July 12, 1938. J. BAHELKA 2,123,594

JAR CLEANING MACHINE

Filed Jan. 21, 1933 6 Sheets-Sheet 1

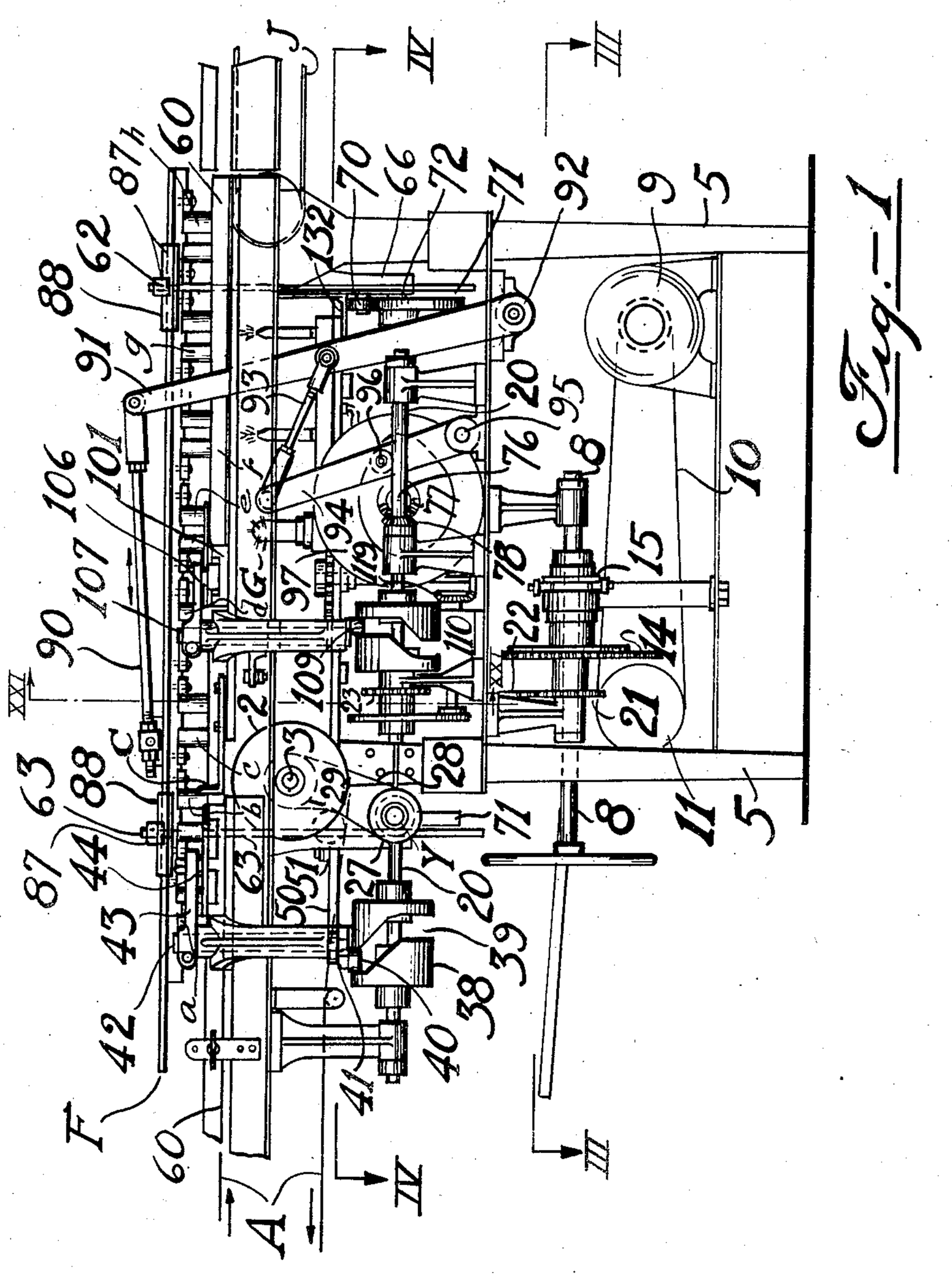

Fig.-1

Joseph Bahelka Inventor.

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W. E. Currie

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JAR CLEANING MACHINE

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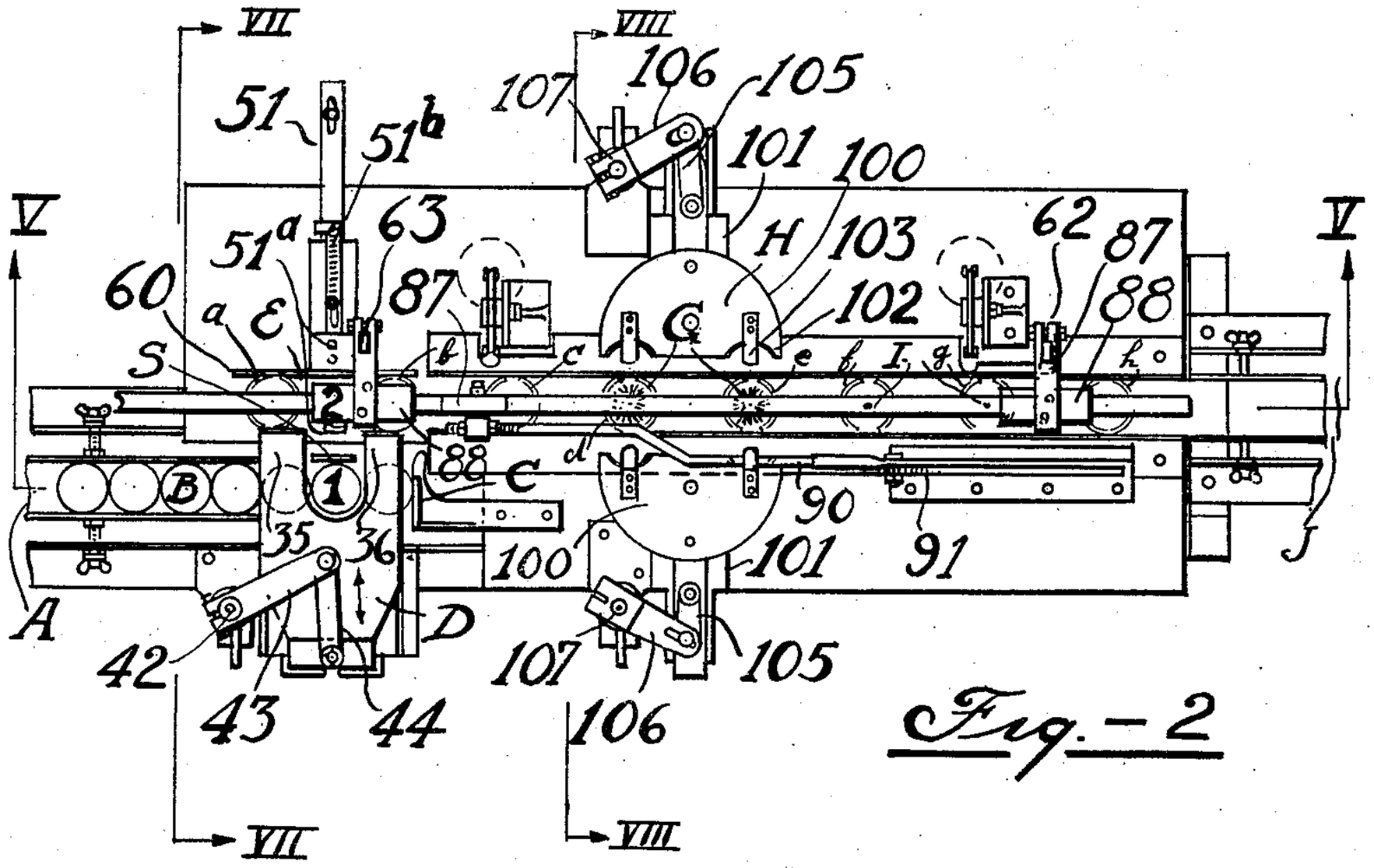

