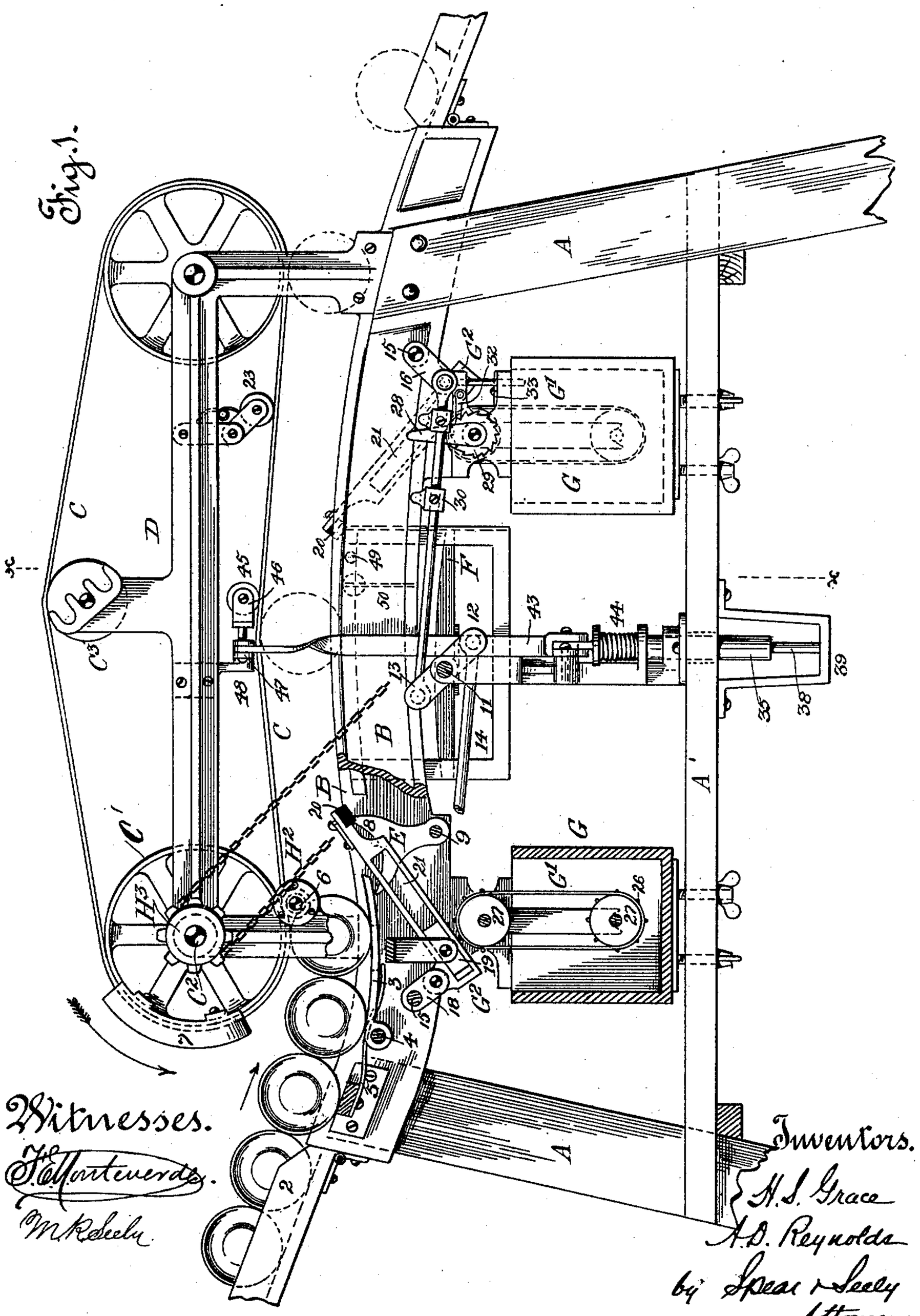
(No Model.) 4 Sheets—Sheet 1.

H. S. GRACE & A. D. REYNOLDS.

CAN LABELING MACHINE.

No. 592,585. Patented Oct. 26, 1897.

Fig. 1.



Witnesses.
F. C. Montenerdo.
M. R. Seely.

Inventors.
H. S. Grace
A. D. Reynolds
by Spear & Seely
Attorneys

(No Model.) 4 Sheets—Sheet 2.

H. S. GRACE & A. D. REYNOLDS.

CAN LABELING MACHINE.

No. 592,585. Patented Oct. 26, 1897.

Fig. 2.

