

No. 693,804.

Patented Feb. 18, 1902.

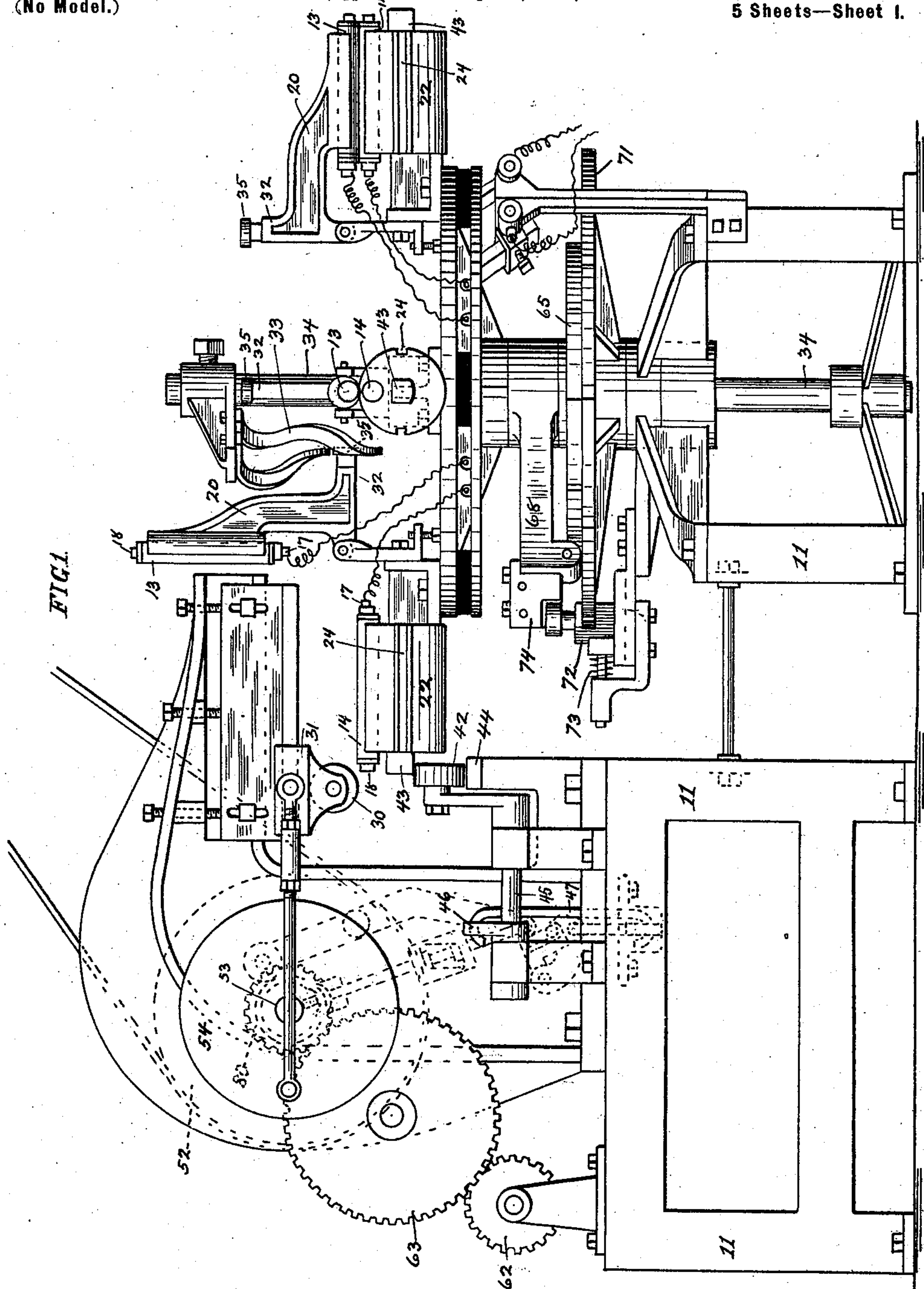
E. NORTON & A. P. KENNEDY.

MACHINE FOR AUTOMATICALLY SWEATING OR UNITING WITHOUT SOLDER THE
SIDE SEAMS OF SHEET METAL CAN BODIES.

