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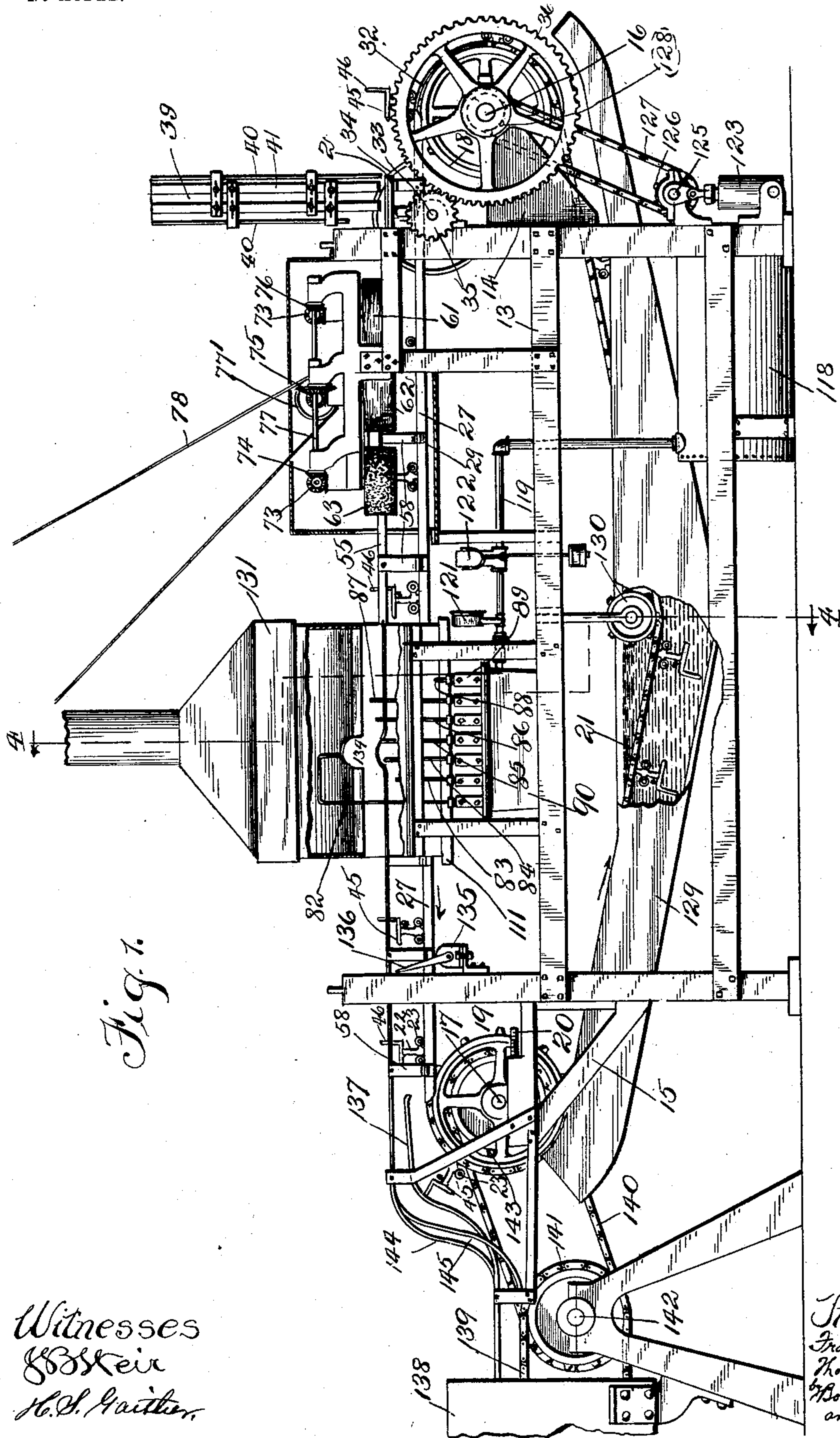
PATENTED MAY 26, 1903.

F. SEJNOHA & T. PERKINS.
APPARATUS FOR PAINTING CANS.

APPLIOATION FILED DEC. 3, 1900.

NO MODEL.