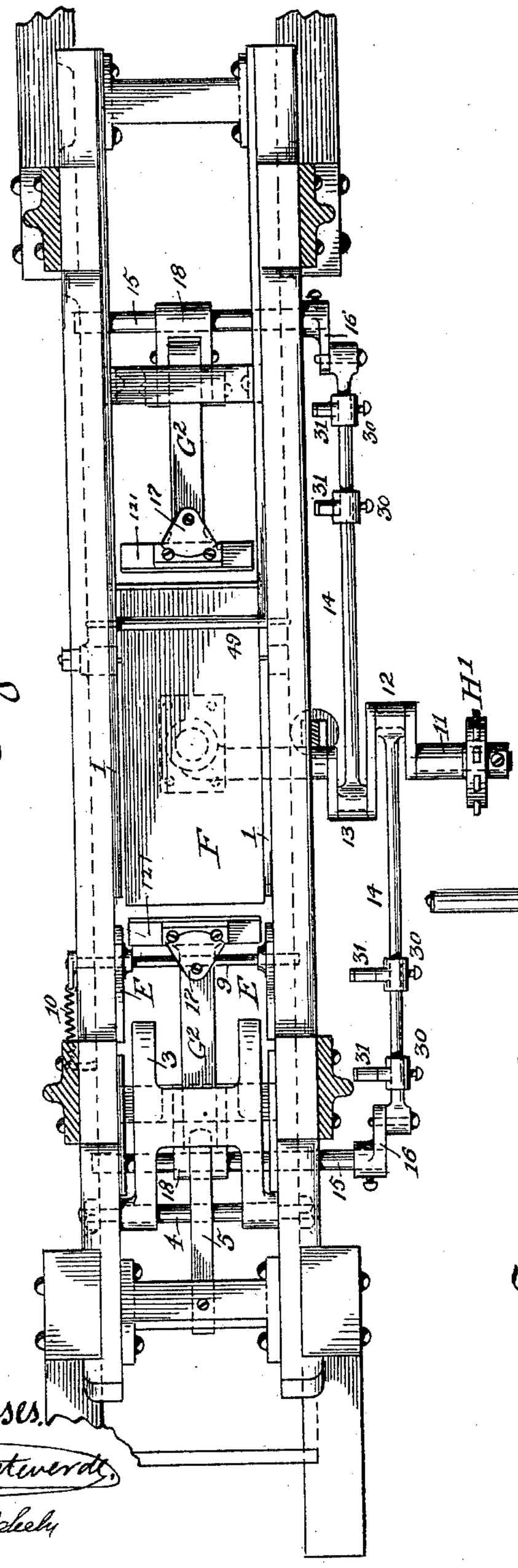
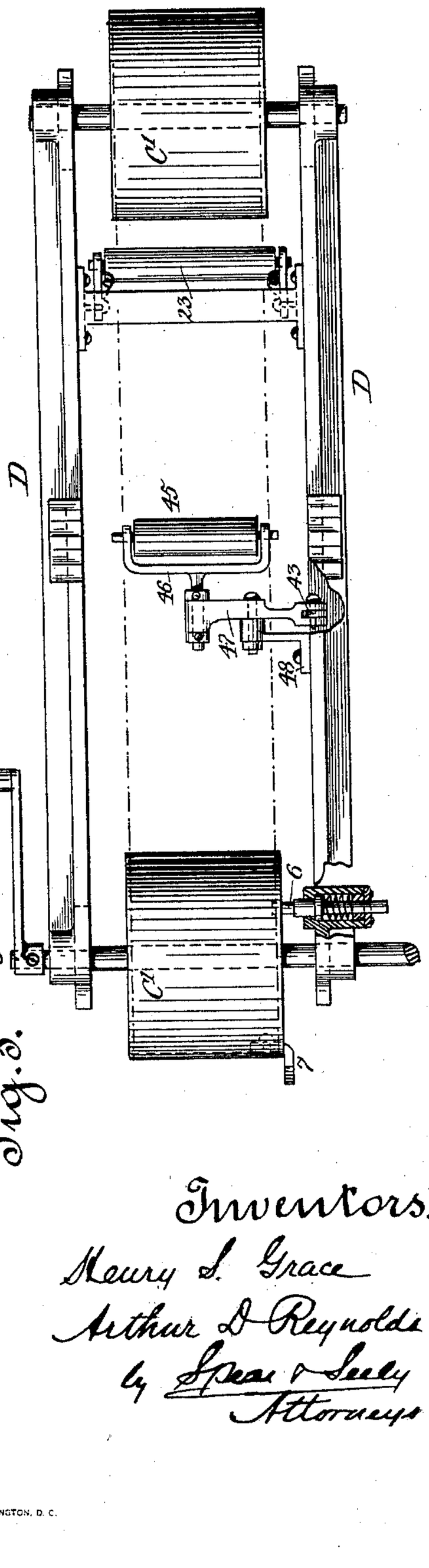


Fig. 3.



Witnesses.
F. C. Monteverde,
M. Reeby

Inventors.
Henry S. Grace
Arthur D. Reynolds
by Spear & Seely
Attorneys

(No Model.) 4 Sheets—Sheet 3.

H. S. GRACE & A. D. REYNOLDS.

CAN LABELING MACHINE.

No. 592,585. Patented Oct. 26, 1897.

Fig. 5.