(Application filed Sept. 10, 1900.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

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H. M. Munday

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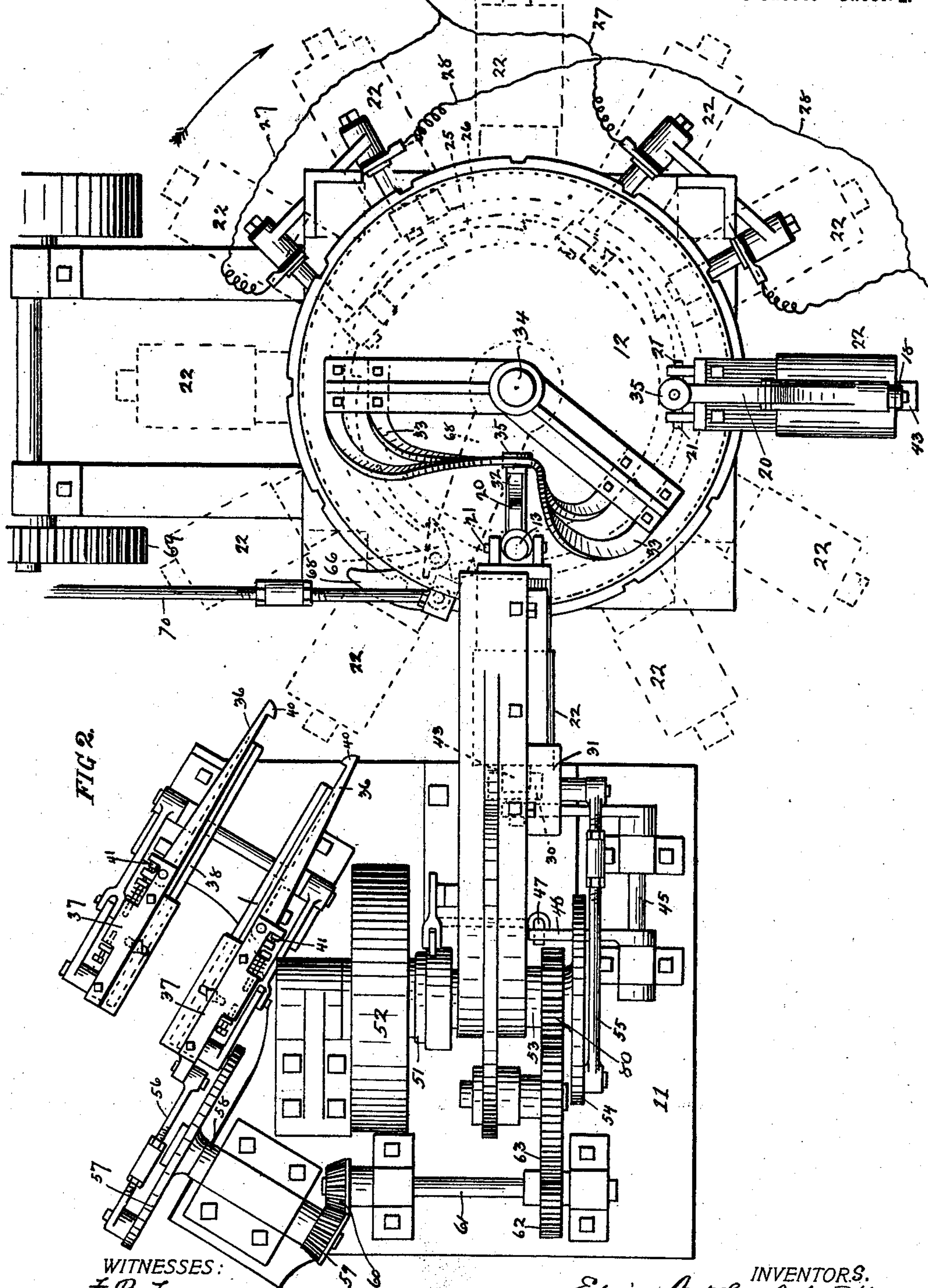
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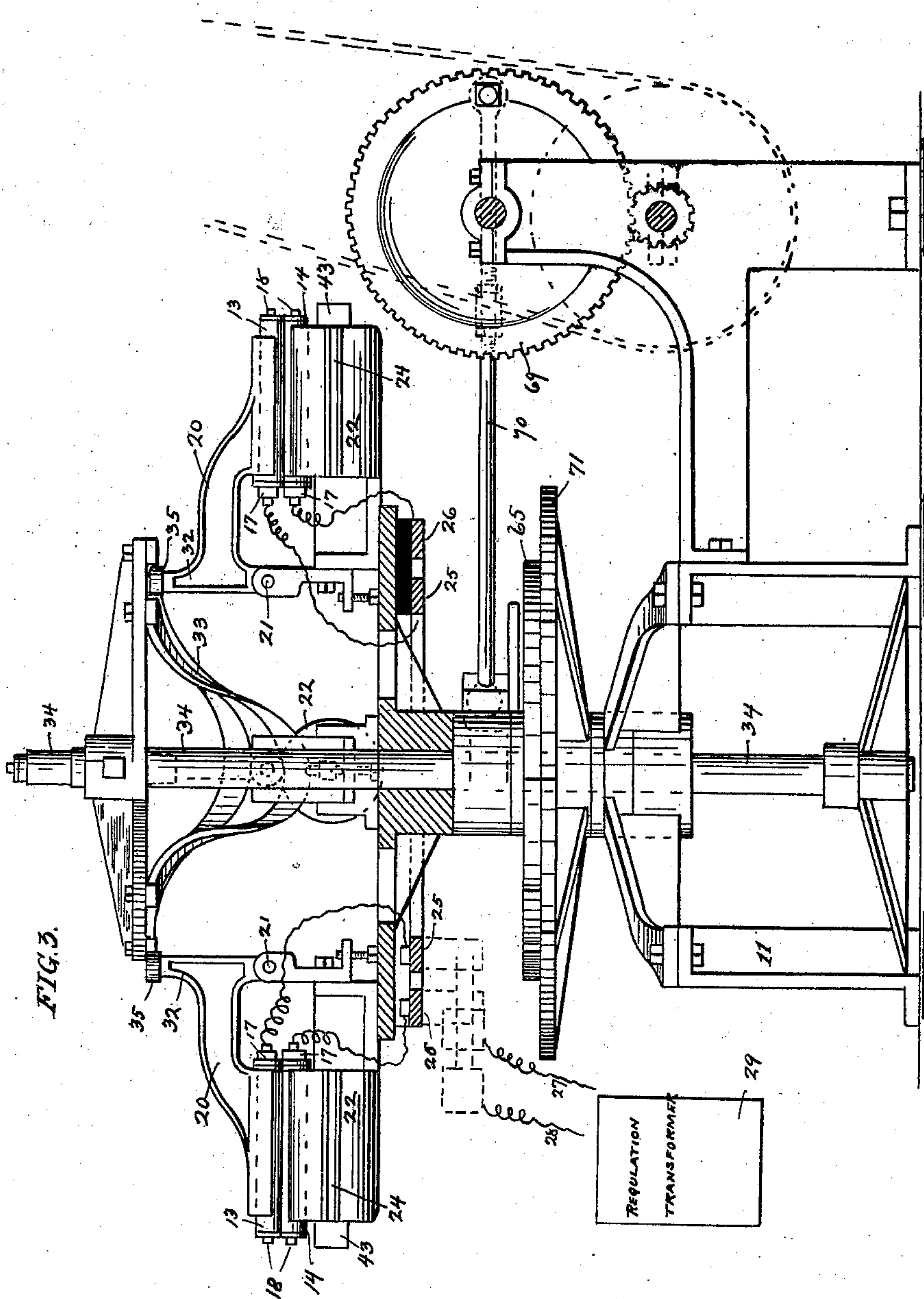
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5 Sheets—Sheet 3.