6 SHEETS—SHEET 1.



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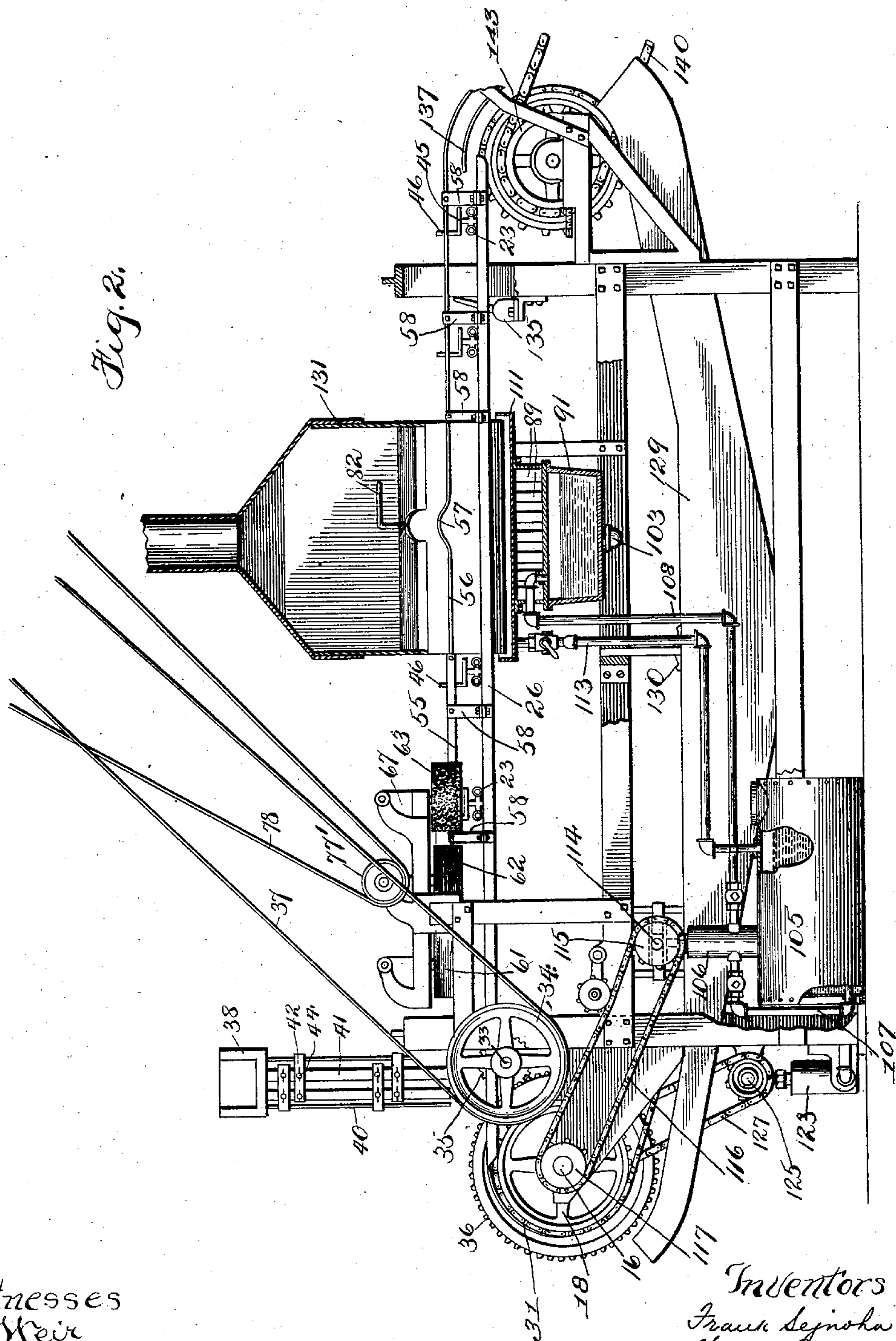
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NO MODEL.

5 SHEETS—SHEET 2.



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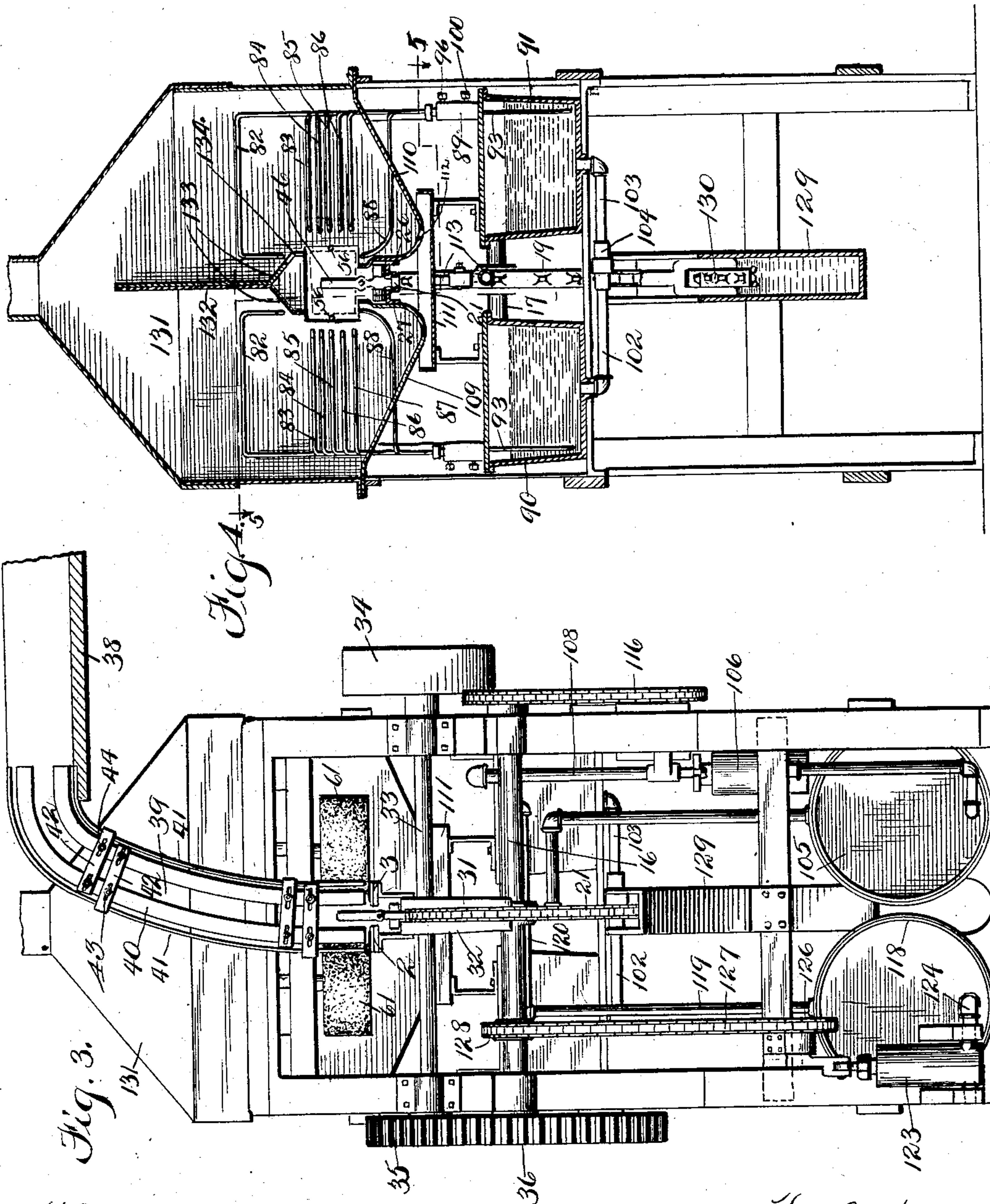
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

