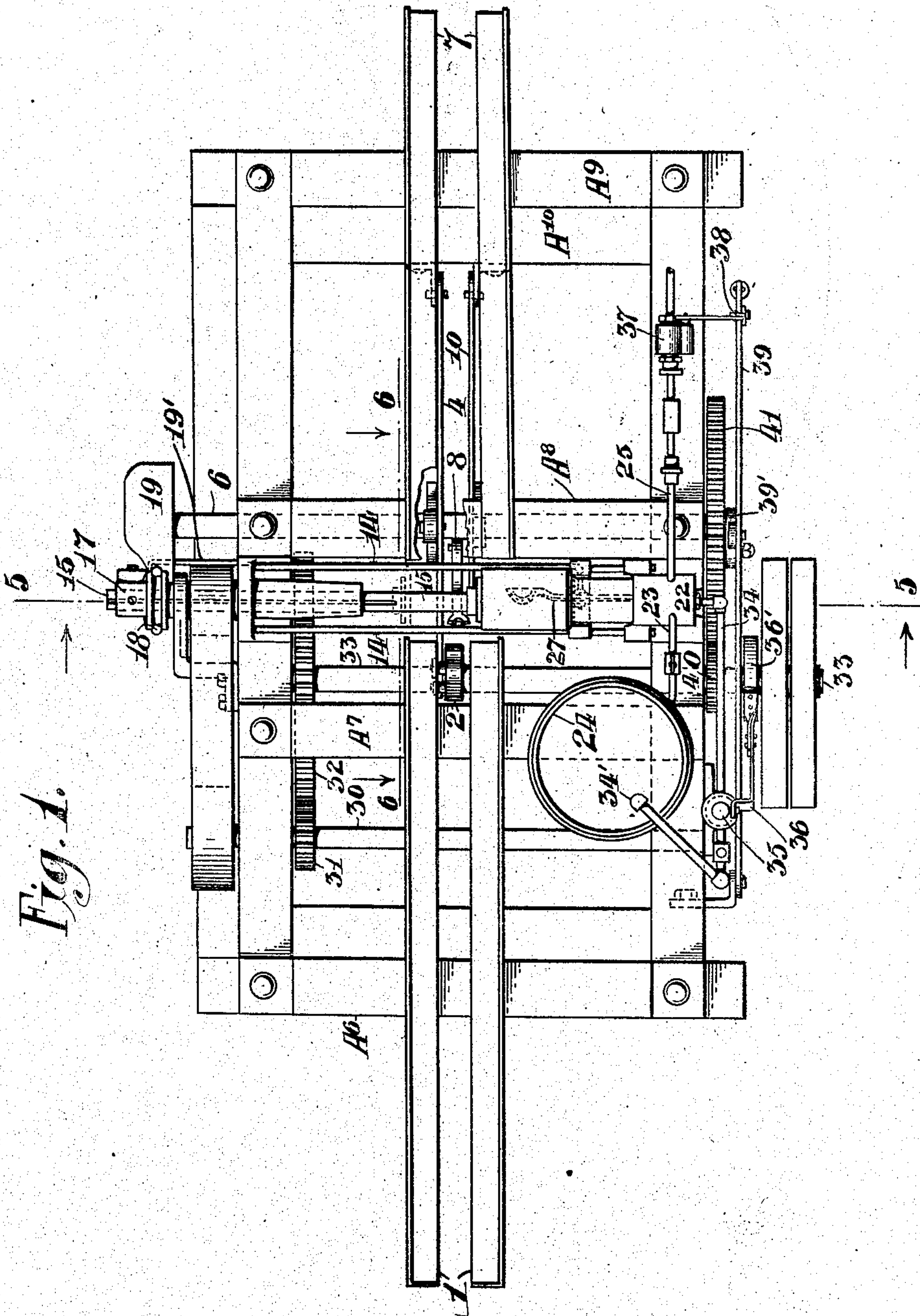


No. 815,402.

PATENTED MAR. 20, 1906.