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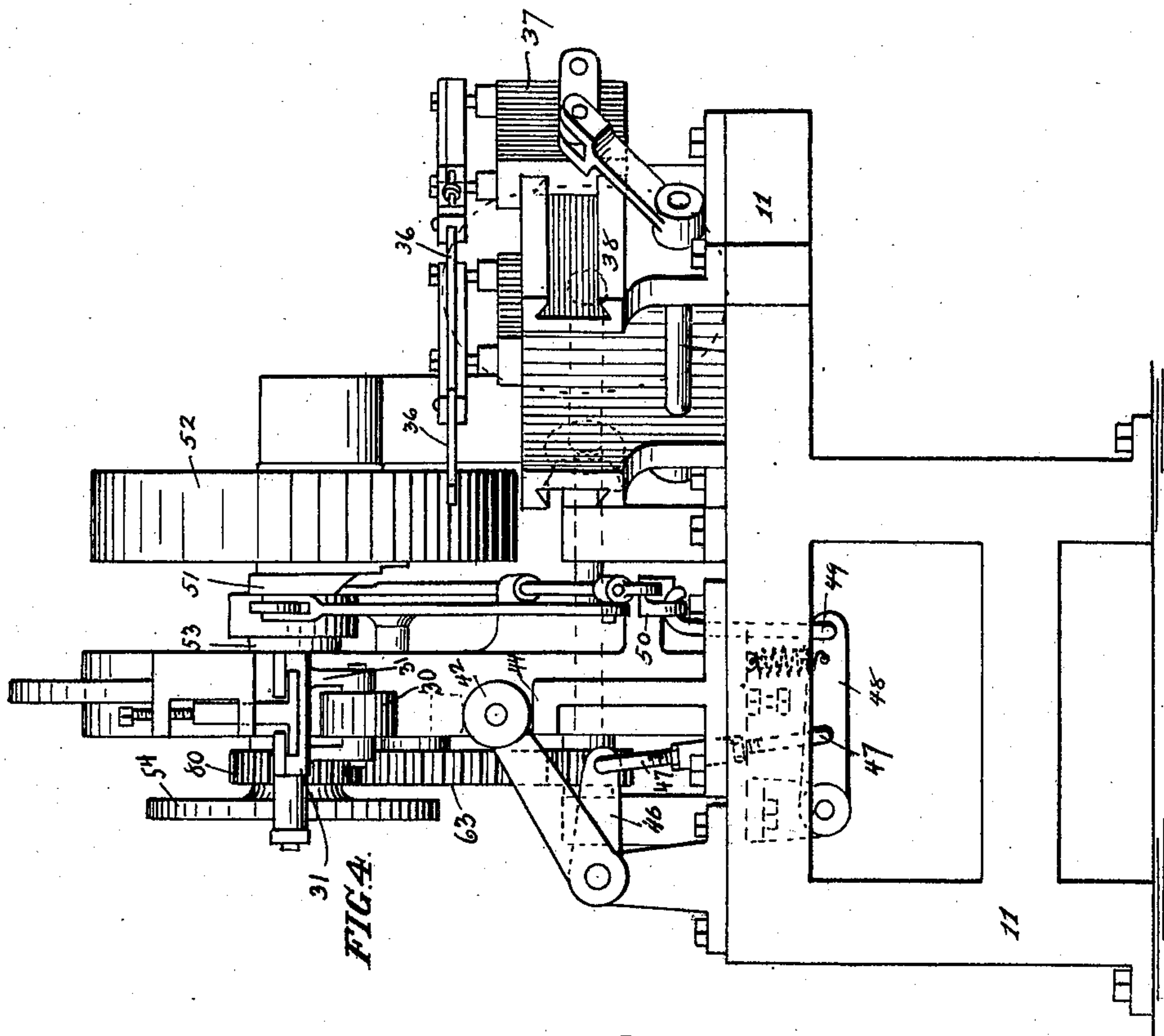
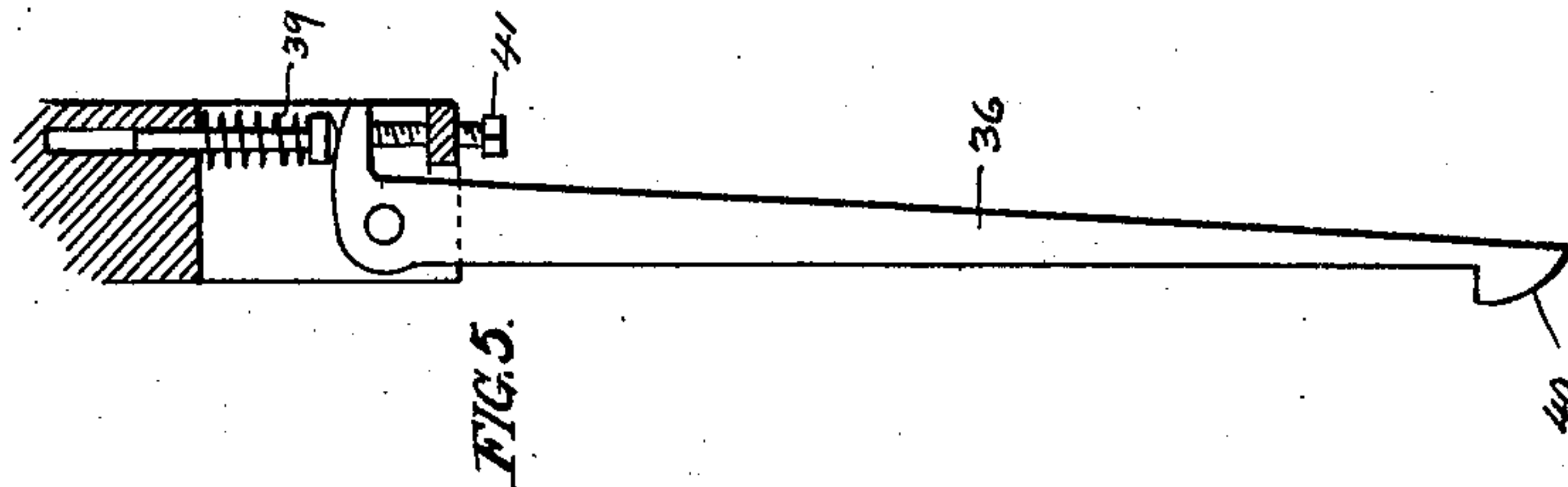
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(No Model.)