Fig. – 2

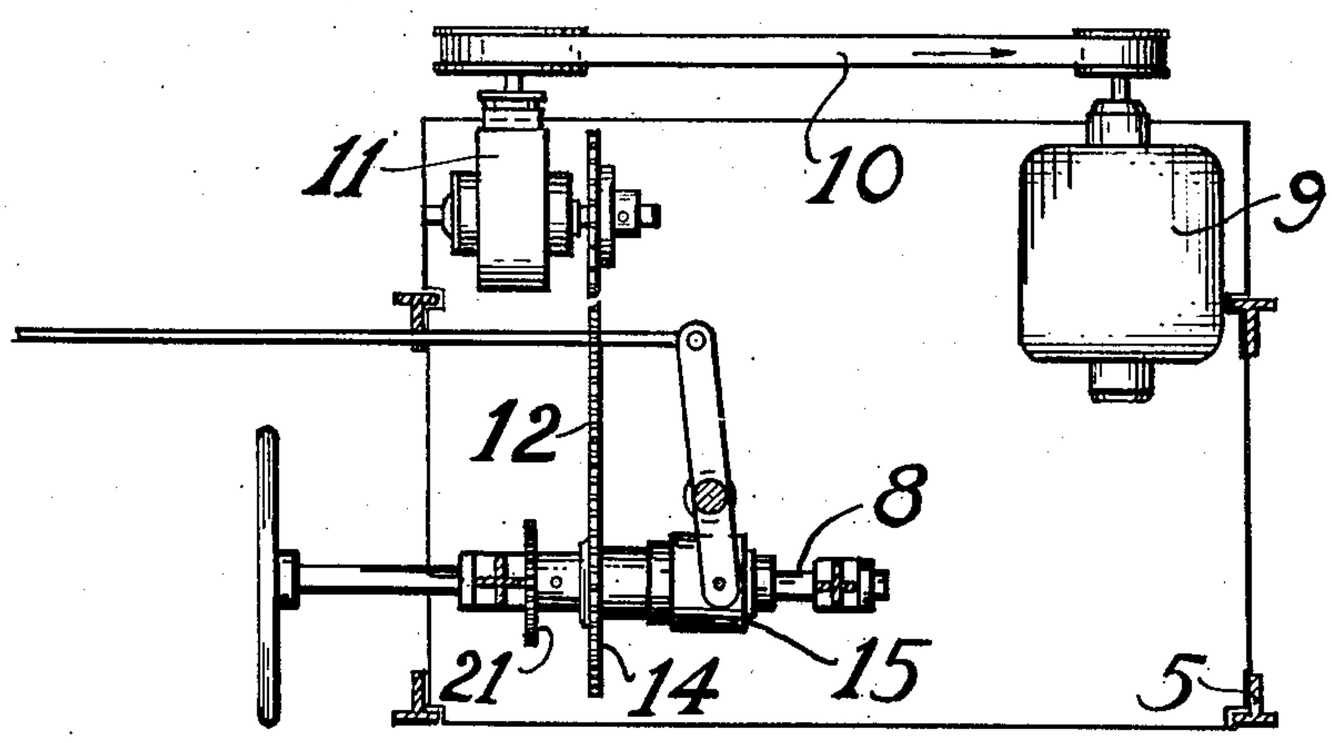

Fig – 3

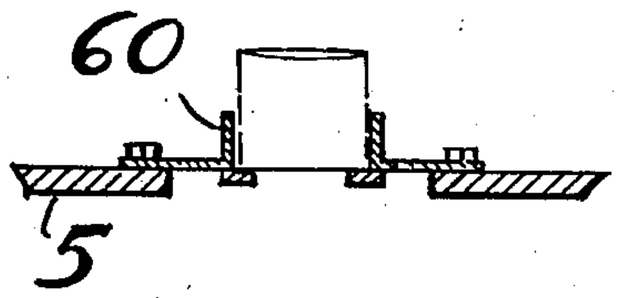

Fig. – 9.