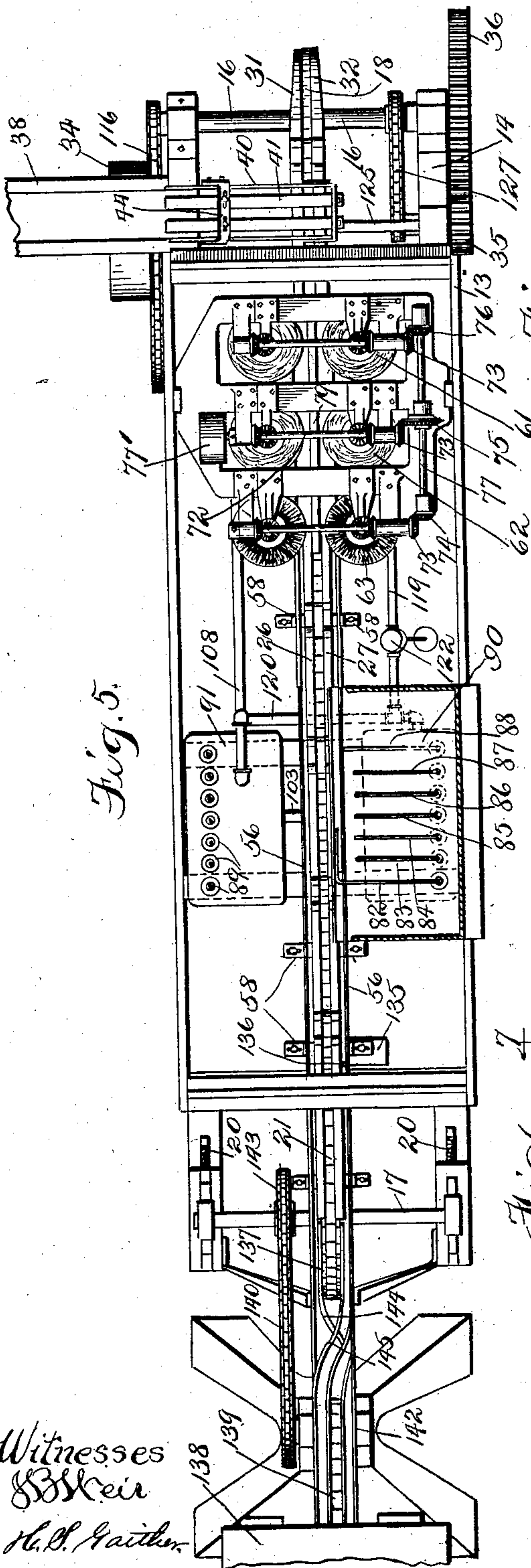


Fig. 5.

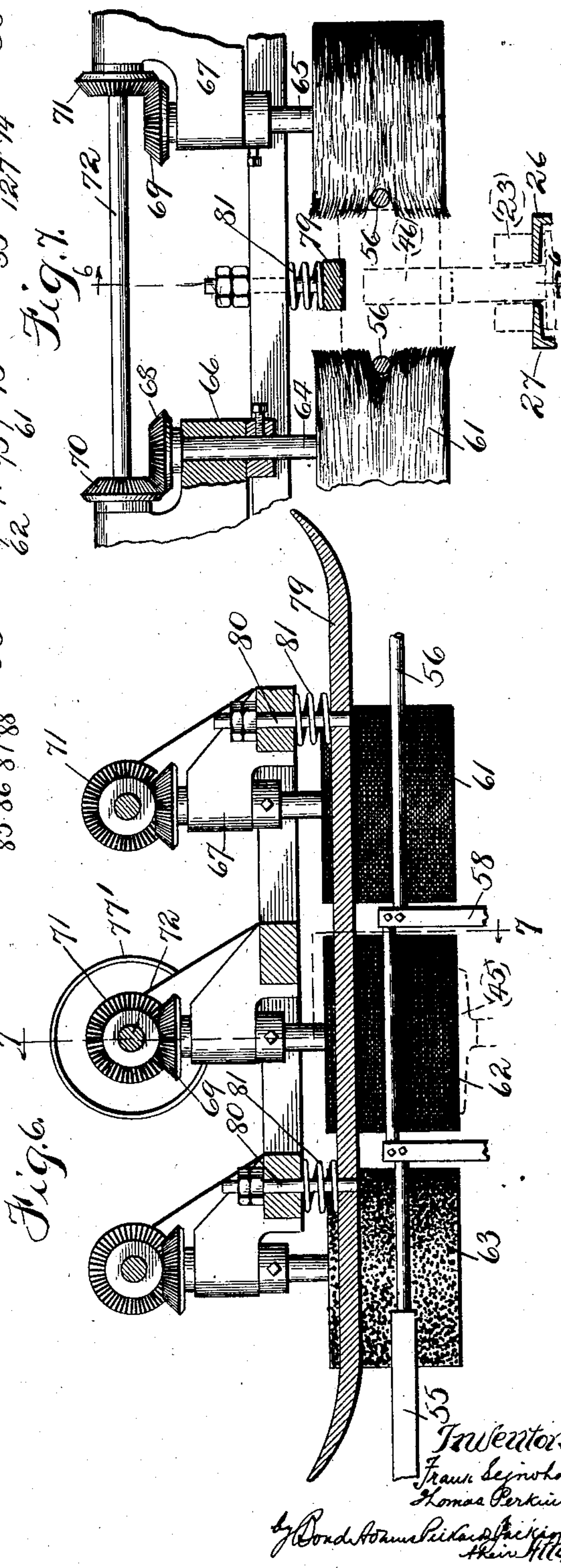


Fig. 6.