5 Sheets—Sheet 4.



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E. NORTON & A. P. KENNEDY.

MACHINE FOR AUTOMATICALLY SWEATING OR UNITING WITHOUT SOLDER THE
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5 Sheets—Sheet 5.

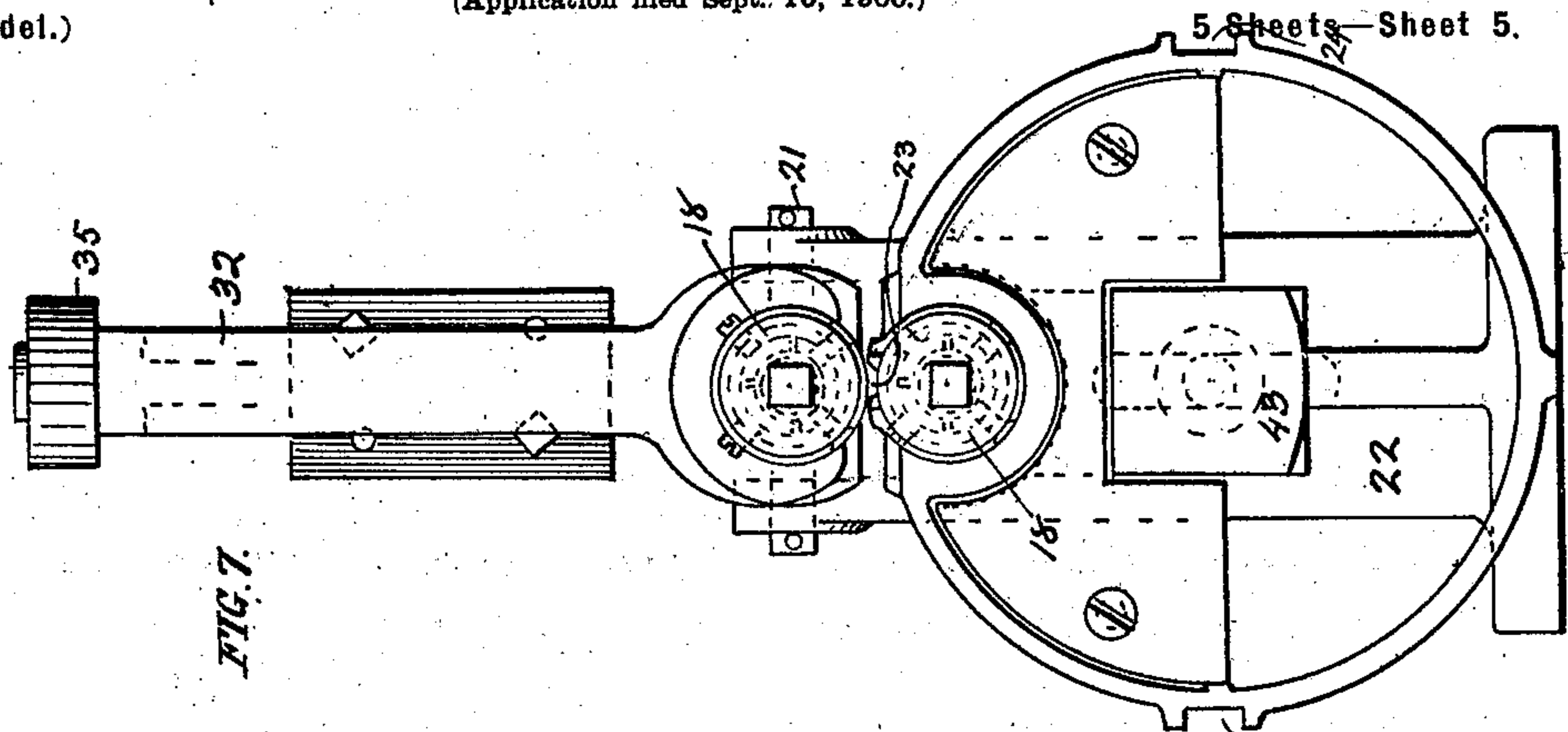


FIG. 7.