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JAR CLEANING MACHINE

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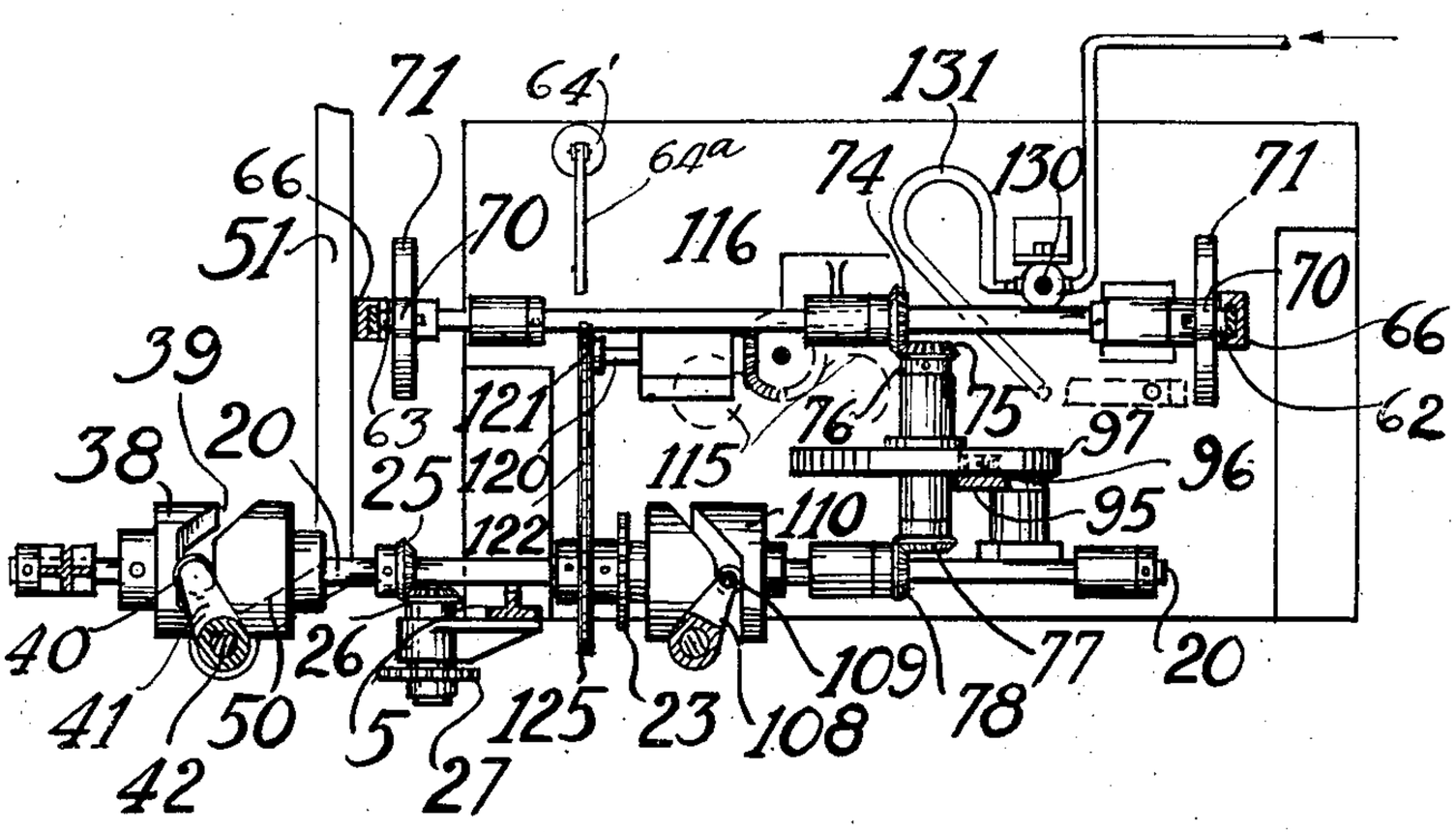