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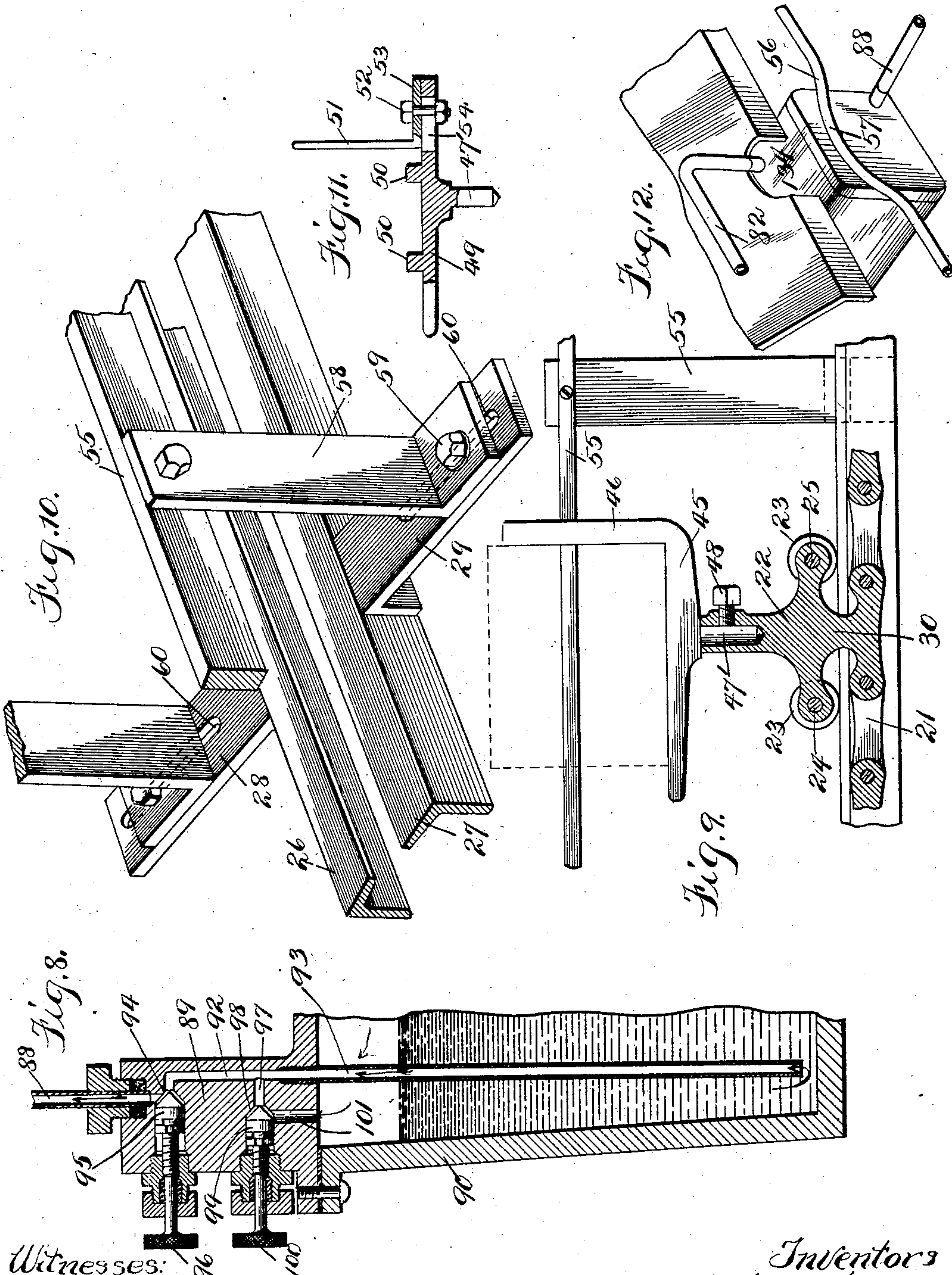
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APPLICATION FILED DEC. 3, 1900.

NO MODEL.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

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TO THEMSELVES, AND CHARLES H. EMERY, OF EASTPORT, MAINE.

APPARATUS FOR PAINTING CANS.

SPECIFICATION forming part of Letters Patent No. 729,512, dated May 26, 1903.

Application filed December 3, 1900. Serial No. 38,538. (No model.)

To all whom it may concern:

Be it known that we, FRANK SEJNOHA and THOMAS PERKINS, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Apparatus for Painting Cans, of which the following is a specification, reference being had to the accompanying drawings.

Our invention relates to machines for painting cans, and has for its object to provide an improved machine for painting the ends of cans preparatory to the application of labels to the bodies of the cans.

To this end our invention consists in an improved construction of machine which operates to take the cans as fed into it and clean the ends to which the paint is to be applied and afterward apply the paint thereto.