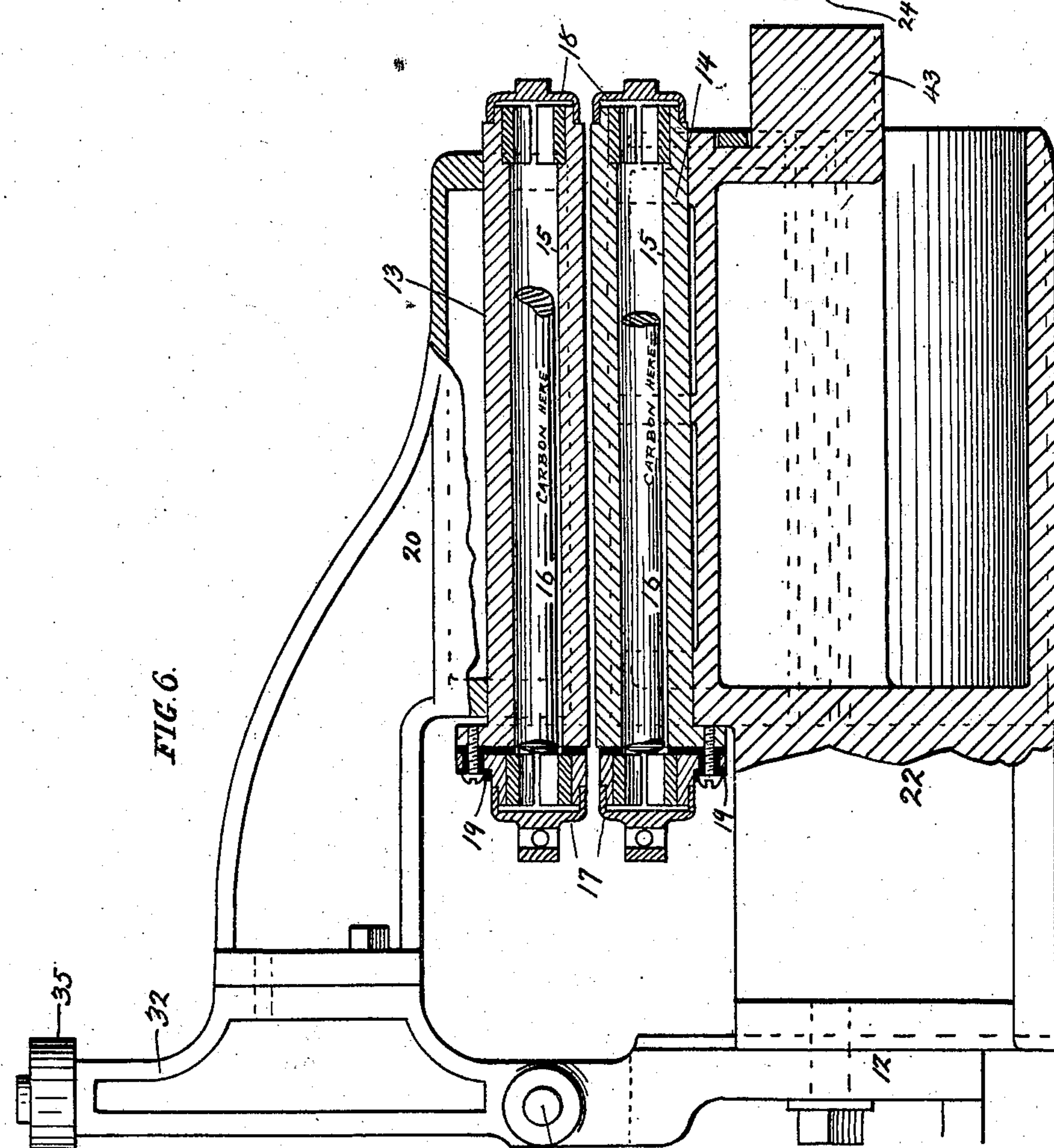


FIG. 6.

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UNITED STATES PATENT OFFICE.

EDWIN NORTON AND ARTHUR P. KENNEDY, OF MAYWOOD, ILLINOIS,
ASSIGNORS, BY MESNE ASSIGNMENTS, TO AMERICAN CAN COMPANY,
OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MACHINE FOR AUTOMATICALLY SWEATING OR UNITING WITHOUT SOLDER THE SIDE SEAMS OF
SHEET-METAL CAN-BODIES.

SPECIFICATION forming part of Letters Patent No. 693,804, dated February 18, 1902.

Application filed September 10, 1900. Serial No. 29,574. (No model.)

To all whom it may concern:

Be it known that we, EDWIN NORTON and ARTHUR P. KENNEDY, citizens of the United States, residing in Maywood, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Machines for Automatically Sweating or Uniting Without Solder the Side Seams of Sheet-Metal Can-Bodies, of which the following is a specification.

This invention relates to machines for soldering or uniting the seams of sheet-metal cans which have a tin or other soft-metal coating without the use of additional solder by simply fusing the tin or other soft-metal coating of the sheet metal.

It relates more particularly to improvements upon the machine forming the subject of the pending application of Edwin Norton, Serial No. 720,451, filed June 14, 1899.

The object of the present invention is to provide an automatic machine of a simple, efficient, and durable construction in which the seams of cans may be rapidly, cheaply, and perfectly soldered or united by such sweating or fusing operation and without the use of additional solder.

The machine embodying the invention comprises a series of heater-bars arranged in pairs, each furnished with an electric heater inside the same, a movable carrier or table upon which they are mounted, a series of vertically-swinging arms on the carrier, to which the upper heater-bars of each pair are secured, a cam, track, or device for automatically lifting the upper heater-bars in turn as the carrier travels around to permit the unsoldered can-bodies to be placed on the lower heater-bars and to permit the seam-compressing roller and the can-body ejector each to cooperate in turn with each of the lower heater-bars as the carrier moves around, a series of horns upon which the lower heater-bars are mounted and around or over which the can-bodies may be inserted, a pair of electric contact or collector rings on the carrier, with contact-brushes connected therewith for conducting the current to the electric heaters inside the heater-bars, a seam-compressing roller or

device cooperating in turn with each of the lower heater-bars, and a can-body ejector likewise cooperating in turn with each of the horns upon which the lower heater-bars are secured.