Fig.—4

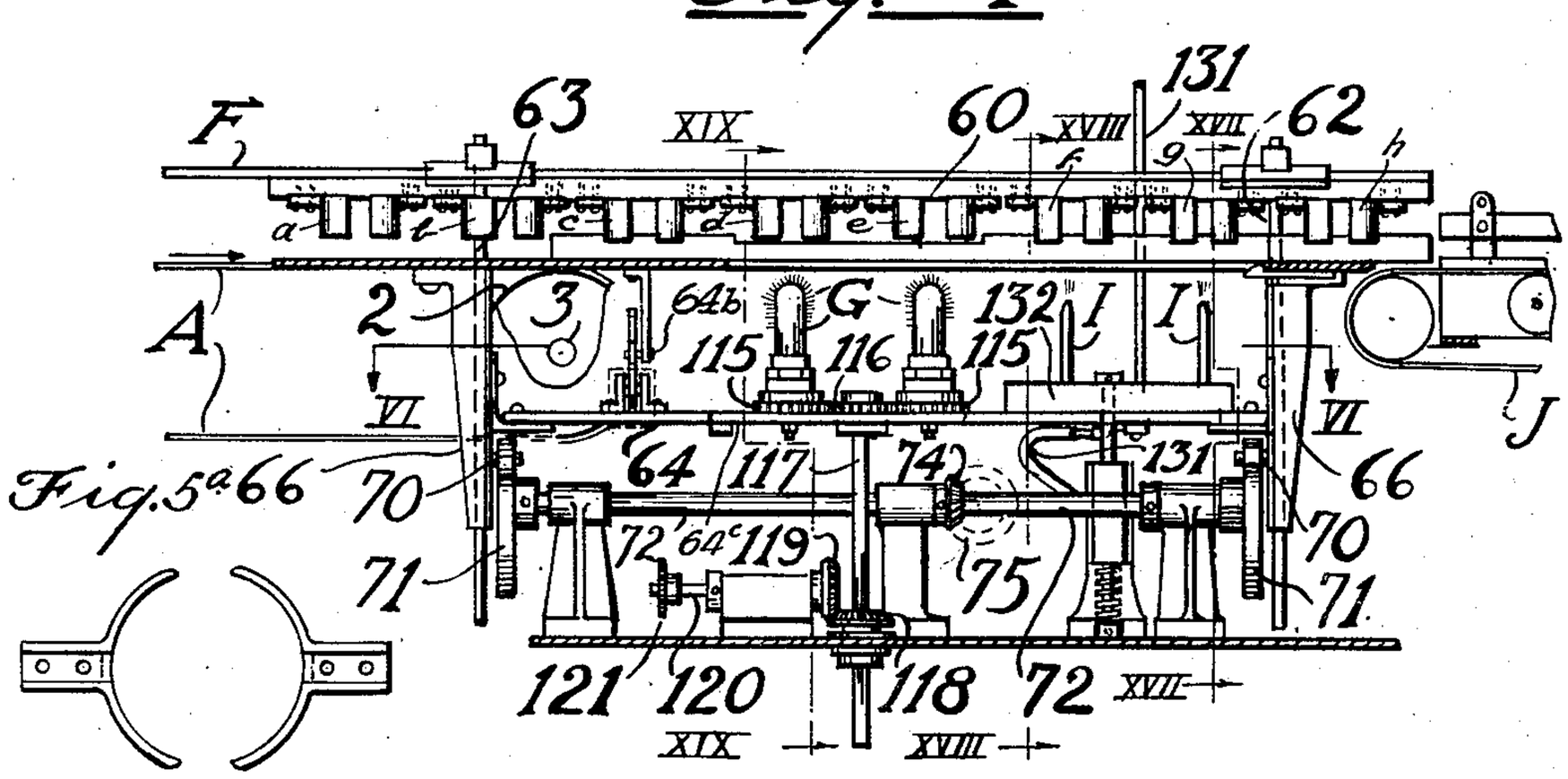

Fig. 5a

Fig. 5b

Fig.—5

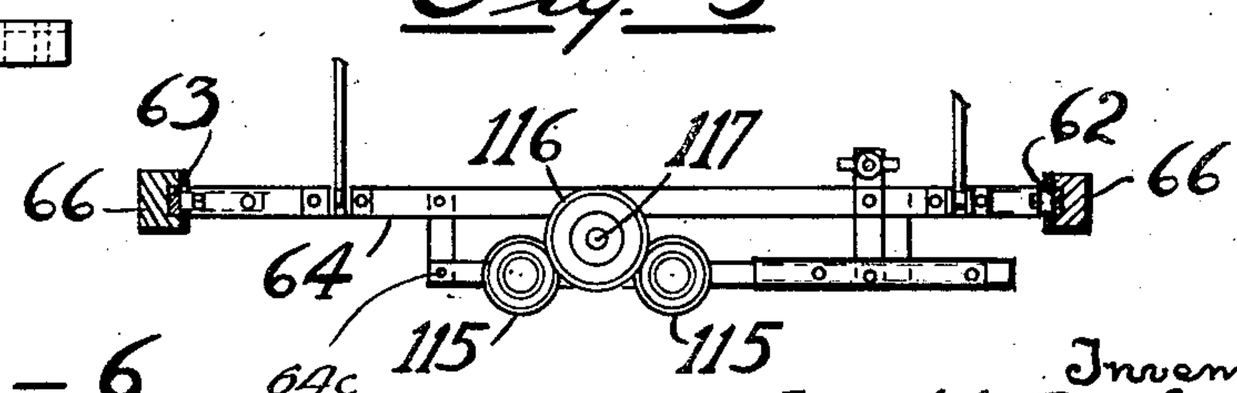

Fig.—6

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Fig. 16.