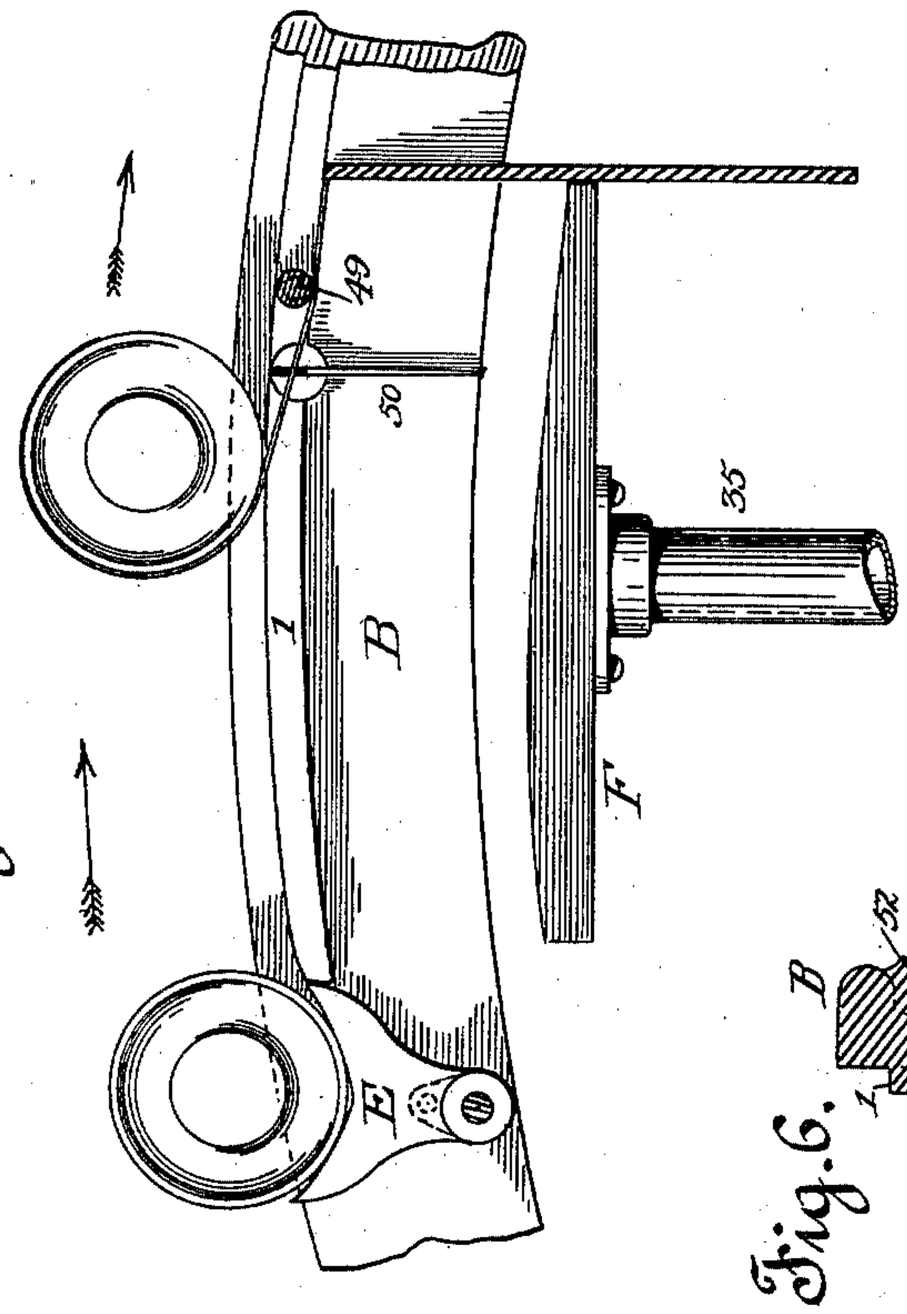


Fig. 6.

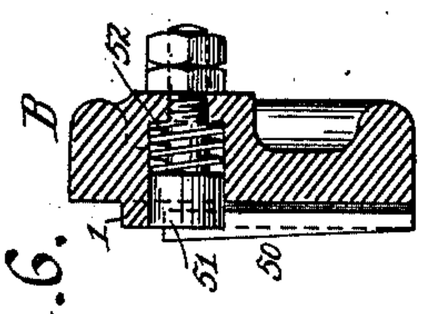


Fig. 7.