C. S. BUCKLIN.
CAN LINING MACHINE.
APPLICATION FILED DEC. 7, 1904.

5 SHEETS—SHEET 1.



Witnesses
Edgewood Smith
John J. McElhinney

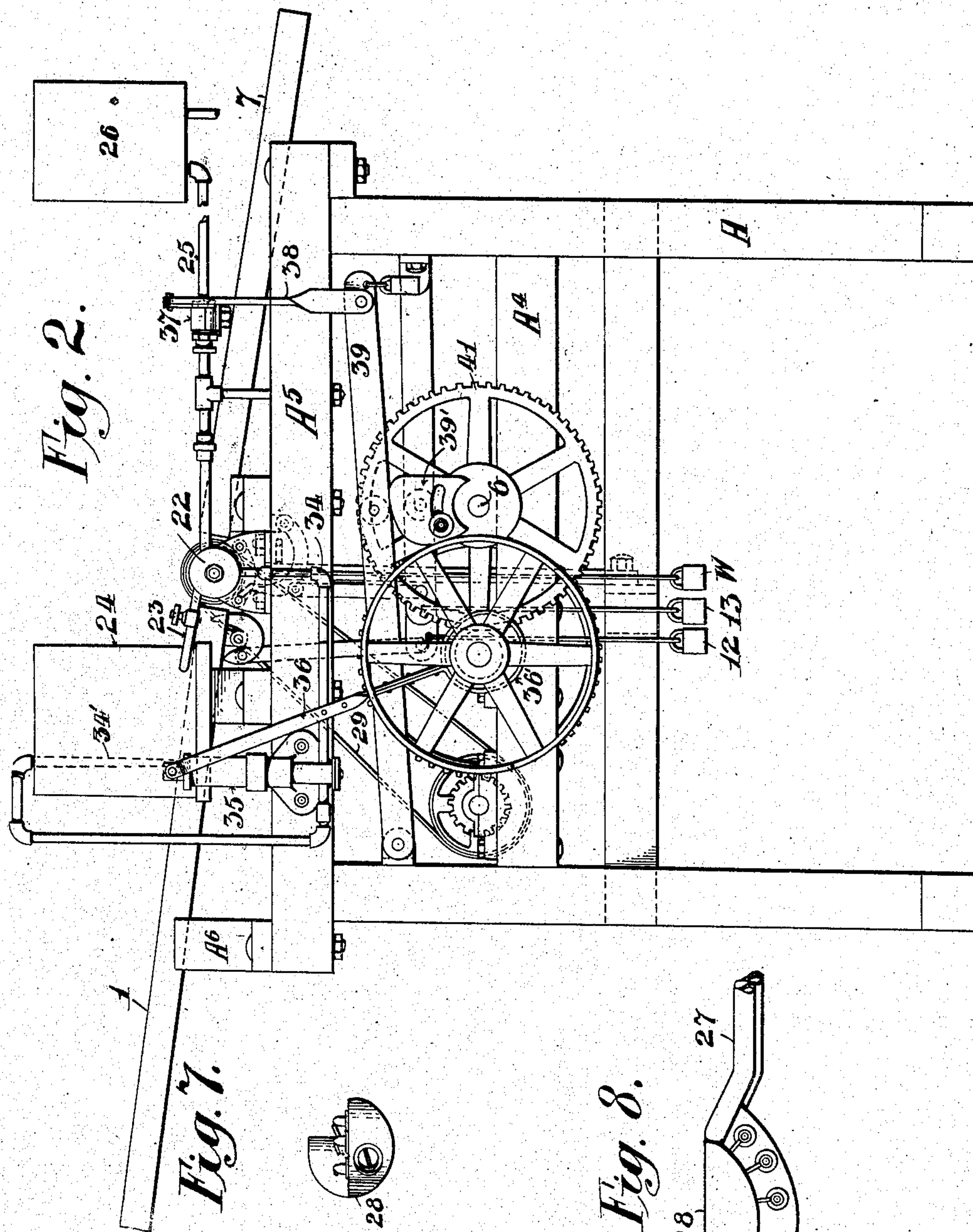
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5 SHEETS—SHEET 2.



Witnesses
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5 SHEETS—SHEET 3.