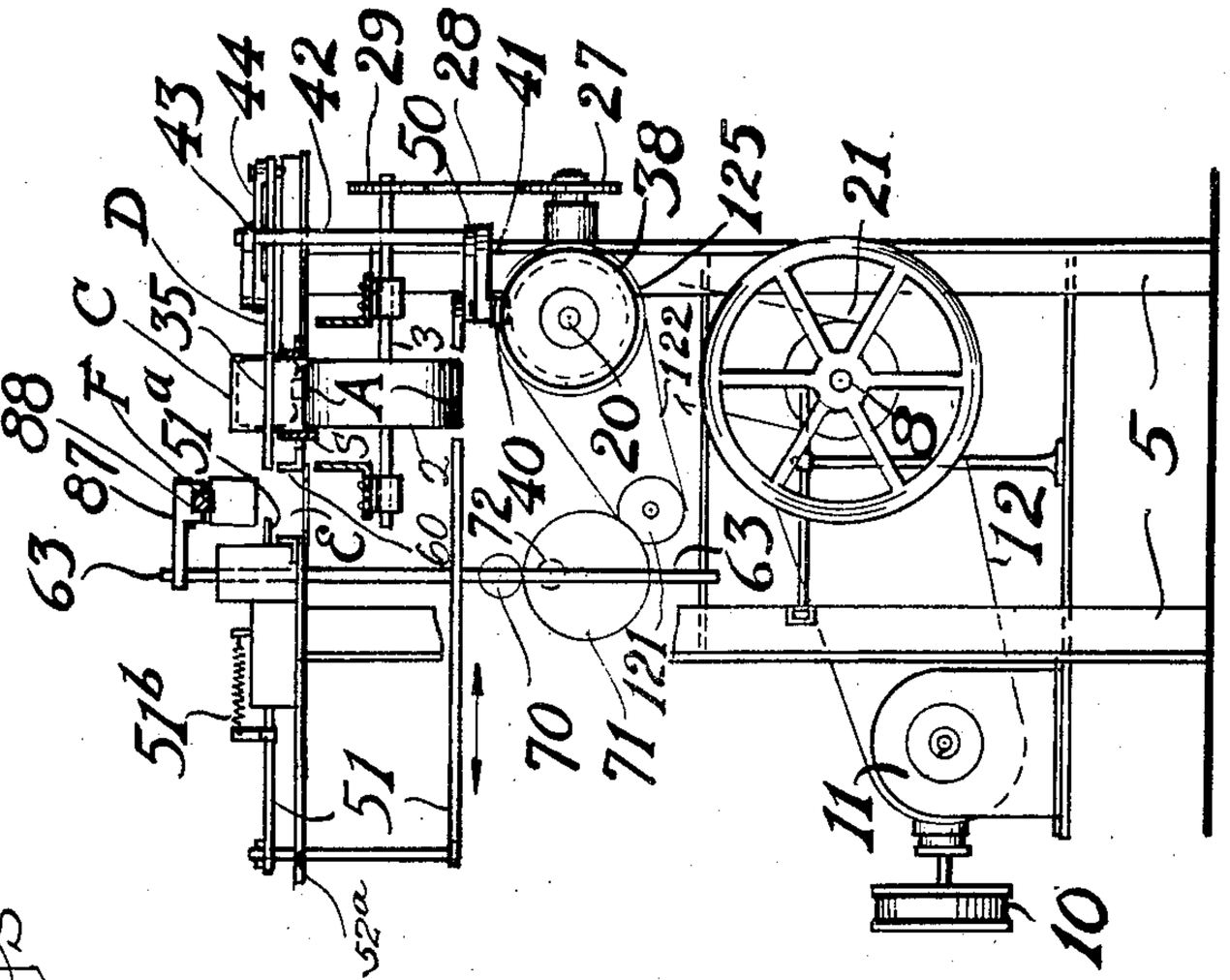

Fig. 7

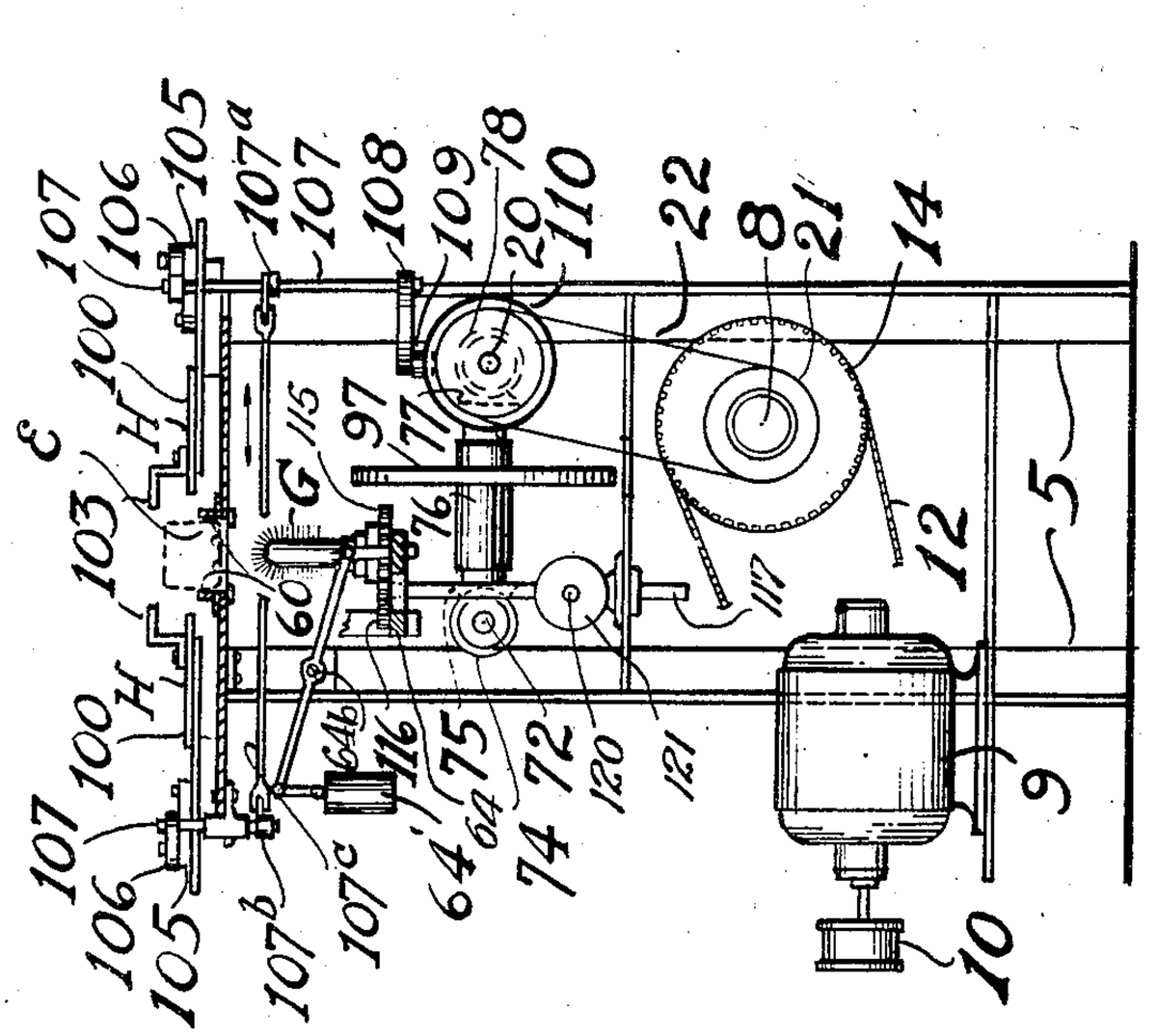

Fig. 8

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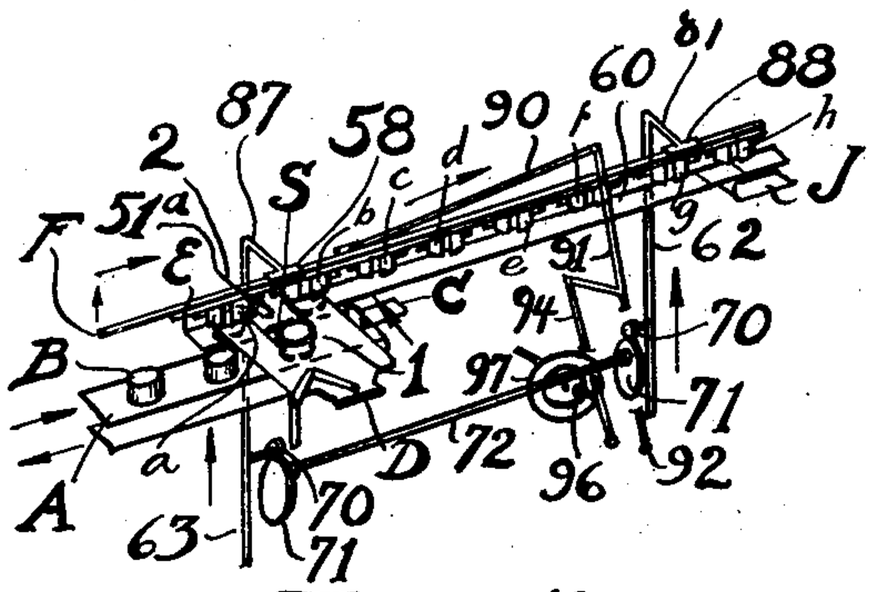

Fig. — 10.

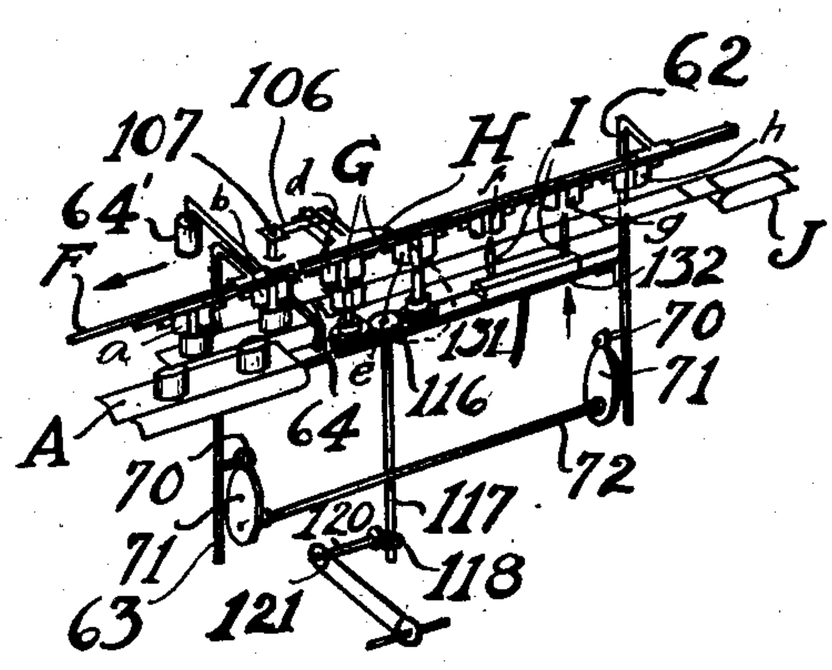

Fig. — 12.