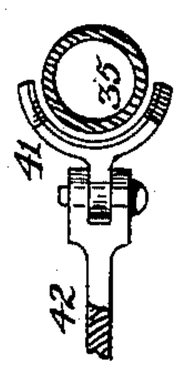
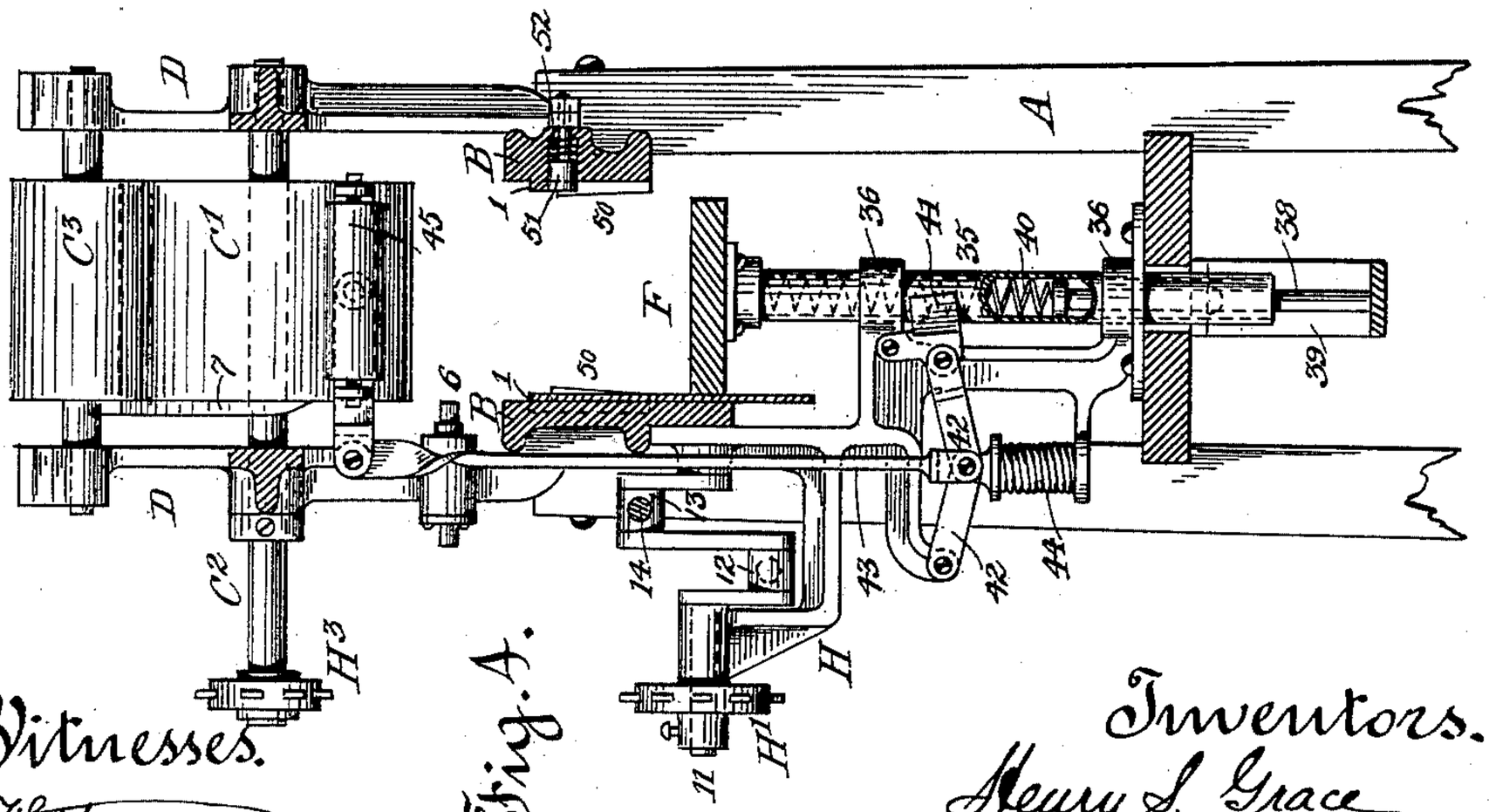


Fig. 4.



Witnesses.

J. E. Montenverde,

M. R. Seely

Inventors.

Henry S. Grace

Arthur D. Reynolds

by Spear & Seely.

Attorneys

(No Model.) 4 Sheets—Sheet 4.

H. S. GRACE & A. D. REYNOLDS

CAN LABELING MACHINE.

No. 592,585. Patented Oct. 26, 1897.

