETS—SHEET 3.

Fig. 6.



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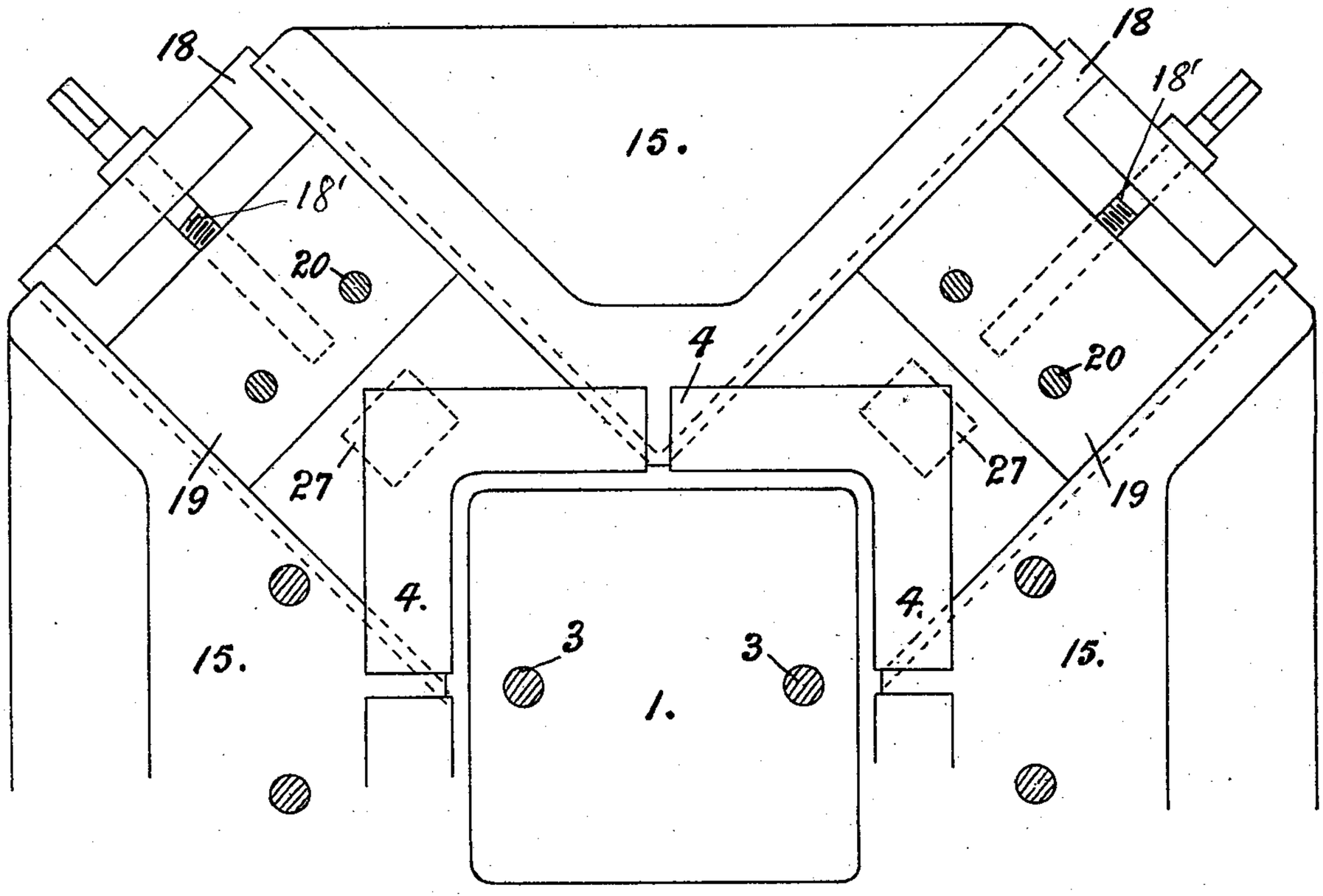
NO MODEL. 4 SHEETS—SHEET 4.

Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM ARTHUR READ, OF LIVERPOOL, ENGLAND.

APPARATUS FOR THE MANUFACTURE OF METAL CANISTERS.

SPECIFICATION forming part of Letters Patent No. 755,242, dated March 22, 1904.

Application filed February 17, 1903. Serial No. 143,862. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ARTHUR READ, engineer, a subject of the King of England, and a resident of Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in Apparatus for the Manufacture of Metal Canisters, of which the following is a specification.