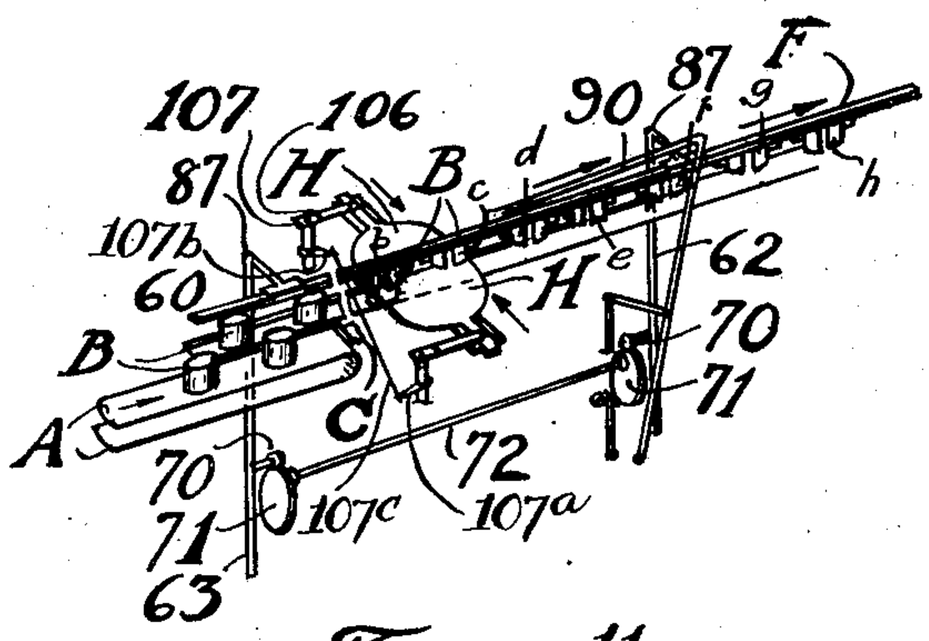

Fig. — 11.

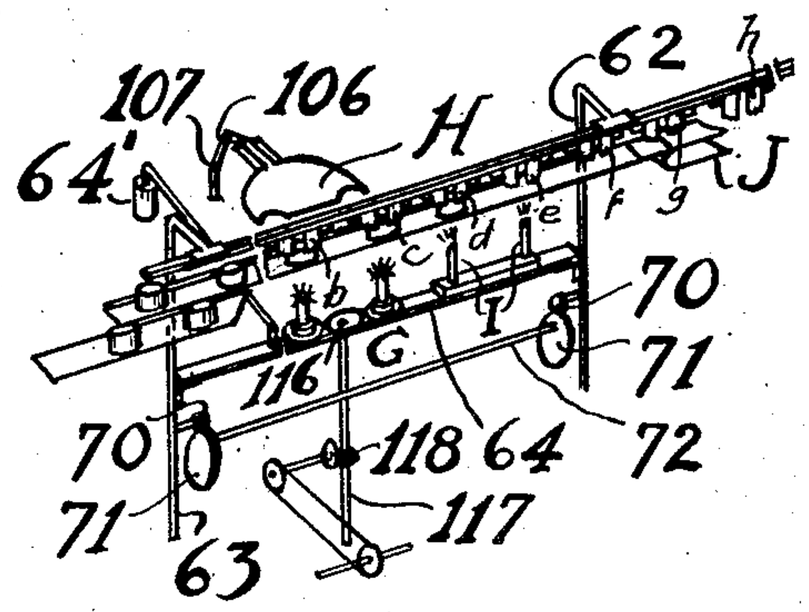

Fig. — 13

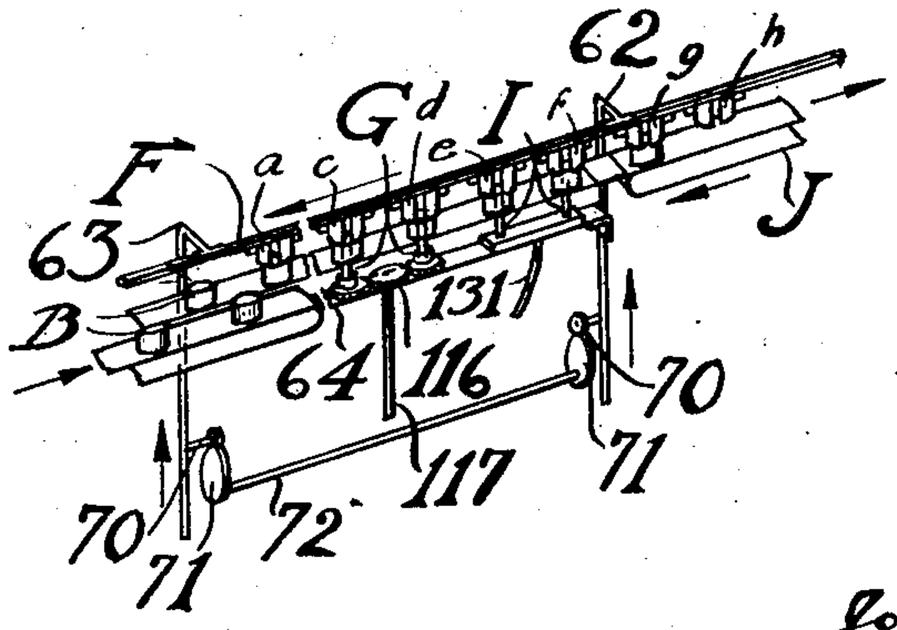

Fig. — 15.