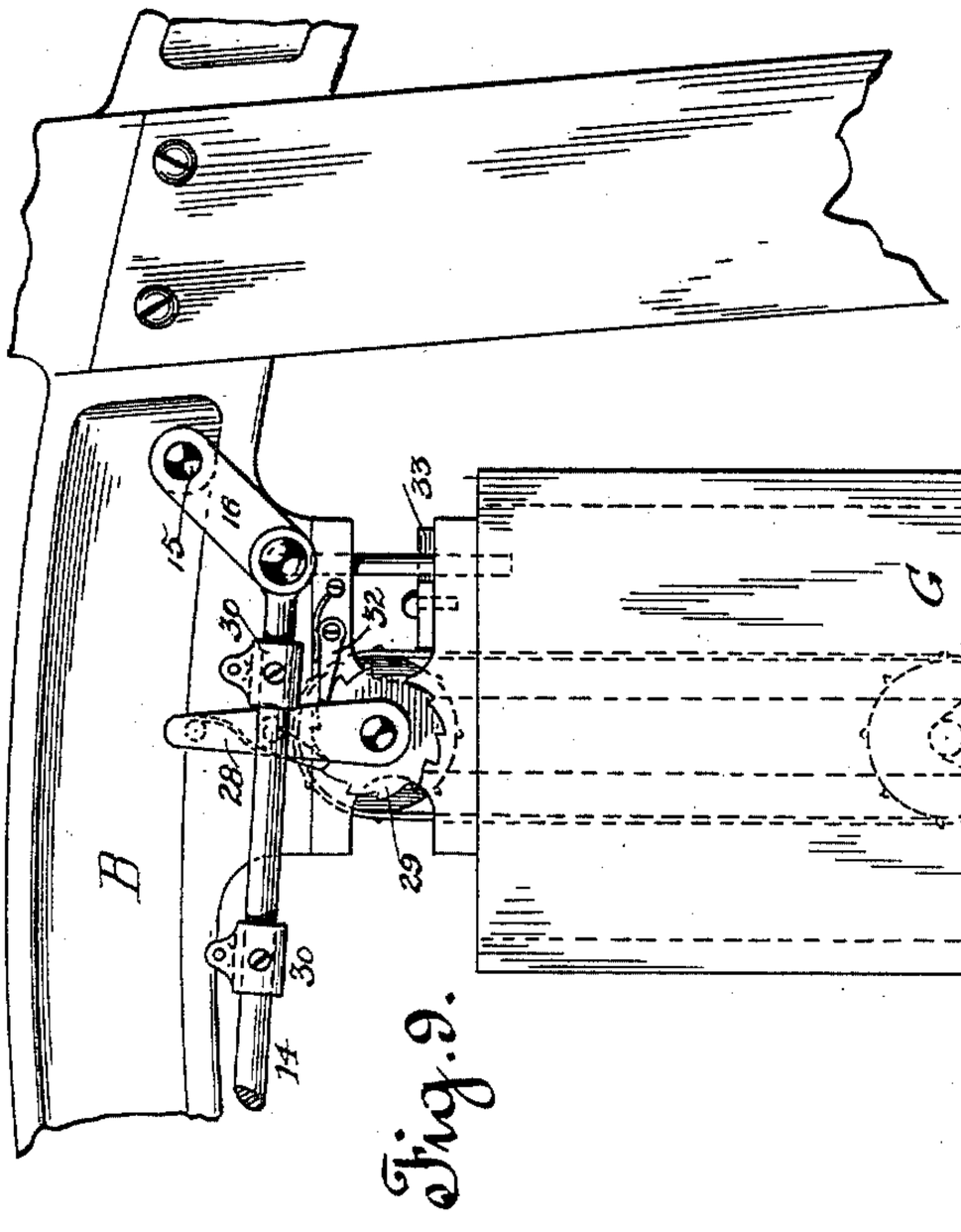


Fig. 9.

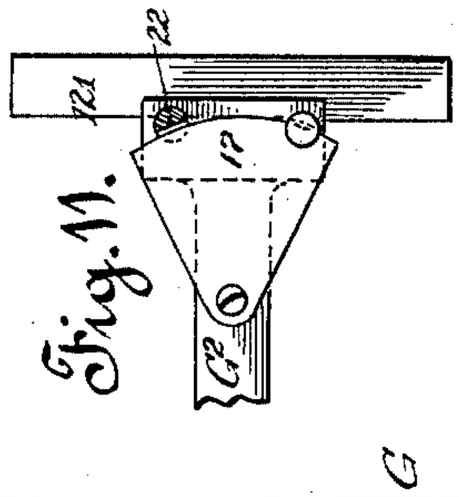


Fig. 11.

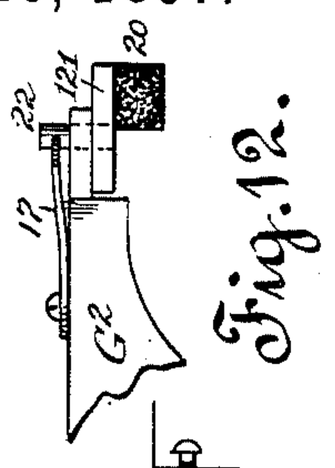


Fig. 12.

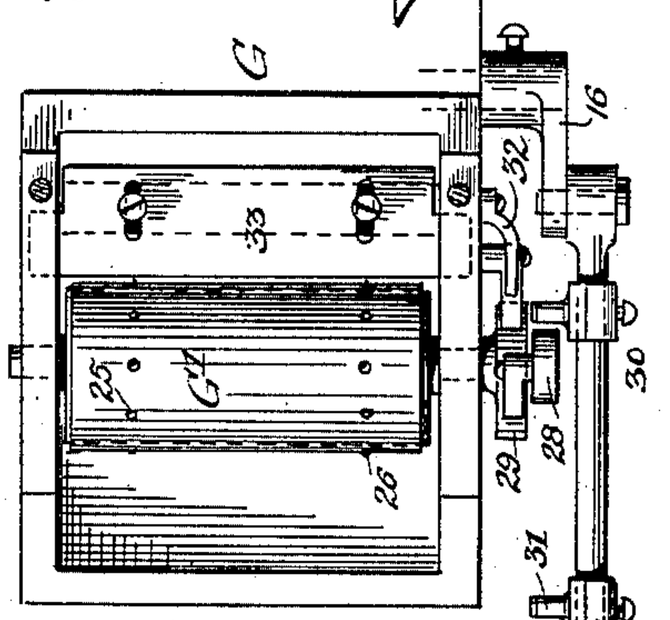


Fig. 10.

Fig. 8.