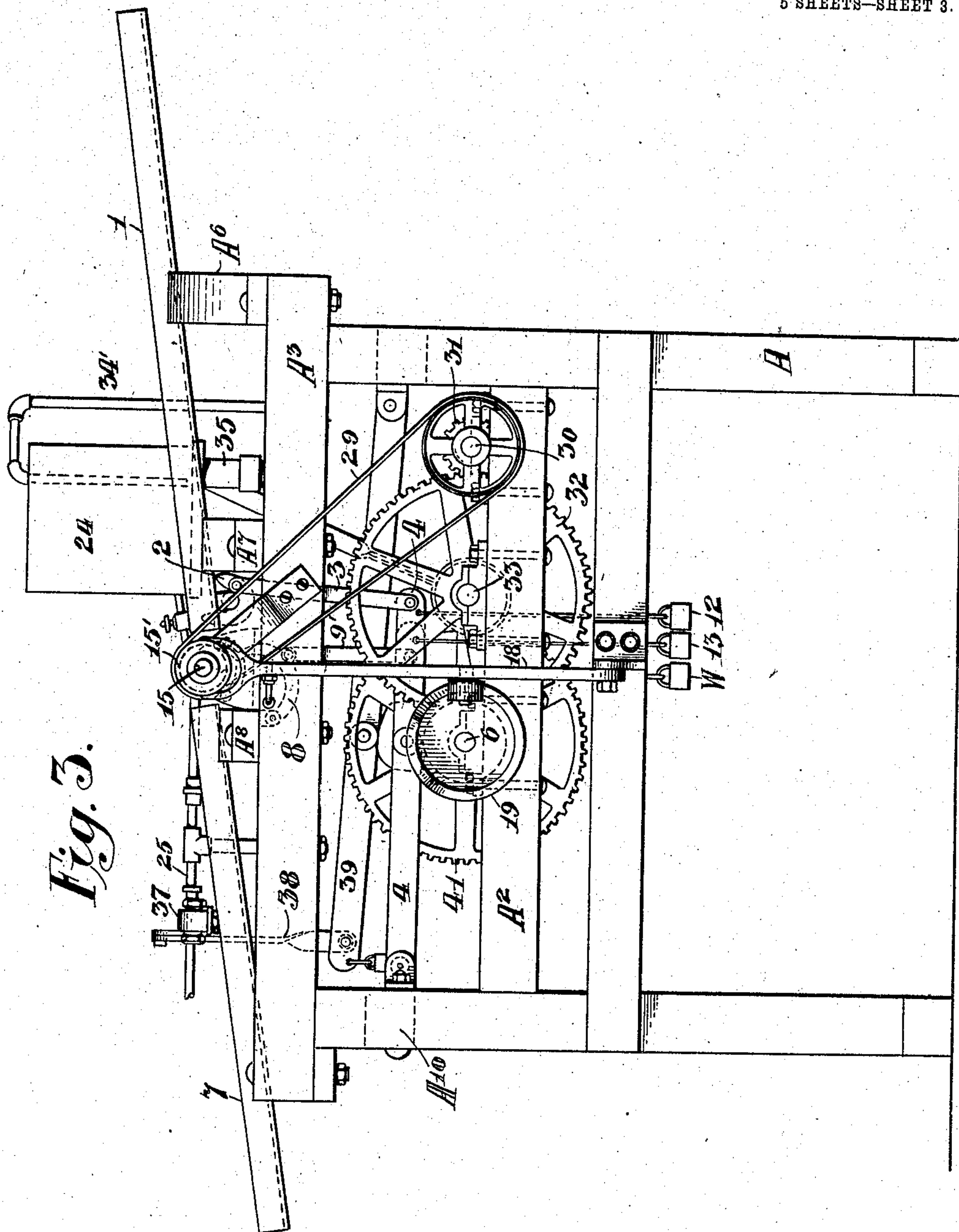


Fig. 3.

Witnesses
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5 SHEETS—SHEET 4.

Fig. 5.