It further consists in an improved construction of machine by which the can-carrying devices are cleansed of the paint taken up by them in the operation of painting the cans and means for collecting the paint which escapes from the painting devices and restoring it to the paint-reservoirs from which the painting apparatus receives the paint, thereby automatically replenishing the supply, in improved mechanism for controlling the application of the paint to the cans, and in various other improvements, which will be hereinafter particularly pointed out.

That which we regard as new will be set forth in the claims.

In the accompanying drawings, Figure 1 is a side elevation of our improved machine, some parts being in section. Fig. 2 is a side elevation, some parts being in section, illustrating the opposite side of the machine from that shown in Fig. 1. Fig. 3 is an end view illustrating the inlet end of the machine. Fig. 4 is a vertical cross-section on line 4 4 of Fig. 1. Fig. 5 is a plan view, some parts being in section. Fig. 6 is an enlarged detail, being a vertical section on line 6 6 of Fig. 7. Fig. 7 is an enlarged detail, being a cross-section on line 7 7 of Fig. 6. Fig. 8 is an enlarged detail, being a vertical section through the valves which control the paint-supply and one of the paint reservoirs. Fig. 9 is a longitudinal section of a part of the

carrier, illustrating also the can-support and some parts of the frame. Fig. 10 is a perspective view of a part of the carrying-frame. Fig. 11 is a detail, partly in section, illustrating a modified form of can-support; and Fig. 12 is a perspective view illustrating a part of the painting apparatus.

Referring to the drawings, 13 indicates the frame of the machine, which is of suitable shape to support the various parts of the apparatus. At the ends of the frame are brackets 14 15, which carry shafts 16 17, respectively, on which are mounted sprocket-wheels 18 19, respectively, as shown in Fig. 1. The shaft 17 is mounted in bearings adjustable by adjusting-screws 20 to vary the distance between the sprocket-wheels 18 19.

21 indicates a belt mounted on the sprocket-wheels 18 19 and forming a carrier to carry the cans through the machine. The construction of the belt 21 is best shown in Fig. 9, from an inspection of which it will be seen that said belt carries trolleys 22, the wheels 23 of which are arranged in tandem pairs on shafts 24 25 and are adapted to run on rails 26 27, supported by bars 28 29, respectively, which project inward from the frame at suitable intervals. The rails 26 27 are formed of angle-irons, one of the webs of each being arranged horizontally to form the track. Said rails are spaced apart a suitable distance to permit of the passage of the shank 30 of the trolley, as shown in Figs. 9 and 10. The rails 26 27 extend from the sprocket-wheel 18 to the sprocket-wheel 19 and lie slightly higher than the upper surfaces of said wheels.

At the inlet end of the machine there are guides 31 32, which form extensions of the rails 26 27 and extend partly around the sprocket-wheel 18. The lower ends of said guides lie closer to the sprocket-wheels than their upper ends to insure that the wheels 23 shall be properly mounted on said guides as the carrier moves. Similar guides may, if desired, be used at the outlet end of the machine; but they are not essential, and are usually omitted at that point.

The can-carrying devices are operated from a drive-shaft 33, mounted in suitable bearings at the inlet end of the machine, and provided at one end with a pulley 34, adapted

to receive a belt, and at the other end with a pinion 35, which meshes with a gear 36, mounted upon one end of the shaft 16, as best shown in Figs. 1 and 3. By this construction when the shaft 33 is rotated the chain 21 is moved in the direction indicated by the arrows in Fig. 1. The pulley 34 may be connected by a belt 37 to a suitable drive-shaft having fast and loose pulleys, with belt-shifting mechanism, so that the machine may be stopped and started at pleasure.

38 indicates a table on which the cans to be painted are placed prior to being fed into the machine. (See Fig. 3.)

39 indicates a chute through which the cans are fed from the table 38 to the carrier. The chute 39 is composed of fixed bars 40 and adjustable bars 41, arranged at right angles to the bars 40 and secured thereto by straps 42, as shown in Fig. 3, the object being to provide for adjusting the size of the chute to receive cans of various sizes. The straps 42 are provided with slots 43, through which pass bolts 44, so that by loosening the bolts 44 the bars 41 may be adjusted at pleasure. The lower end of the chute 39 terminates immediately above can-supporting bars 2 3, arranged above the rails 26 27, as shown in Fig. 3, and to permit the cans to pass out of the chute the inside bars 40 of the chute are cut off a sufficient distance above said can-supporting bars 2 3 to permit of the passage of the cans, as shown in Fig. 1. When the cans fall through the chute 39, therefore, they are deposited upon the bars 2 3 in position to be taken up by the carrier, as hereinafter described.

For the purpose of carrying the cans through the machine each of the trolleys 22 is provided with a can-holding device adapted to receive and support a can. The can-holding device used for square cans is shown in Fig. 9, and consists of a horizontal plate 45, having an upright arm 46, the whole forming a rectangular support, the arm 46 extending along the rear side of the can as it is carried along. The can-holding device is provided with a downwardly-projecting pivot-pin 47', which fits into a socket in the trolley 22, and is secured in place by a set-screw 48, making it readily removable.

In Fig. 11 is shown a can-supporting device intended for use with round cans. In the construction there shown there is a horizontal plate 49, having a downwardly-projecting pin 47'. On its upper surface the plate 49 is provided with parallel strips 50, spaced a short distance apart, between which the round can rests on its side. It is also provided with a vertically-extending bar 51, secured thereto by a bolt 52, which extends through a flange 53, carried by said bar, and through a slot 54 in the plate 49. By this construction the bar 51 is adjustable to fit cans of different diameters. In operation it bears against the rear surface of the can, pre-

venting it from getting out of place as it is carried through the machine.