Witnesses.
F. Allen Everdell.
M. R. Seely

Inventors
H. S. Grace
A. D. Reynolds
by Spear & Seely
Attorneys

UNITED STATES PATENT OFFICE.

HENRY S. GRACE AND ARTHUR D. REYNOLDS, OF SAN FRANCISCO, CALIFORNIA.

CAN-LABELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 592,585, dated October 26, 1897.

Application filed April 3, 1896. Serial No. 586,104. (No model.)

To all whom it may concern:

Be it known that we, HENRY S. GRACE, a citizen of the United States, and ARTHUR D. REYNOLDS, a subject of the Queen of Great Britain, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Can-Labeling Machines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to labeling-machines, and particularly to that class of machines by which labels are affixed to cylindrical bodies, such as sheet-metal cans, &c.

Our object is to produce a machine which will affix labels around cans rapidly and accurately—that is, in their true and correct positions on the body of the can—so that the overlapping ends of the labels will be in correct position and no part of the label be askew or out of line.

Our invention contains special improvements for truing the can before it takes its label, improvements in the means for applying paste to both ends of the label, in the means for supplying the labels, and also in many details of construction which need not be specified here, but which are fully hereinafter described and are shown in the accompanying drawings, in connection with which this specification should be read.

In the drawings, Figure 1 is a side elevation of the whole machine. Fig. 2 is a plan view with the belt which propels the cans removed. Fig. 3 is a plan view of the frame and rollers which carry the belt. Fig. 4 is a cross-section through the machine on the line *x x* of Fig. 1. Fig. 5 is a detail view of part of the guideway, showing also the label-bed and the paste-spreading roller. Fig. 6 is a cross-section of the guideway, showing the yielding stud and knife-blade. Fig. 7 is a horizontal cross-section of the stem of the label-bed, showing the brake. Fig. 8 is a side elevation of the receiving end of the machine, illustrating the operation of the pasting-pad. Fig. 9 is a side elevation of the paste-box, showing the means for driving the paste-belt. Fig. 10 is a plan view of the same. Fig. 11 is a detail plan view of the paste-applying pad. Fig. 12 is a side elevation of the same.

The machine is supported by a frame A, to the legs of which is bolted the runway B, upon which the cans travel through the machine. The runway is composed of side pieces having an upward curve and provided with curved tracks 1 1, upon which the can is guided in its movement. The object of the curved runways is to provide means for producing a uniform pressure on the can as it is propelled through the machine by the driving-belt C. Former experience has demonstrated that when a propelling-belt was used with straight runways there was a diminishing pressure on the can as it approached the middle of the belt between the guide-rollers, and the effect produced was not entirely satisfactory. A flexible belt C is used for propelling the cans by frictional contact, and as this belt is carried on end rollers C′ horizontally above the runway the can in its passage is always pressed strongly and equally against the belt by the curved shape of the tracks upon which it travels. The rollers C′ are journaled at the ends of a supplemental frame D, supported above the main frame and guideway, one of their shafts C^2, Fig. 3, constituting the driving-shaft of the machine, being fitted with a crank, power-pulley, or other means for giving it motion.

The belt C runs over an adjustable tightening-roller C^3, Fig. 1. The cans to be labeled enter the machine from a chute 2. The runway is open from below throughout its whole extent, so that the various devices for applying paste and supplying labels may be carried below the guideway and can be worked upwardly between the side pieces B. The can on entering rolls upon a plate 3, pivoted upon a rod 4 and having a spring 5, which tends to throw it upward, pressing the can against the belt C. The object of this plate is to exert an upward pressure, so as to insure contact between the can and driving-belt. It forms a yielding runway at that portion of the travel of the can, there being nothing else to support the can at that point. There is a lack of absolute uniformity in the size of cans supposed to be the same size, and if the runway is made unyielding at that point some cans will be so small that the belt will not take them, while others will be so large that they

would get dented in as they passed under the center of the rollers. Each can is arrested and held just as it comes in contact with the propelling-belt by a stop 6, which is a spring-bolt projecting from the frame of the machine into the path of the cans and just below the belt. The object of this stop is to cause the cans to enter the machine at regular and proper intervals and to avoid any crowding of cans in the machine. A can enters at each revolution of the driving-shaft C^2, and the belt-pulley C′ on such shaft is provided with a cam 7, which holds the stop out long enough for a can to be seized and carried along by the belt. When the stop is in its normal position and projecting out in front of the first can, the belt simply slips on the foremost can without propelling it, the yielding runway before described making allowance for slight variations in the sizes of the cans. The can, after leaving the yielding runway, rolls immediately upon a truing device, which we consider one of the most important features of our invention. Cans, even when supposed and intended to be of the same size, often vary slightly in length, and hence we must make our runway of such size as to allow for these slight variations. Some cans will fit the runway more closely than others, and, this being the case, in all machines in which the cans roll over and take up their labels it has been found that some cans are slightly inclined to the runway, and hence take their labels at that slight angle. Such variation is greatly multiplied by the time the whole long label has been taken up, the result being that the ends of the label do not meet accurately, and the label presents a bad appearance. We overcome this difficulty by automatically truing the can just before it reaches the label and commences to take it up. After that there is no further difficulty.