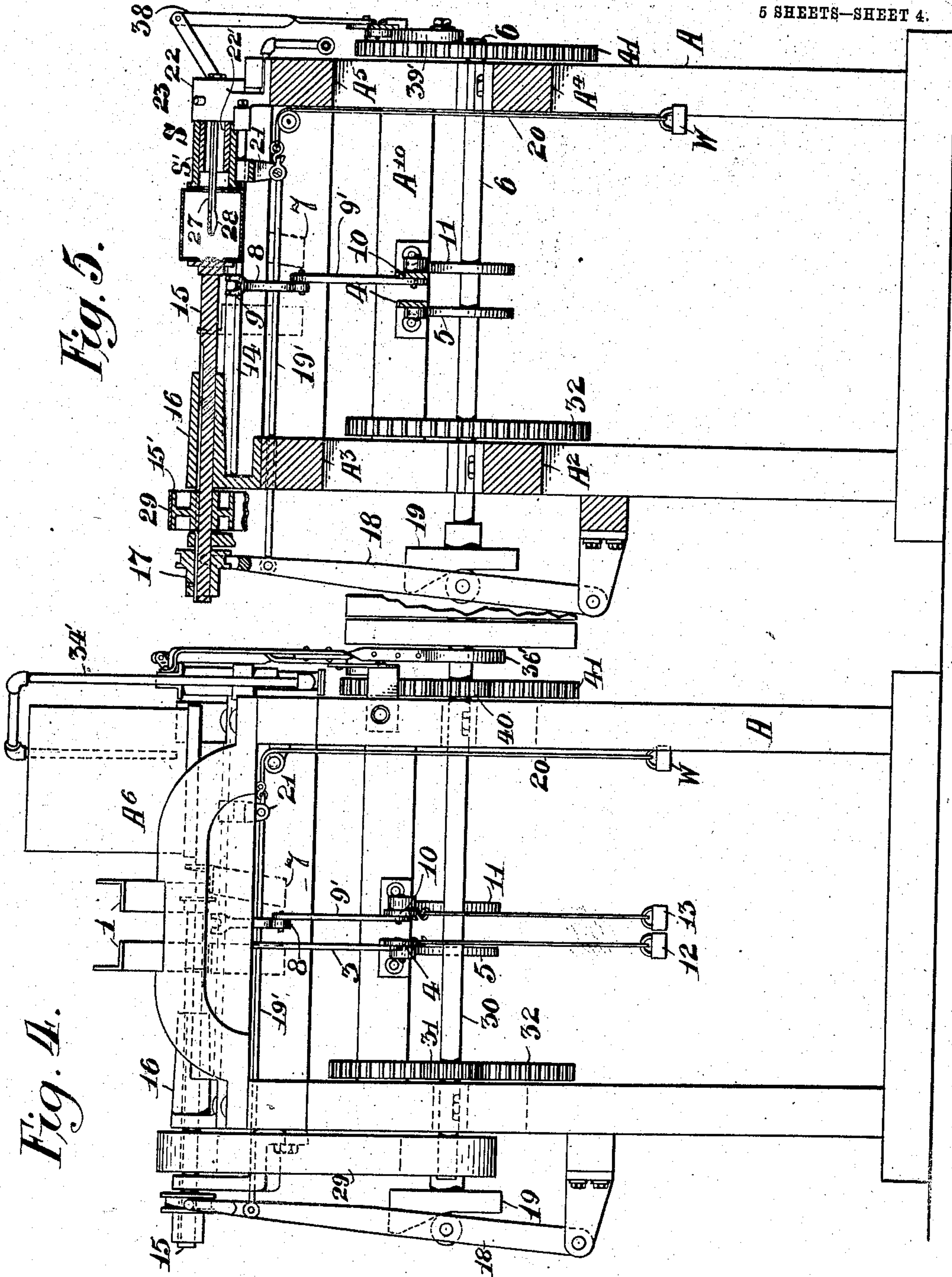


Fig. 4.

Witnesses
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5 SHEETS—SHEET 5.