The invention consists in the novel construction of parts and devices and in the various novel combinations of parts and devices herein shown and described, and specified in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of a machine embodying the invention. Fig. 2 is a plan view; Fig. 3, a detail front view, partly in vertical section; Fig. 4, a detail front elevation with turret removed. Fig. 5 is a detail view, partly in section, showing one of the ejector fingers or jaws. Fig. 6 is a vertical longitudinal section through one pair of the heater-bars, and Fig. 7 a detail front view of one pair of the heater-bars and its supporting-arm and horn.

Similar figures of reference indicate like parts in all the figures of the drawings.

In the drawings, 11 represents the frame of the machine.

12 is the heater-bar carrier, the same consisting, preferably, of a rotary table having an intermittent or step-by-step movement.

13 14 are a series of pairs of heater-bars each having a hole or chamber 15, in which is an electric heater or carbon stick 16, secured in place by metal caps or clamps 17 18, one at each end of the carbon, each cap 17 being insulated from the heater-bar by insulation 19 and each cap 18 in electric connection therewith, so that the current must pass from end to end through each carbon, and thus heat the same. Each of the upper heater-bars 13 is secured to a vertically-swinging arm 20, hinged to the carrier 12 by a pivot-pin 21. Each of the upper heater-bar-carrying arms 20 is made heavy enough so that the weight thereof will serve to press the upper heater-bar against the lower heater-bar with the required force or pressure to properly embrace and heat the seam of the can-body inserted between the heater-bars while the carrier 12 moves around. Each of the lower heater-bars

14 is secured to a horn 22, over or around which the can-bodies may be placed and which are secured in a radial position on the carrier 12. Each of the lower heater-bars 14 is furnished with a longitudinal groove or channel 23 to receive the side seam of the can-body, and the supporting-horns 22 are each furnished with longitudinal grooves 24 24 to receive the hooks, fingers, or jaws of the ejector.

25 26 are the electric contact or collector rings on the rotating carrier 12, the electric heaters 16 in the upper heater-bars being all connected in multiple to the ring 25, and the heaters 16 in the lower heater-bars 14 being all connected in multiple to the ring 26. The rings 25 26 are connected by circuit-wires 27 28 with the regulating-transformer 29, through which the current is supplied to the electric heaters, so as to always heat and maintain the same at the required or proper degree of heat.

The seam-compressing roller 30 is mounted upon a reciprocating carriage or slide 31 and reciprocates forward over each of the lower heater-bars 14 in turn when it is brought around and stopped by the carrier 12 in front of said roller, thus compressing the parts or folds of the seam between itself and the lower heater-bar. At this time the vertically-swinging arm 20, carrying the corresponding upper heater-bar, is swung up out of the way into an upright position, as illustrated in Fig. 1, by the engagement of its bent arm 32 against the stationary curved track or cam 33, mounted on the central upright standard 34 of the frame. The bent arm 32 is preferably furnished with an antifriction-roller 35 to engage the cam. The curved track or cam 33 also holds said arm 20 elevated or out of the way at the next step or stop of the carrier and while the can-body ejector 36 reciprocates forward and back and strips or ejects the can from the horn 22 and also at the next succeeding step or stop of the carrier where the can-bodies are placed upon the horn by the operator.

The can-body ejector or extractor 36 preferably consists of a pair of hook-shaped fingers or jaws pivotally mounted upon a reciprocating slide or carriage 37, which moves back and forth on suitable guides 38 on the frame of the machine, the jaws or fingers being held closed against the horn by light springs 39 and having cam-shaped front ends 40, so that they may slip over the can-body as the ejector moves forward over the horn to permit the hooks to engage the rear end of the can-body. A set-screw 41 limits or adjusts the closing movement of the finger against the horn.

The necessary reciprocating movements may be automatically imparted to the ejector-carrying slide and to the seam-compressing-roller-carrying slide, and the necessary step-by-step or intermittent rotary movement to the table or carrier 12 by any suitable means or mechanism. The preferred means or mechanism for these purposes is illustrated in the drawings.

anism for these purposes is illustrated in the drawings.

The outer end of each of the horns 22 is in turn supported at the time the seam is being compressed by the roller 30 against the lower heater-bar by a roller 42, which is interposed between the outer projecting end 43 of the horn and the support 44 on the frame. This gives a firm support to the horn and insures uniform and proper compression of the parts or folds of the seam. The horn-supporting roller 42 is mounted on the arm of a rock-shaft 45 and is engaged by the projecting end 43 of the horn as the carrier 12 moves the horn into position to register with the seam-compressing roller, and thus moves the roller 42 onto the support 44 and at the same time rocks the shaft 45, which has another arm 46, connected by a link 47 with a lever 48, which operates, through the link 49 and lever 50, a clutch 51, by which the loose pulley 52 is clutched to the shaft 53, which carries the crank-wheel 54, that reciprocates, through the pitman or link 55, the slide 31, which carries the seam-compressing roller. The seam-compressing-roller-carrying slide is thus automatically set in operation by the movement of the horn 22 into position to cooperate with the seam-compression roller. The slide 37, which carries the can-body ejector 36, is simultaneously reciprocated, as it is connected by a link 56 with a crank-wheel 57 on a shaft 58, which is connected by gears 59 60 to the shaft 61, which is geared, through gears 62 63 80, on the shaft 53.