The means which we prefer to use and have shown for truing the can consists of a cradle, which receives the can directly from the yielding runway 3 and delivers it to the guide-tracks, upon which it continues its movement. To each side rail of the runway and in its inner side is pivoted a plate E, having projecting arms 8, the two being opposite one another and together constituting the cradle. (Compare Figs. 1 and 2.) A single block might be substituted for the two plates. We prefer to secure both plates to a rock-shaft 9, journaled in and across the runway and held in position by a spring 10, Fig. 2. These plates may be curved, as shown, or might be of V shape; but in either case they, combined, afford a rest for the can and give it four points of support, Fig. 5, two on each side. The curved plate is not intended to conform to the outline of the can, as we have found that the can is better trued by having only the ends or corners of the cradle in contact with its surface. When the can rolls upon the cradle, it is already in contact with and under pressure from the propelling-belt, which is carrying it forward. Hence while the can is swinging the cradle forward with it, it is also seating itself on the cradle in contact with all the arms 8, and this position is the correct position in which it should come in contact with its label, so as to insure correct labeling. No matter whether after this it be loose in the guideway or not so long as it is correctly set at right angles to the guideway when it commences to take its label. The can on leaving the truing device rolls upon the label-bed F, or, to be more accurate, upon the uppermost of a pile of labels carried by the label-bed F, and which are raised automatically as the depth of the pile diminishes.

We shall hereinafter describe in detail the manner and means of keeping the supply of labels ready for the cans; but at this point we assume that a pile of labels is resting upon the bed F and that the cans roll successively over the pile, and we first describe the pasting devices.

Paste is applied to both ends of the label by two similar mechanisms operating together and automatically. These mechanisms are paste-boxes G G, in which are movable paste-belts G′ G′ and oscillating paste-pads G^2 G^2, which work with a tapping movement, which leads us to refer to them as "tappers." The two paste boxes, belts, and tappers are alike, and hence a description of one set will describe both, with the exception that the tappers work toward the label from opposite ends and hence move in opposite directions. In a bracket H of the main frame, Fig. 4, is a short shaft 11, on the end of which is a sprocket H′, connected by a chain H^2 to a sprocket H^3 on the driving-shaft. The shaft 11 has a double crank 12 13, from which rods 14 extend to the rock-shafts 15, which are provided with cranks 16. The tappers are hung from these rock-shafts by links 18, and are also supported by the swinging guide-blocks 19, which fit slots 21 in the tappers. If Figs. 1 and 8 be compared, a very clear idea will be given of the movement of the tapper. At the extremes of its motion it strikes or taps, respectively, the past-belt G′ and the end of the uppermost label, taking from one, upon its pad 20, a surface of paste which it deposits upon the other in time to retreat without interfering with the incoming can. The paste-pad proper is made of cloth, felt, or any other suitable material, mounted upon a strip 121, Figs. 11 and 12. The end of the tapper-arm is provided with holes, through which project pins 22 from the strip 21. A locking-plate 17 is pivoted to the tapper-arm and, by entering slots in pins 22, holds the pad securely in position, and yet allows it to be easily removed. Both ends of the label having received paste, the can, rolling forward, picks up the end of the label, which adheres, and then rolls the remainder of the label around itself until the other pasted end overlaps and also adheres. The can, with its label accurately in position, now passes under a spring-pressure roller 23, Fig. 1, which

bears above and upon the carrying-belt and increases the pressure upon the overlapping pasted edges, it being so placed relatively to the label-bed as to bear upon the overlap of each label passing under it. The labeling is now completed and the can is discharged by a chute I.

We now describe the means for supplying fresh paste continually to the paste-pads, and refer to Figs. 1, 9, and 10 of the drawings. The connecting-rods 14, which operate the shafts of the tapper-arms, give an intermittent motion to the two paste-belts through a pawl-and-ratchet mechanism. Each paste-belt G′ is really a sprocket-belt, because it is rendered non-slipping by means of eyelets 25, formed in the belt, which receive teeth 26 on the guide-rollers 27. On the shaft of the upper roller is a loosely-pivoted arm 28, having a pawl which engages with a ratchet 29, fixed on the roller-shaft. On the connecting-rod 14 are two adjustable collars 30, provided with pins or rollers 31, which, as the connecting-rod reciprocates, respectively strike the arm 28 and cause it to swing in opposite directions. Its effective movement causes the pawl to move the ratchet-wheel and hence the paste-belt, while its opposite or ineffective movement releases the pawl and reëngages it with another tooth of the ratchet-wheel. A holding-pawl 32 keeps the paste-belt stationary during the back stroke of the arm 28. The collars 30 are made adjustable, so as to increase or diminish, as may be desired, the swing of the arm 28 and consequent movement of the paste-belt. An adjustable scraper 33 removes any excess of paste from the belt and causes it to present a perfect, smooth, and uniform surface of paste to the tapper or paste-pad.

We have now to describe the means by which the passage of the can over the label-bed causes the mass of labels to be raised by the thickness of a single label, so that as the labels diminish the cans will continue to receive them accurately and in correct position.