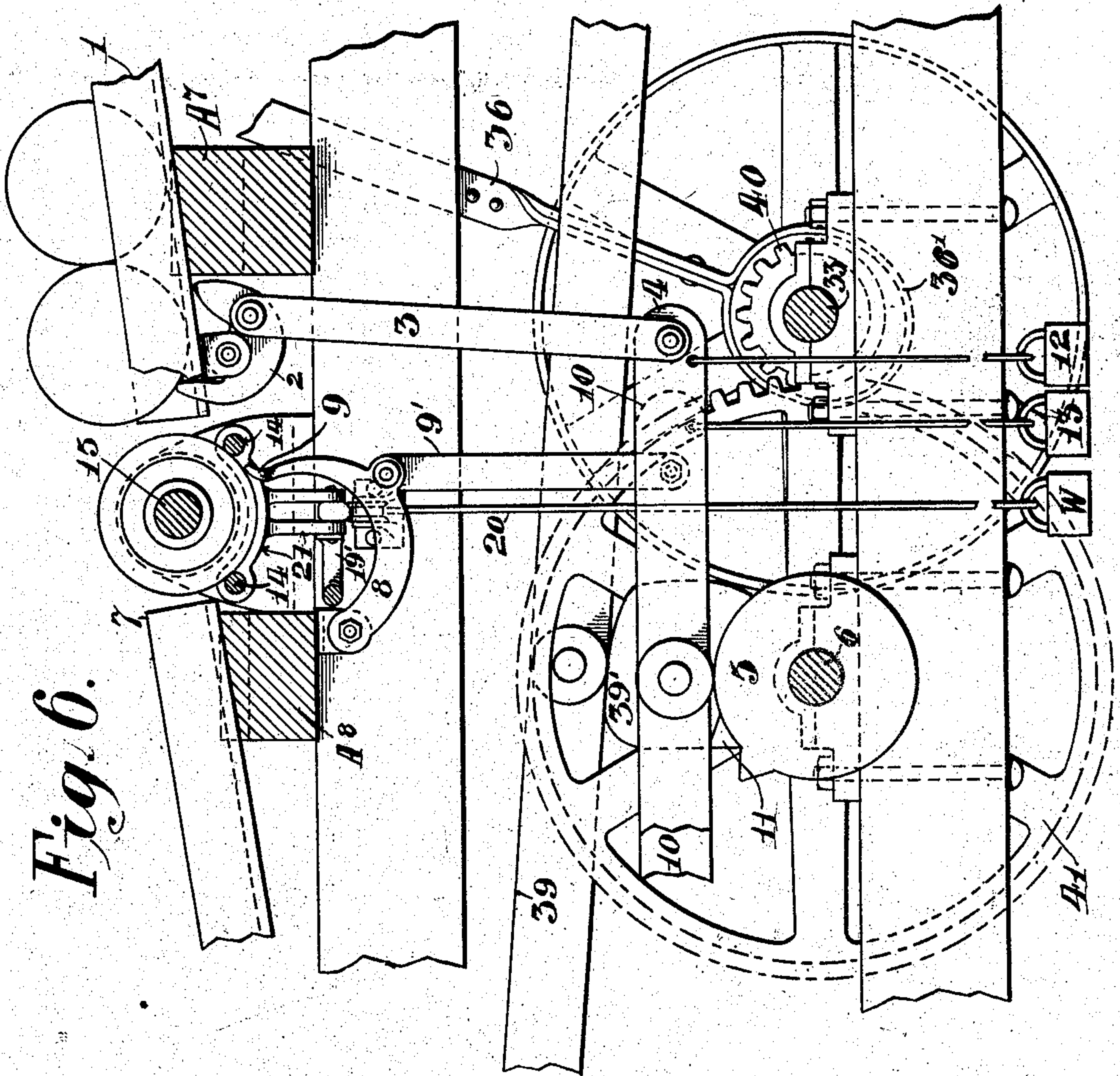


Fig. 6.

Witnesses
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UNITED STATES PATENT OFFICE

CHARLES S. BUCKLIN, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE
NATIONAL CANNING & MANUFACTURING COMPANY, A CORPORATION
OF NEW JERSEY.

CAN-LINING MACHINE.

No. 815,402.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed December 7, 1904. Serial No. 235,812.

To all whom it may concern:

Be it known that I, CHARLES S. BUCKLIN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Can-Lining Machines, of which the following is a full and true specification.

This invention relates to mechanism for applying linings in liquid form to the interiors of receptacles, and more especially to the interior of metal food-cans, the object of the invention being the provision of efficient automatic machinery whereby the lining material is applied to the cans thoroughly, uniformly, and with rapidity.

The invention also involves numerous features of advantage in the assemblage, construction, and operation of the several parts and combinations of the same, as will hereinafter be fully disclosed and more particularly pointed out in the accompanying claims.

Referring to the accompanying five sheets of drawings forming a part hereof, Figure 1 is a plan view of a machine embodying this invention. Fig. 2 is a side elevation of Fig. 1. Fig. 3 is a side elevation of Fig. 1 from the opposite side. Fig. 4 is an end elevation of Fig. 1 viewed in the direction of the travel of the cans. Fig. 5 is a transverse vertical section on the line 5 5 of Fig. 1 in the direction of the arrows and having parts broken away. Fig. 6 is an enlarged vertical sectional view on line 6 6 of Fig. 1; and Figs. 7 and 8 are end and plan views, respectively, of the spray-head.

The several moving parts of the apparatus are supported upon a suitable frame which may be formed in various ways for the purpose, but as shown herein consists of vertical columns A and a number of horizontal cross-frames A³ A⁴, &c. The cans to be lined are conveyed in the first instance through a feed-chute 1, which is conveniently comprised of two oppositely faced and spaced angle-irons secured to frame-bars A⁶ and A⁷ and inclined, as shown, so that the cans will roll or slide therein by gravity. At the lower or delivery end of the feed-chute an escape mechanism is provided in the form of an anchor-lever 2, pivoted to one of the angle-irons, so that its arms will alternately rise in the space between said irons as the said lever is oscillated, and this mechanism is properly adjusted and proportioned to permit a single can to