To prevent the cans from moving endwise out of place as they are carried through the machine, guide-bars 55 are provided, which extend from one end of the machine to the other over the rails 26 27, respectively, at a suitable height so that they extend across the ends of the cans. Preferably that part of the guide-bars 55 which extends through the painting apparatus is rounded, as shown at 56 in Fig. 2, and each bar is provided at a suitable point with an offset portion 57, the object of which will be hereinafter set forth. The guide-bars 55 are supported at suitable intervals by straps 58, secured to the frame of the machine, as best shown in Figs. 2 and 10. The position of the guide-bars 55 with reference to the can is shown in Fig. 9, where the can is indicated in dotted lines. The position of the offset portion 57 of the guide-bars with reference to the can is illustrated in Fig. 12, in which it is illustrated in connection with a can. For the purpose of adjusting the guide-bars 55 to suit cans of different lengths the straps 58 are adjustably secured to the frame of the machine by bolts 59, which pass through slots 60 in the supports 28 29, on which they are carried, as shown in Fig. 10.

From the foregoing description it will be understood that the cans are fed into the machine through the chute 39, by which they are deposited on the bars 2 3, and are then taken up by the can-supporting devices, resting on the plates 45 thereof, and are carried through the machine, their ends being kept in line by the bars 55, the can-supporting devices being supported by the trolleys 22, the wheels of which run on the rails 26 27. Soon after the cans are taken up by the can-carrying devices they are carried between and cleansed by a series of brushes 61 62 63, arranged in pairs, one of each pair being over the rail 26 and the other of each pair being over the rail 27, as shown in Fig. 5. The brushes 61 62 are preferably made of thin disks of cloth, while the brushes 63 are of bristles, but the material of which said brushes are made may vary to suit varying conditions. The brushes 61 are mounted to rotate in more or less horizontal planes, and to this end they are fitted upon the lower ends of shafts 64 65, the shaft 64 being at one side of the machine and the shaft 65 at the other side thereof, as shown in Fig. 7. Said shafts are supported in suitable brackets 66 67, respectively, and are provided at their upper ends, respectively, with beveled gears 68 69, which mesh with beveled gears 70 71, respectively, carried by a horizontal shaft 72, as shown in Figs. 5 and 7. There are three of the shafts 72, each carrying the beveled gears 70 71 and also a beveled gear 73. The different beveled gears 73 are secured to the ends of their respective shafts and mesh with beveled gears 74 75 76, mounted upon a counter-shaft 77, suitably supported in the

frame of the machine, as shown in Fig. 5. By this construction the different brushes are all geared together, and by rotating any one of the shafts 72 all the brushes may be rotated.

- 5 As shown in Figs. 5 and 7, the gearing above described is arranged so that the brushes at one side of the machine rotate oppositely to the brushes at the other side, and all said brushes are rotated so that the edges thereof which engage the cans move oppositely to the cans, thereby securing more effective action. As illustrated in Fig. 5, the intermediate shaft 72 carries a pulley 77', from which the different brushes are rotated.
- 15 A belt 78 runs around the pulley 77' and is connected by suitable fast and loose pulley mechanism with the main drive-shaft, which drives the belt 37, or with any other suitable source of power. As illustrated in Fig. 7, the operating-surface of each of the brushes 61 62 63 is broad enough to extend over the ends of the cans so that they are thoroughly cleansed. Furthermore, the brushes are placed somewhat closer together than the
- 25 length of the cans, so that the brushes project a short distance over the sides of the cans, and consequently act to cleanse such portions of the cans also.

- In Figs. 6 and 7 we have illustrated the
- 30 guide-bars 55 as being rounded where they extend between the different brushes and as having also an offset portion opposite the brushes 62. The object of this arrangement is to insure the cleansing of the cans at all
- 35 points and to prevent the guide-bars from interfering with such cleansing, as by making the offset shown that part of the cans which is protected by the other portions of the bars 55 is exposed to the action of the
- 40 brushes when the offset portion of said bars is reached.

- In order to prevent the brushes from disarranging the cans, a presser-bar 79 is provided, which extends between the brushes
- 45 over the path of the cans, as shown in Fig. 7, and is adapted to bear down upon them as they are carried between the brushes. Said presser-bar 79 is supported by rods 80, secured in the frame of the machine, and springs 81
- 50 are provided between the frame of the machine and the bar 79, which act to hold the presser-bar 79 yieldingly in contact with the cans as they are carried along.

- After passing the brushes the cans are
- 55 carried to the paint-applying mechanism, by which paint is applied to their ends and to their sides near the ends, the object being to paint so much of the cans as is not covered by the labels usually attached. The paint-
- 60 applying devices are arranged between the brushes 61 62 63 and the outlet end of the machine, and consist of two sets of paint-spraying tubes, one set being at each side of the machine, the two sets being arranged to
- 65 discharge in opposite directions, so that as the can is carried between them the paint is applied to its ends. As illustrated in the draw-