The label-bed F is a plate supported by a hollow stem 35, which slides in bearings 36 in a cross-piece 37 of the main frame. Within this tube is a rod 38, supported by a bracket 39, and a pressure-spring 40 is interposed between the upper ends of the rod and of the tube and within the latter, which tends to force the tubular stem and the label-bed and the pile of labels constantly upward. The movement of the stem is controlled by an automatic brake, which is self-setting, but is released by the passage of the can at a particular part of the label-bed. The brake is a simple shoe 41, pivoted to the main frame and shaped to fit the stem of the label-bed. This shoe is pivoted to one of two toggle-levers 42, which are jointed to a rod 43, extending upward outside the runway, Fig. 4, and forced upwardly by a spring 44, which thus sets the brake, excepting when overcome by pressure from above. Such pressure is afforded by the passage of the can under a roller 45, which in construction and operation will be fully understood by comparing Figs. 1, 3, and 4. The bracket 46, in which the roller is journaled, is swiveled to a lever 47, Fig. 3, which lever extends at right angles to the runway and is pivoted to the upper frame by means of a bracket 48. The outer end of lever 47 is jointed to the brake-rod 43. The roller 45 is above the belt and in contact with it. When the can rolls under the belt at this point, the swiveled roller 45 is raised horizontally by the belt, but the pivoted lever 47 and the brake-rod 43 are depressed, and such movement acting on the toggle releases the stem of the label-bed and permits it to rise during the instant that the can presses the roller 45 upward. As soon as the can has left the roller the spring 44 sets the brake again, the pile of labels having been raised by the thickness of a single label, and the uppermost label being now in proper position to be affixed to the next can. A transverse roller 49 acts as a stop to prevent the labels from rising too far when the brake is released.

As shown in Fig. 5, the can draws the final end of the label under this roller 49, which also acts as a spreader to spread the paste evenly as the pasted surface is drawn under it.

The sides of the pile of labels on the bed are also pressed by the knife-blades 50, Figs. 4 and 6. One knife is held in a slot in the yielding stud 51, which is set in the side piece 1 and is pressed constantly inward by a spring 52. The blades or knives are for the purpose of holding the labels in their place and preventing any but the top one from being pulled out from under the roller 49. The labels being pressed upward against the roller 49 there is a tendency when the top label is pulled out by the revolution of the can to pull out some of the other labels with it, and the knives are situated one on each side of the pile of labels to dig into the labels slightly, and thus prevent any end motion of the labels consequent on the pulling out of the top label. The knives project slightly beyond the sides of the runway. One knife is made stationary and the other yielding, because the labels sometimes vary slightly in width, and the spring-pressure against the stud 51 adjusts itself to the different width of labels.

Fig. 5 shows the operation of the knives with regard to the top label, which is being wrapped around the can. Being raised as it is wrapped around the can, it is higher than the top of the knife, so that the knife cannot affect it in any way as it is drawn out from under the roller 49; but the other labels being lower and lying flat on the label-table the knives hold them and prevent them from being drawn endwise.

Having thus described our invention, what we claim is—

1. In a can-labeling machine, and in combi-

nation, parallel guide-tracks; a movable belt for propelling cans along the guide-tracks; a label-bed between the guide-tracks; means operated by the passage of the can above the label-bed for moving said label-bed upwardly; a swinging cradle, having tangent contacts with the cans, for receiving said cans, truing them under pressure from the belt and delivering them directly upon the label-bed; paste-supply boxes having movable paste-belts; pasting-pads oscillating from opposite directions between the paste-belts and the label-bed, and connected mechanical devices for causing all of such devices to operate, substantially as described.

2. In a labeling-machine, the combination with a guideway, can-feeding devices, a propelling-belt, and a label-bed, of a swinging cradle intermediate between the can-feed and the label-bed, and shaped so as to have tangent contacts with the can, adapted to true the can under pressure from said belt, and to transfer it, so trued directly to the label-bed, substantially as described.

3. In a can-labeling machine, and in combination, a paste-belt having a ratchet mechanism for operating it intermittingly; a label-bed; an oscillating tapper-arm having a paste-pad; a rod connected to the driving-shaft of the machine and to the tapper-arm, and adjustable collars on said rod for operating said ratchet mechanism, substantially as described.

4. In a can-labeling machine, and in combination; a guideway for the cans; a flexible belt for propelling the cans along the same; a label-bed; a spring for forcing such label-bed upward; a self-setting brake for locking the label-bed, and a roller bearing on the propelling-belt and connected to said brake, whereby the pressure of the can under said roller releases the brake and allows the label-bed to move upwardly, substantially as described.

5. In combination with the guideway, the can-propelling belt and the label-bed, having a spring-pressed stem, a brake-lever and shoe, a spring for setting said shoe against the stem, a connecting-rod extending from the brake-lever above the propelling-belt, and a roller bearing on the belt and connected to said rod, substantially as described.

In testimony whereof we have affixed our signatures, in presence of two witnesses, this 27th day of March, 1896.

HENRY S. GRACE.
ARTHUR D. REYNOLDS.

Witnesses:
L. W. SEELY,
GEO. T. KNOX.