52 is the driving-pulley.

As illustrated in the drawings, the step-by-step or intermittent rotary movement is communicated to the table or carrier 12 by means of a notched wheel or ratchet 65 on its driving-shaft, which is engaged by a pawl or catch 66 on a swinging arm 68, that is operated by the crank-wheel 69 through the pitman or link 70. The driving-shaft of the rotary carrier or table is further provided with a notched locking or registering wheel 71, which is engaged by a lock bolt or block 72, operated by a spring 73, and which is disengaged by a projection 74 on the swinging pawl-carrying arm 68.

We claim—

1. The combination with a movable carrier or table, of a series of pairs of heater-bars mounted thereon, electric heaters inside said bars, a pair of contact or collector rings on said carrier, a series of movable arms upon which the upper heater-bars are mounted, a series of horns upon which the lower series of heater-bars are mounted, a reciprocating seam-compressing roller, a reciprocating can-body ejector, a cam or track for elevating the upper heater-bars, and a support for the outer end of each of said horns in turn while under action of the seam-compressing roller, substantially as specified.

2. The combination with a movable carrier, a series of horns mounted thereon, a series of

lower heater-bars secured to said horns, a series of upper heater-bars, and a series of movable arms to which said upper heater-bars are secured, substantially as specified.

3. The combination with a movable carrier, a series of horns mounted thereon, a series of lower heater-bars secured to said horns, a series of upper heater-bars, a series of movable arms to which said upper heater-bars are secured, and a stationary cam or track for lifting or raising the upper heater-bar-carrying arms, substantially as specified.

4. The combination with a movable carrier, a series of horns mounted thereon, a series of lower heater-bars secured to said horns, a series of movable arms to which said upper heater-bars are secured, and a seam-compression roller mounted upon a reciprocating slide, substantially as specified.

5. The combination with a movable carrier, a series of horns mounted thereon, a series of lower heater-bars secured to said horns, a series of upper heater-bars, a series of movable arms to which said upper heater-bars are secured, a seam-compression roller mounted upon a reciprocating slide, and a support for the outer end of each horn in turn while being operated upon by the seaming-roller, substantially as specified.

6. The combination with a movable carrier, a series of horns mounted thereon, a series of lower heater-bars secured to said horns, a series of upper heater-bars, a series of movable arms to which said upper heater-bars are secured, and a reciprocating can-body ejector, substantially as specified.

7. The combination with a movable carrier, a series of horns mounted thereon, a series of lower heater-bars secured to said horns, a series of movable arms to which said upper heater-bars are secured, a seam-compression roller mounted upon a reciprocating slide, and a can-body ejector mounted upon a reciprocating slide, substantially as specified.

8. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, and a series of electric heaters or carbons inside said bars and electric contacts or connections for the heaters, substantially as specified.

9. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, substantially as specified.

10. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, substantially as specified.

11. The combination with a movable car-

rier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, and a cam or track for lifting or raising said arms, substantially as specified.

12. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, a cam or track for lifting or raising said arms, and a seam-compressing device, substantially as specified.

13. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and electric contacts or connections for the heaters, and a seam-compressing device, substantially as specified.

14. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, and electric contacts or connections for the heaters, a seam-compressing device, and a can-body ejector, substantially as specified.

15. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, a seam-compressing roller and a reciprocating slide upon which it is mounted, substantially as specified.

16. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, a cam or track for lifting or raising said arms, a seam-compressing roller and a reciprocating slide upon which it is mounted, substantially as specified.

17. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, contact or collector rings on said carrier and with which said electric heaters or carbons are connected in multiple, the upper heater-bars of each pair being secured to movable arms on said carrier, a cam or track for lifting or raising said arms, a seam-compressing roller and a reciprocating slide upon which it is mounted, and a reciprocating

ing can-body ejector, substantially as specified.

18. The combination with a movable carrier, of a series of pairs of heater-bars mounted thereon, a series of electric heaters or carbons inside said bars, a series of horns on said carrier to which the lower heater-bars of each pair are secured, a seam-compressing roller, a reciprocating slide upon which said roller

is mounted, and a device engaged by the horn for setting said reciprocating seam-compressing-roller-carrying slide in operation, substantially as specified.

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Witnesses:

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