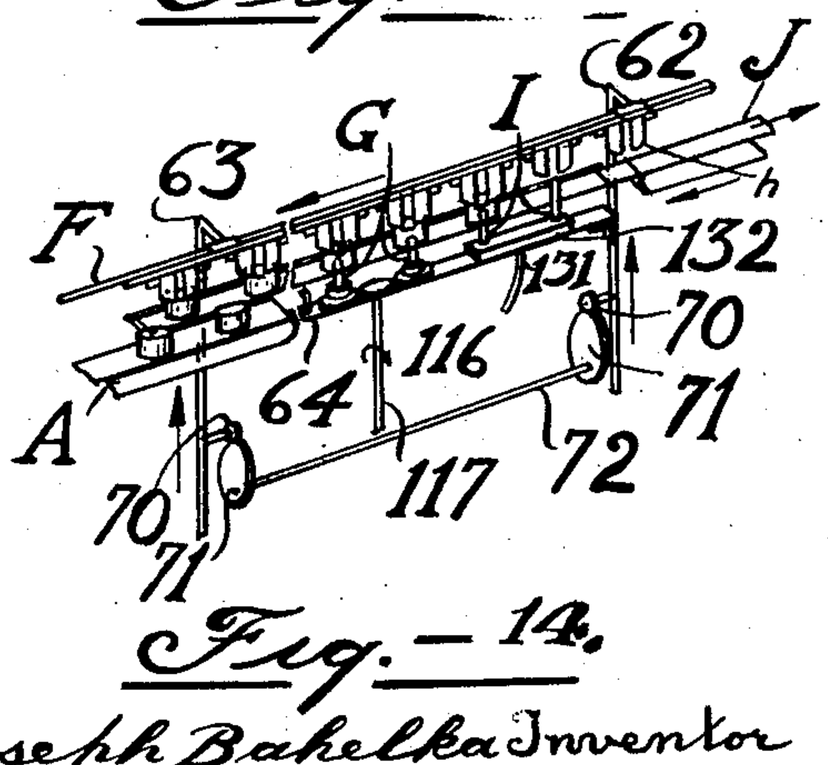

Fig. — 14.

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JAR CLEANING MACHINE

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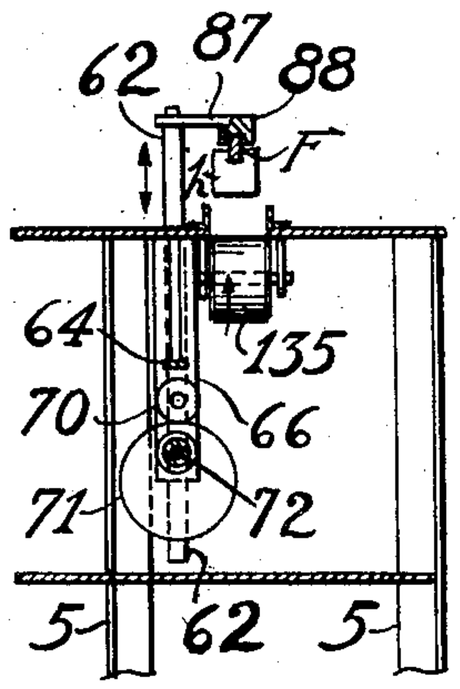

Fig. — 17.

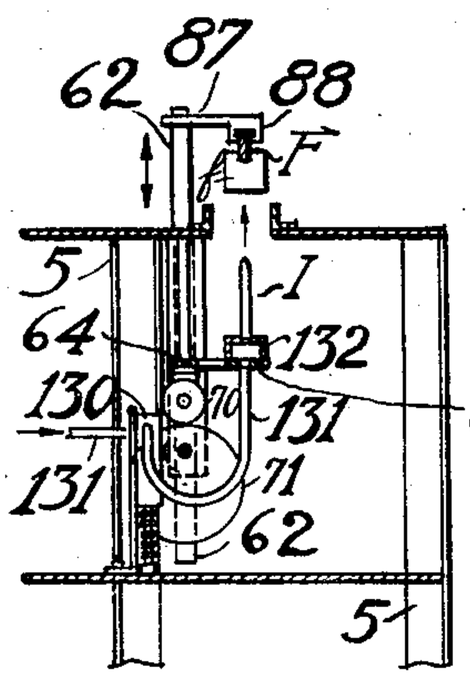

Fig. — 18

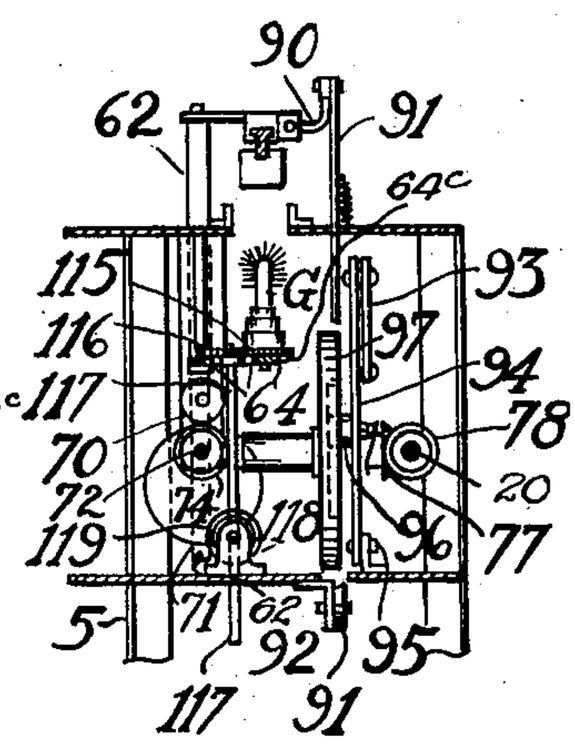

Fig. — 19.