This invention has reference mainly to the manufacture of thin or sheet metal canisters or boxes which are rectangular or polygonal in general form, but is also applicable to other forms of canisters or boxes, and it concerns more particularly the joining of the bottom or top, or both, or ends of such canisters to the body where such joint is a double-seamed joint. Further, the kind of machinery concerned is that known as the "squeezing" type—that is, machines wherein the seaming-tools move up to and recede from each corner of the canister and each tool seams the edges of the canister-body and the bottom, top, or end, as the case may be, at the corners and along half of each side of the canister from the angle-corners in each direction. Prior to being operated upon according to this invention the edge of the bottom, top, or end is formed with a rectangular annular groove or channel, and the body has formed upon it a right-angle flange. The parts being then placed together in position are operated upon by a succession of operations by "squeezing-tools" in a machine of the kind referred to. The first operation is to bend the upwardly-projecting edge of the bottom or end over the horizontal flange of the body by the lower ends of the squeezers or pressing-tools, the lower edge of the tools acting upon it at a level slightly above the said body-flange, the second is to press the folded joint up into an inclined position by a second action of the squeezers or tools—namely, by forcing the joint into an inclined groove in the tool-faces—and the third is to press the inclined joint flat against the body by a third and similar action of the squeezers or presser-tools. For effecting the upward inclining of the joint in the second operation the pressing-tools are provided with an upwardly-inclined gap in their edges, which receive the joint, and for the third operation the operative edge of the tools is provided with a groove which preferably will correspond in form with the shape of the seam outside.

The invention will be further described with the aid of the accompanying drawings, which illustrate the manner of effecting this seaming and a complete machine.

The machine in general form is of a well-known type.

In the drawings, Figure 1 shows the stage of manufacture and the form of the edges of the joints of the canister to be seamed prior to the seaming and in which they would be placed in the machine. Fig. 2 shows the block on which the canister rests, its bed or guide plate, and a part of one of the pressing-tools which are carried on the sliding supports. It also shows the seam or joint after the first operation. Fig. 3 shows the supporting block and tool in the position in which the seam is bent up and the seam in this bent-up position. Fig. 4 shows the supporting block and tool in the position in which the final squeezing action is performed and the joint in its finished state. Fig. 5 is a front elevation, Fig. 6 an end elevation, and Fig. 7 a part plan of the machine.

Referring in the first instance more particularly to Figs. 1 to 4, the canister-supporting block 1 works in a bed or guide plate 2, in which it rests during the first operation. This plate is fixed on the table of the machine. 3 represents rods connecting the supporting-block 1 with its raising and lowering levers at the lower part of the machine. 4 represents the pressing tools or jaws carried by the reciprocating slides, as herein described.

Referring to Fig. 1, 10 represents the bottom, top, or end of the canister which rests on the top of the rising and falling block 1, and 11 is the upwardly-projecting flange or edge of the bottom which forms the outside part of the annular channel, the lower part of which rests on the upper edge of the plate 2. 12 represents the side or body of the canister, and 13 its horizontal flange.

The position of parts shown in Fig. 2 rep-

resents that in which they stand in relation to one another horizontally during the first operation. In this position when the tools 4 move inward their lower face angles strike the vertical flange 11 of the bottom, top, or end, as the case may be, just above the level of the flange 13, and as they pass over it their under side presses it, flange 13, down flat, as shown, the upper edge of the plate 2 serving as a support to the annular channel of the bottom or top 10. The operative lower corner of the tools 4 is slightly rounded, and the tools are in two parts, an upper and lower part, at the level of the inclined groove which effects the second operation, as shown. When the tools 4 have receded from the canister after the first operation, the supporting-block 1 is moved up into the position shown in Fig. 3 by the machine (and this automatically, as hereinafter described)—that is, with the then horizontal seamed joint of the canister opposite the mouth of the deep inclined groove 5 of the tools—and the tools are again moved up to the canister, and as the lower inclined surface of the grooves 5 of the tools presses on the folded joint of the canister they tilt it upward at the angle of the groove. In the return stroke of the tools the joint can come out of the grooves, although their upper surface will press on the upper surface of the joint in coming out, as the elasticity or spring of the metal of the canister will permit of this, and the inclination is not steep. This completes the second operation. For the third operation the supporting-block 1 is raised again so that it and the tools stand in the relative horizontal position shown in Fig. 4. In this position the upper groove 6 of the tools will be in the same horizontal plane as the then upwardly-inclined outer edge of the joint, and when the tools press upon it in their inward stroke they bend it up vertically, and the metal forming the groove 6 presses the seam or joint flat against the canister-body, as shown in Fig. 4.

Referring now to the machine generally, 15 is the table of the machine, and 16 its supporting-frames.