pass from the feed-chute for each oscillation thereof, the necessary movement for this purpose being imparted to the anchor-lever through a link 3 and cam-lever 4, operated by a suitable cam 5 on the cam-shaft 6. The can thus delivered by the escape mechanism is received upon a support and engaged by certain means presently to be described, whereby it is brought relatively into the field of a spraying device which projects into the interior of the said can and emits a forcible spray of the liquid lining material, the latter being in this manner applied to the can. The can is preferably, though not necessarily, rotated during this process and at the conclusion of the spraying the can is discharged into a delivery-chute 7. The delivery-chute is much of the same construction as the feed-chute, except that it is tapered or flaring at its receiving end, and it is mounted with a downward inclination upon the cross-supports A⁸ and A⁹. The discharging mechanism whereby the can is directed into the said chute comprises a curved tappet-arm 8, pivoted to the frame-piece A⁸ and provided with a widened or forked free end 9, which is adapted to swing upwardly and strike the can a quick blow, thereby ejecting it from the transferring or spraying devices. The widened or forked end of the said lever is efficacious in preventing the tilting of the can under the sudden impact of the ejector and in giving it direction into the chute. The proper movement of the ejector for this purpose is given by the link connection 9' and cam-lever 10, operated by a cam 11 on cam-shaft 6. The scape and ejector levers above described are connected with cam-levers 4 and 10, respectively, which said levers are parallel and pivoted both to the cross-frame A¹⁰, Figs. 4 and 5. The cams which operate them move them positively in one direction only, their return movement being effected by their own gravity and the gravity of the attached weights 12 and 13. This construction, however, is capable of material alteration, as it is obvious that other varieties of eccentric operating means obviating the weights, and even the links or cam-levers, can be employed with equal effect. The subjecting of the can to the action of the spraying device may also be accomplished in different manners within the scope of this invention, it being borne in mind that the said device must momentarily project within the can and subse-

quently become removed relatively therefrom. As shown herein, the spraying device S is stationary in respect of such relative movement, and the can is transferred into operative relation to it by means of a slideway and a cooperating pusher-shaft. The slideway is composed of two parallel rods 14 14, suitably supported on the frame transverse to the feed-chute and in such position as to receive and support the can discharged therefrom. The pusher-shaft 15 is mounted for longitudinal movement parallel with the slideway in a long journal-bearing 16, which also affords a convenient support for the ends of rods 14. At its inner end it is provided with an enlargement or head, which is adapted to encounter the can-bottom centrally, and its outer end is provided with an annularly-grooved collar 17, engaged by the forked end of a cam-lever 18. The latter is appropriately pivoted to the frame and is positively actuated in an outward direction by the cylinder-cam 19, return or inward movement being effected by a yielding force, such as a spring or the weight W, connected to said lever 18 by the horizontal link 19' and cord 20. The remainder of the can-transferring means comprises a retractor 21, which, however, is functionally a cooperative part of the pusher-shaft in that it moves in unison therewith and engages with the can to bring the latter back to the point at which it was deposited from the feed-chute. It may obviously assume various forms and is shown herein as a yoke, embracing each of the rods 14 and connected by link 19' to slide thereon positively with the pusher-shaft. The distance between the pusher-head and said yoke is greater than the length of the can, so that the latter may fall freely between the two upon the support or slideway.

The specific construction of the spraying device S forms no part of the present invention, and it will be sufficient to state briefly that it is comprised of a casing 22, bolted to the frame and also so formed as to provide a seat for the ends of the rods 14, which constitute the can-supporting means. A pipe 23 leads into this casing from a tank 24 of the liquid lining material, and another pipe 25 leads into the chamber from a source of fluid-pressure 26, Fig. 2, and both pipes emerge from the casing in the form of a compact shaft 27, terminated by a spray-head 28, which is shown in enlarged scale in Figs. 7 and 8. This device comprises liquid-tubes and fluid-pressure tubes in atomizing relation and so disposed as to emit a blast or spray when in operation throughout an arc of about one hundred and eighty degrees and in a substantially fixed plane, this being the most practical and efficient way of manipulating the extremely volatile and somewhat sticky material which forms the lining. For this reason it becomes necessary to rotate the can rela-

tively to the said blast or spray, and while such relative rotation can be effected in various manners within the scope of this invention it is conveniently done by rotating the pusher-shaft, for which purpose the gear or pulley 15' is splined to the said shaft and is driven by belt 29 or other equivalent gearing from the shaft 30, which latter is provided with a pinion 31, meshing with a spur-gear 32 on power-shaft 33. In the above-described manner the pusher-shaft is constantly rotated and at comparatively high speed. The spraying device S is provided with a rotary abutment S' in the form of a flanged sleeve supported on a tubular boss 22', surrounding the shaft 27. During that part of the operation in which a can is pressed against this abutment S' it is obvious that it and the can will be easily rotated by shaft 15. The abutment is preferably faced with soft material, as leather or rubber, to afford a friction-bearing for the can-head; but this is not essential, and indeed the function of this abutment can be carried out by any fixed-antifriction means which will allow the can to be rotated by the said pusher-shaft.