ings, at each side of the machine there are seven paint-tubes, numbered, respectively, 82 83 84 85 86 87 88. The uppermost tube 82, at each side of the machine has its inner end turned downward, as shown in Fig. 4, and extends inward far enough so that it is adapted to discharge upon the side of the can near the end. Similarly the lowermost tube 88 at each side of the machine has its inner end bent upward and is adapted to discharge the paint similarly to the tube 82. The intermediate tubes 83 84 85 86 87 are arranged at different levels and discharge against the ends of the can. This is best shown in Figs. 1 and 4. Each of said tubes is secured at its lower end in a valve-casing 89, the valve-casings at the opposite sides of the machine being secured, respectively, on paint-tanks 90 91. Each of said valve-casings is provided with seven passages 92, each of which at its lower end communicates with a tube 93, extending into the paint-tank and terminating near the bottom thereof, as shown in Fig. 8. Each of said passages also is provided near its upper end with a valve-seat 94, adapted to receive a needle-valve 95, operated by a hand-wheel 96, as shown. Above each valve-seat 94 is secured one of the paint-tubes, so that when one of the valves 95 is open paint may flow through the passage 92, controlled by it, to the paint-tube above it. Each of said passages 92 also communicates with a passage 97, leading to a valve-seat 98, against which is seated an air-valve 99, controlled by a wheel 100. The valve-chamber in which the valve 99 is seated communicates directly with the paint-tank below it through an air-passage 101, preferably arranged at right angles to the passages 97, as shown in Fig. 8. By this arrangement air may be admitted from the paint-tank to the passage 92, leading to any of the paint-tubes, by opening the valve 99. As will hereinafter appear, compressed air is supplied to the paint-tanks 90 91 above the paint therein and by its downward pressure on the paint therein forces the paint up through the tubes 93 into passages 92; and when the valves 95 are opened the paint is caused to pass up through the different paint-tubes and to be discharged through the nozzles thereof upon the can. At the same time when the valves 99 are open compressed air passes directly from the tanks 90 91 into the passages 92 and thence passes up through the passages 92 and paint-tubes, being discharged with the paint and serving to atomize or spray it as it is applied to the cans.

It will be understood that the nozzles of the paint-tubes are of any suitable construction. In practice we have found that a nozzle having simply a fine orifice to discharge the paint is most satisfactory.

As illustrated in Fig. 4, the paint-tanks 90 91 are arranged at opposite sides of the can-carrier and at a somewhat lower level, being supported upon the frame of the machine. In order to equalize the level of the paint in

the two tanks, they are provided with tubes 102 103, the tube 102 opening into the bottom of the tank 90 and the tube 103 opening into the bottom of the tank 91, and said tubes are
 5 connected by a coupling 104, into which they telescope, as shown in Fig. 4. The coupling 104 fits tightly on the ends of the tubes 102 103 and prevents escape of the paint from said tubes; but it is not so tight as to prevent
 10 movement of said tubes therein. By this construction the level of the paint in the two tanks is always the same, and by providing the telescopic coupling, as above described, the paint-tanks may be moved toward or from
 15 each other as may be necessary to adjust the different paint-tubes to suit cans of different lengths.

Paint is supplied to the tanks 90 91 from a reservoir 105, preferably placed under the machine, as shown in Fig. 2, and at one side thereof. Said reservoir is provided with a
 20 pump 106, communicating with the lower portion thereof by a pipe 107 and with the tank 91 by a pipe 108, as shown in Fig. 2. By this construction by operating the pump 106 paint may be forced from the reservoir 105 into the tank 91, so that any desired depth of paint may be maintained in the two paint-tanks. Surplus paint escaping from the paint-tubes
 30 or dripping from the cans is caught by pans 109 110, which extend under the paint-tubes and terminate close under the ends of the cans, and conducted to a drip-pan 111, which extends under the lower portions of said pans 109 110 and receives the paint from them, the pans 109 110 being provided with openings 112 for the discharge of the paint into the pan 111. A pipe 113 is connected with the pan 111 and discharges into the upper portion of the reservoir 105, so that the paint accumulating in said pan is conducted back to the reservoir. The pump 106 is driven from a shaft 114, which carries a sprocket-wheel 115, connected by a link-belt 116, with a sprocket-wheel 117, mounted on the shaft 16.
 40

Compressed air is supplied to the paint-tanks 90 91 above the paint from a compressed-air reservoir 118, preferably placed beside the reservoir 105, as shown in Fig. 3. The reservoir 118 communicates with the paint-tank 90
 50 by means of a pipe 119 and with the tank 91 through a branch pipe 120, which communicates with the pipe 119, as shown in Figs. 3 and 5. The pipe 119 is provided with a gage 121, by which the pressure may be observed, and with a controlling-valve 122, by which the pressure is automatically regulated. The valve 122 may be of any suitable construction. The reservoir 118 is supplied with compressed air by means of a pump 123, which communicates therewith through a pipe 124 and is operated by a shaft 125, provided with a sprocket-wheel 126, which is driven by a link-belt 127, which runs over a sprocket-wheel 128, mounted on the shaft 16.
 60

As shown in Figs. 1, 3, and 4, a tank 129 is provided which extends through the lower

part of the frame of the machine in the path of the carrier-chain 21, so that the lower portion of said chain moves through said tank, 70 and, as shown in Fig. 1, an idler 130 is provided, which projects down into said tank 129 and engages the carrier-chain 21, so as to hold it down in said tank. The tank 129 is filled with turpentine or some other suitable 75 solvent of paint, so that the carrier-chain is immersed in the turpentine and is cleansed of paint accumulated during its passage through the painting apparatus. By this arrangement the can-holding devices and the 80 chain are prevented from accumulating any considerable amount of paint and are always clean when they take the cans.

In order to prevent the escape of paint and to protect the other parts of the machine, the 85 painting devices are inclosed by a hood 131, which is provided with sides and ends which inclose the paint-tubes. The drip-pans 109 110 are connected at their outer ends with the hood 131, forming the bottom thereof, so 90 that the painting devices are entirely inclosed except for the narrow space provided for the passage of the cans. In order to protect the bodies of the cans except near their ends, a central partition 132 is provided, extending 95 longitudinally of the hood 131, which partition is bifurcated at its lower edge, forming an inner hood 133, which extends longitudinally over the bodies of the cans. Immediately under the nozzles of the upper 10 tubes 82 the inner hood 133 is cut away, as shown at 134 in Figs. 1 and 4, to permit the paint from said tubes to be applied to the sides of the cans near their ends.