17 represents the guides on the table 15, in which the slides 18, which support and move the pressing tools or jaws 4, work, these tools being carried on secondary slides 19, adjustable on the main slides 18 by means of a screw 18′, to which they are fastened by screws 20. The slides 18 are operated by levers 25, hinged at 26, to the under side of the table and having their upper ends placed in a slot or aperture in the slides 18, as shown at 27 in Fig. 7, and their lower ends connected by links 28 to a cross-head 29, sliding on the pin 30 and operated from the crank 31 of the main operating-shaft 32 of the machine, by an adjustable connecting-rod 33. As this shaft revolves, the levers 25 will be vibrated, and so the slides and tools will be moved in and out. The machine is adapted and constructed to cause the tools to be moved in and out three times in a complete cycle of operations—namely, once while the parts are in a position shown in Fig. 2, once while they are in the position shown in Fig. 3, and once while they are in the position shown in Fig. 4—and during these three actions the canister-supporting block 1 receives successive movements upward. These successive upward movements are also effected from the main shaft 32 by a pinion 35 on it, working a spur-wheel 36 three times its diameter on a secondary shaft 37, upon which also is fixed a cam 38, having three different operative parts on its periphery. This cam actuates a lever 39, fixed on a shaft 40, and the two levers 41, also fixed on this shaft, which support at their outer ends the lower ends of the two rods 3, which carry the block 1. These shafts and parts are carried by bearings on the hollow cross-beam 45, extending between the two frames 16, and the shaft 32 may be driven by a belt-wheel having a clutch of any well-known type used on sheet-metal presses for constant stopping and starting between the wheel and the shaft.

In the present case the machine would be started by pressing a foot-lever 46 down, which would cause connection between the said belt-wheel and the shaft 32 to be made and the machine to be started. When this lever is pressed down, the arm 48, mounted on a shaft 49 in the cross-beam 45, will be moved by the weight 50 on this shaft to a position just above the projection 47 on the lever 46, and so this lever would be held down and the shaft 32 would continue to revolve until a pin 51 on the face of the cam 38 strikes the arm 52, fixed on the shaft 49, whereupon this shaft will be turned, so that the arm 48 is moved off the projection 47, and the spring 53 will pull up this lever 46 and will turn the shaft 54, on which it is fixed, which shaft operates the clutch mechanism of the driving-wheel and disconnects it and the machine stops. As the cam 38 makes only one revolution to three of the shaft 32, this shaft will make three revolutions after starting by the lever 46 before it is again stopped, and it will so operate the jaw-slides 18 three times.

With regard to the form of the cam 38, this cam on its periphery has three portions of different radii. That of the smallest radius would be the part the roller on the end of the lever 39 rests on when the supporting-block 1 is in its lowest or first position. The first rise 55 will be that which by acting on the lever 39 raises the rods 3 and the block 1 to the second position shown in Fig. 3, and the second rise 56 is that which will raise these rods and blocks to the third and final position, (shown in Fig. 4,) and when the end of this

rise leaves the roller of lever 39 this lever falls again, so that the roller will run on the part of the cam having the least radius, which corresponds with the first position. (Shown in Fig. 2.)

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

1. In a squeezing-machine for joining the body and end or ends or top or bottom of canisters, horizontally-reciprocating slides with squeezing-tools, having in their operating vertical edges an inclined deep and narrow groove with parallel sides, adapted to receive and press and support both sides of the seamed edge of the canister, and tilt it upward; and a canister-carrier adapted to move up and down across the face of said tools, substantially as described.

2. A machine for joining the body and an end or ends or top or bottom of canisters by a double-seamed joint, comprising horizontal tool-supporting slides operated from a main driving-shaft, a cam adapted to revolve at less speed than said shaft, a canister-supporting part movable vertically, and operating means between said cam and said support, whereby said support is intermittently moved to successive horizontal positions, said cam having a plurality of parts of successively-increasing radius on its operative part; substantially as set forth.

3. In a machine for joining the body and an end or ends or top or bottom of canisters by a double-seamed joint, comprising horizontal tool-supporting slides operated from a main driving-shaft, a cam adapted to revolve at one-third the speed of said shaft, and having three parts of successively-increasing radius on its operative part; a canister-supporting part movable vertically; operating means between said cam and said support, whereby said support is intermittently moved to three successive horizontal positions; a foot-lever; a clutch mechanism between the main driving-shaft and a driving-wheel, operated by said foot-lever; and a detent mechanism adapted to be released by the cam-shaft in its revolution, whereby said clutch is automatically operated and the machine stopped; substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILLIAM ARTHUR READ.

Witnesses:
S. GOODALL,
JOHN H. WALKER.