For certain reasons it is desirable that the liquid lining material be kept in constant agitation, and for this purpose the supply-cock in the pipe 23 is adjusted to deliver more of such liquid than is actually needed and the spraying device is provided with a pipe 34, which carries off the excess, and the liquid in this pipe is forced back into the tank 24 by a pump 35. The latter is constantly driven by the eccentric-rod 36 and eccentric 36' on the power-shaft 33, in this manner keeping up a continuous circulation of the said liquid through the spraying device. The force-pipe 34' of the pump debouches near the bottom of the tank and is preferably tapered so that the discharge therefrom will tend to produce a commotion of the liquid. Other and additional means may also be supplied, if desired, to keep up an agitation of the liquid contained in tank 24. The air or other fluid pressure involved with the spraying device is automatically controlled by the apparatus to come into action intermittently, or at such times as the cans surround the spray-head 28. Such pressure-controlling means is most conveniently a stop cock or valve 37, applied to pipe 25 and operated by a link 38 and cam-lever 39, in turn actuated by a cam 39' on the shaft 6; but the plunger of an air-compressor might obviously be operated by said cam-shaft to produce the desired air-blast in the spray-head.

The shaft 6 is common to the various mechanisms of the machine, being driven from the power-shaft 30 by means of a pinion 40 and spur-gear 41. The cam 39' on the gear 41 is adjustable thereon so as to vary the time as well as the force and duration of the action of the spraying device. The other cams on

the said shaft may also be adjustable to regulate their various functions.

In operation the cans pass or roll down the feed-chute 1, being delivered by the escape-lever one by one onto the slideway. The properly-timed rotation of cam 19 thereupon permits the weight W to move the cam-lever 18 and rotate the pusher-shaft 15 inwardly a sufficient distance to slide the can along the slideway into engagement with the rotary abutment S', this being the position of the can indicated in Fig. 5, in which the spraying device projects into the interior of the can. The yielding pressure of the weight creates sufficient friction between the pusher-head and the can to cause the latter to partake of the rotary movement of the head, and while this pressure endures the cam 39' opens the stop-cock 37, bringing the spraying device into action and holding it in such condition a greater or less period according to the concentric formation of said cam. The rotating can in the meantime receives on its inner wall a uniform coating or lining which is thin or thick according to the duration of its subjection to the action of the spraying device. Subsequently the stop-cock 37 is automatically closed, and the cam 19 forces the cam-lever 18 and its attached parts outwardly. The retractor takes against the can-head and withdraws the can to its former position in line with the feed and delivery chutes, whereupon the cam 11 imparts a sudden upward movement to the ejector 8, and its free end rising between rods 14 14 strikes the can and lifts and discharges it into the delivery-chute. Immediately following this action the cam 5 oscillates the escape-lever 2, and a fresh can is placed on the slideway, and the above-described process indefinitely repeated.

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

1. A can-lining machine, comprising a support for a can and a spraying device adapted for intermittent operation, in combination with transferring mechanism for bringing said spraying device and can into operative relation and means controlled by the machine for operating the spraying device.

2. A can-lining machine, comprising a support for a can and a spraying device adapted for intermittent operation, transferring mechanism cooperating with said support to bring said spraying device and can into operative relation with each other, in combination with gearing for producing relative rotation between said can and said device and a pressure-controlling apparatus for the latter device actuated by said gearing so as to be in operation during the period of such rotation.

3. In a can-lining machine, a slideway adapted to support a can, a spray-head disposed at one end of said slideway in position to project within the can, and can-transfer-

ring means reciprocating substantially parallel with said slideway for presenting a can thereon to the action of said spray-head.

4. In a can-lining machine, a slideway adapted to support a can, a spray-head disposed at the end of said slideway in position to project within the can, and rotating can-transferring means movable parallel with said slideway to present the can to the action of said spray-head, said rotating means being yieldingly impelled in the direction toward said spray-head.

5. In a can-lining machine, a slideway adapted to support a can, a spray-head disposed at the end of said slideway in position to project into the interior of the can, can-transferring means cooperating with said slideway to present the can to the action of said spray-head, said means comprising a reciprocating pusher-shaft, gearing for actuating the same positively in one direction and a yielding force for actuating it in the other direction.