After passing through the painting apparatus the cans are carried past a counting 105 device 135 of any suitable description, provided with a lever 136, which projects upward into the path of the cans, so that as each can passes it strikes said lever and rocks 110 it, operating the counting device. The cans are then discharged from the can-supporting devices upon rails 137, which are arranged to intercept said cans near the sprocket-wheel 19, as shown in Figs. 1 and 5. Said rails are 115 spaced apart sufficiently to permit the trolleys 22 to pass between them and are slightly below the level of the horizontal bar 45 of the can-supporting devices, so that as the cans are carried along they are transferred to said 120 rails 137, the trolleys passing down around the sprocket-wheel 19, as illustrated in Fig. 1. The rails 137 are inclined downward, so that when the cans are delivered upon them they slide downward toward a drying apparatus 138, arranged adjacent to the end of the 125 painting apparatus. The drying apparatus is provided with an endless belt 139, upon which the cans are delivered by the rails 137 and carried through it, said belt being driven 130 from the shaft 17 by means of a link belt 140, which is mounted on a sprocket-wheel 141, carried by a shaft 142, which also drives the endless belt 139, the link-belt 140 being

also mounted on a sprocket-wheel 143, mounted on the shaft 17, as shown in Figs. 1 and 5. Before being discharged on the endless belt 139 the cans which rested on their sides while being carried through the painting apparatus are turned on end by means of inclined rods 144 145, as shown in Fig. 1.

From the foregoing description it will be seen that as the cans are fed into the chute 39 they are taken by the carrier and conducted between the brushes 61 62 63, where the parts to which the paint is to be applied are thoroughly scoured, after which the cans are conducted through the painting apparatus, where the paint is applied to their ends and to their sides near the ends, the cans then being counted and discharged to the drying apparatus. During this operation the supply of paint in the tanks to which the paint-tubes are connected is replenished from the reservoir 105 and the compressed air by which the atomizers or spraying devices are operated is supplied from the reservoir 118. If it is desired to vary the operation of the paint-tubes, this may be accomplished by adjusting the valves 96 and 100. By closing the valve 96 the operation of any desired paint-tube may be stopped without affecting the others, and by adjusting the valve 100 the supply of air furnished to any paint-tube may be regulated. We thus provide for controlling the operation of each paint-tube accurately, so that the distribution of paint as applied to the cans may be adjusted as desired.

It will be understood that while we prefer to use seven paint-tubes, as illustrated, the number of such tubes used depends on circumstances, and our invention is not limited to any particular number of tubes. It will be understood, further, that our invention is not limited to the specific details of the construction described and shown, except in so far as such specific details are particularly claimed.

That which we claim as our invention, and desire to secure by Letters Patent, is—

1. In a can-painting machine, the combination of a carrier adapted to conduct the cans through the machine, paint-spraying devices for applying paint to the cans, means protecting the body portions of the cans from paint except near their ends, and means for cleaning the cans before the paint is applied thereto, substantially as described.

2. In a can-painting machine, the combination of a carrier, can-holding devices carried by said carrier, paint-applying devices, means protecting the body portions of the cans from paint except near their ends, and guides for the ends of the cans, substantially as described.

3. In a can-painting machine, the combination of a carrier, can-holding devices carried by said carrier, paint-applying devices, means protecting the body portions of the cans from paint except near their ends, guides for the ends of the cans, and cleaning-

brushes acting on the cans before they are conducted to the painting devices, substantially as described.

4. In a can-painting machine, the combination of a carrier, paint-applying devices at opposite sides of the machine, paint-tanks at opposite sides of the machine, with which said paint-applying devices communicate, and means for conducting paint from the lower portion of one of said tanks to the lower portion of the other, for equalizing the level of paint in said tanks, substantially as described.

5. In a can-painting machine, the combination of a carrier, can-holding devices carried by said carrier, paint-applying devices, and guide-rods for the ends of the cans, said guide-rods having offset portions, whereby all portions of the ends of the cans will be exposed, substantially as described.

6. In a can-painting machine, the combination of a carrier, can-holding devices carried by said carrier, paint-applying devices, guide-rods for the ends of the cans, said guide-rods having offset portions, whereby all portions of the ends of the cans will be exposed, and cleaning-brushes acting on the cans before they are conducted to the painting devices, substantially as described.

7. In a can-painting machine, the combination of a carrier consisting of an endless belt, can-holding devices carried thereby, each of said can-holding devices consisting of a horizontal and an upright bar, a presser-bar adapted to engage said cans to hold them in position, paint-applying devices, and means for cleaning the cans before they are conducted to the paint-applying devices, substantially as described.

8. In a can-painting machine, the combination of a carrier, paint-applying devices at opposite sides of the machine, paint-tanks at opposite sides of the machine with which said paint-applying devices communicate, and means for equalizing the level of the paint in said tanks, substantially as described.

9. In a can-painting machine, the combination of a carrier, paint-applying devices, a paint-reservoir, compressed-air apparatus for operating the paint-applying devices, a paint-tank with which said paint-applying devices communicate, and means for forcing paint from said reservoir to said paint-tank, substantially as described.

10. In a can-painting machine, the combination of a carrier, paint-applying devices, a paint-reservoir, compressed-air apparatus for operating the paint-applying devices, a paint-tank with which said paint-applying devices communicate, and a pump for forcing paint from said reservoir to said paint-tank, substantially as described.

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