6. In a can-lining machine, a spray-head, a source of fluid-pressure for said spray-head and means for controlling the application of such pressure thereto, in combination with a reciprocating element for presenting a can to the said spray-head, so that the can surrounds or envelops said spray-head, a shaft common to said pressure-controlling means and said reciprocating element, and imparting motion thereto, and eccentric devices on said shaft for producing an application of fluid-pressure to the spraying device during the presentment of the can to said spray-head.

7. In a can-lining machine, a spraying device, a source of fluid-pressure for said device and means controlling the application of such pressure thereto, in combination with a reciprocating and rotating can-transferring shaft for presenting a can to said spraying device and rotating it around the same, a gear-wheel splined to said shaft by which it is rotated, and a cam-shaft provided with a cam actuating said pressure-controlling means and gearing connected with said cam-shaft for reciprocating said can-transferring shaft, the said parts being so arranged as to cause the spraying device to be in operation while the can surrounds it.

8. In a can-lining machine, a spraying device, a source of fluid-pressure for said device and connections comprising a valve between said device and source, a slideway adapted to support a can, and can-transferring means cooperating therewith to present a can to the action of said spraying device so that the can surrounds or envelops said spray-head, in combination with a cam-shaft and cams thereon for conjointly operating said valve and can-transferring means.

9. In a can-lining machine, a slideway comprised of parallel rods adapted to support

a can, a spraying device attached to said rods and adapted to project within a can borne thereby, and means for presenting a can to the action of said spraying device.

5 10. In a can-lining machine, a slideway for a can and a spray-head disposed at one end of said slideway in position to project within a can, in combination with a reciprocating pusher-shaft for presenting a can to
10 said spray-head and a can-retractor traveling on said slideway.

11. In a can-lining machine, a slideway for a can and a spray-head so disposed as to project within a can thereon, a reciprocating
15 pusher-shaft for presenting a can to the said spray-head and a can-retractor traveling on said slideway in unison with said shaft, the distance between said shaft and retractor being greater than the length of the can.

20 12. In a can-lining machine, a can-transferring means comprised of a reciprocating and rotating pusher-shaft adapted to engage the can and a can-retractor reciprocating in unison with said pusher-shaft and also en-
25 gaging the can, in combination with a spray-head adapted to project within the interior of said can.

13. In a can-lining machine, a slideway for a can comprised of parallel rods, a spray-
30 head disposed thereon to project within a can, and provided with a rotatable can abutment, in combination with a rotating can-transferring means for moving a can along said slideway against the abutment, and ro-
35 tating the can while it surrounds the spray-head.

14. In a can-lining machine, a slideway for a can comprised of parallel rods, a spray-
40 head disposed thereon to project within the can and a journal-seat secured to said rods, in combination with a rotating shaft in said journal-seat extending substantially parallel with said rods and means for reciprocating and rotating said shaft within its journal-
45 seat.

15. In a can-lining machine, a spraying device emitting a spray of liquid lining material in a fixed plane throughout an arc of substantially one hundred and eighty degrees, can-transferring means for presenting a can to
50 the action of said spraying device, so that the can surrounds and envelops said spray-head, and gearing whereby said can is rotated in said position.

16. In a can-lining machine, a can feed
55 and escape mechanism cooperating therewith to periodically discharge a can therefrom, a slideway transverse to said feed receiving said discharged cans, a spraying device at one end of said slideway and a reciprocating
60 pusher-shaft at the other, in combination with a cam-shaft actuating said escape mechanism, spraying device and pusher-shaft.

17. In a can-lining machine, a can-feed, a
65 slideway transverse thereto and receiving cans from said feed, a spray-head at one end of said slideway and can-transferring means for sliding a can along said slideway to a position surrounding said spray-head, in combination with a retractor for withdrawing
70 the cans, an ejector for said slideway for removing the can therefrom and a delivery-chute receiving said can from the ejector.

18. In a can-lining machine, a spraying device, a support for a can and means for bring-
75 ing said spraying device and can into operative relation with the can surrounding said device, a source of fluid-pressure for said spraying device and a reservoir for the liquid to be sprayed, in combination with agitating
80 means cooperating with said reservoir to keep said liquid in motion.

In testimony whereof I have signed my name to the specification in the presence of two subscribing witnesses.

CHARLES S. BUCKLIN.

Witnesses:

V. BOND-MAUPIN,
CHARLES MATT.