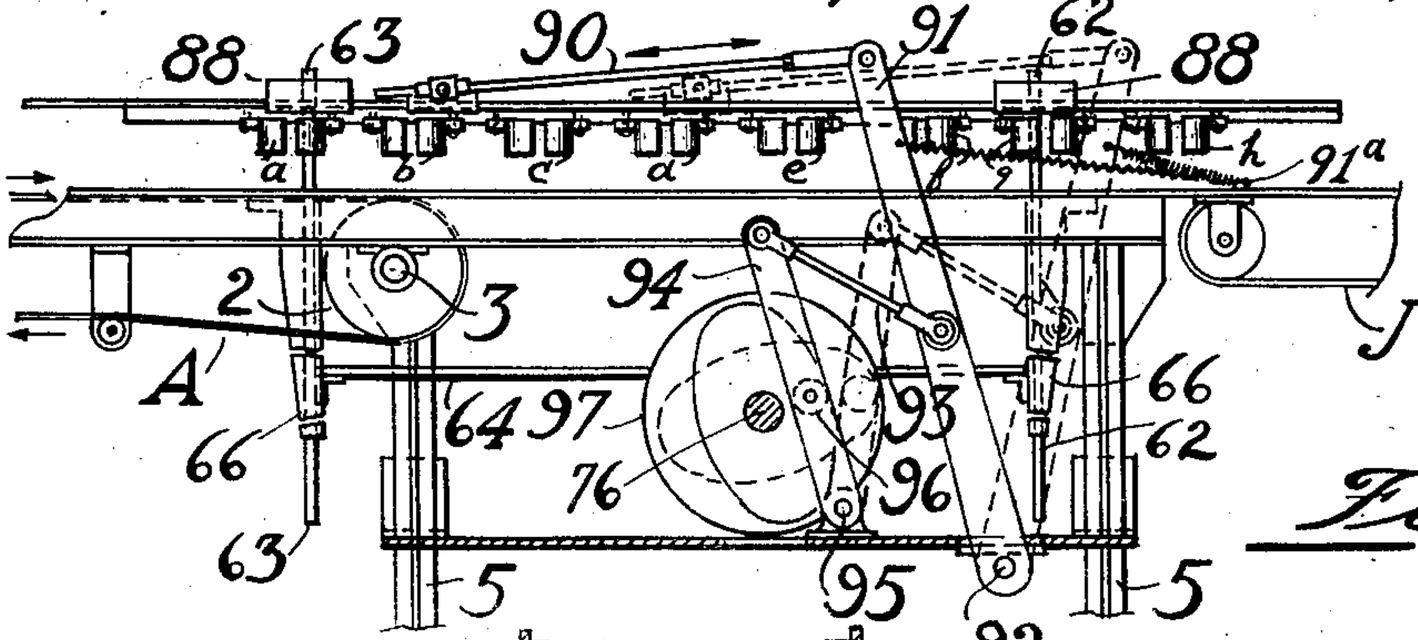

Fig. — 20.

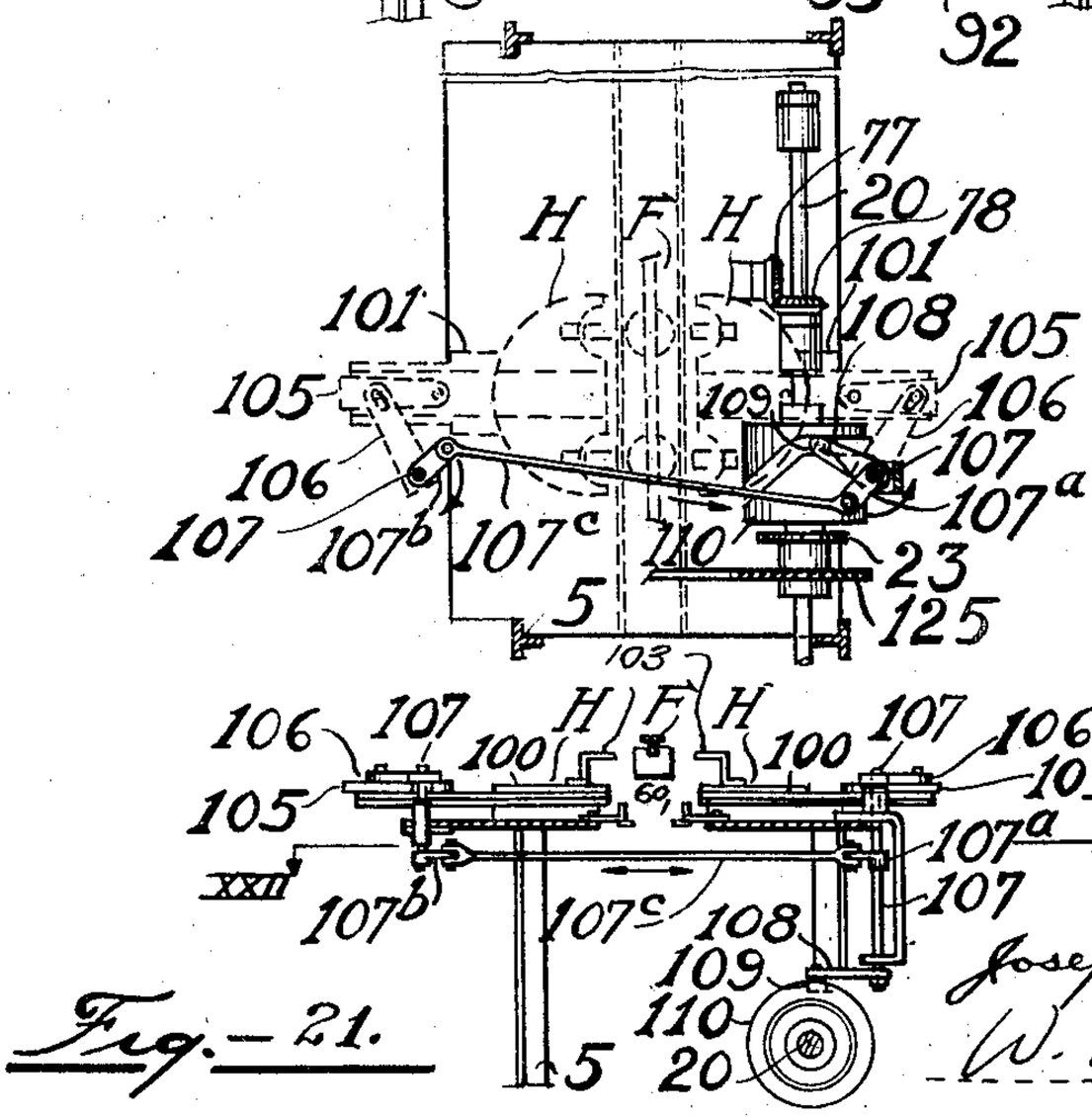

Fig. — 22

Fig. — 21.

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Patented July 12, 1938

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UNITED STATES PATENT OFFICE

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JAR CLEANING MACHINE

Joseph Bahelka, Linden, N. J., assignor to Stanco, Inc.

Application January 21, 1933, Serial No. 652,836

5 Claims. (Cl. 15—56)

This invention relates to improvements in apparatus for cleaning receptacles such as jars or the like.

One object of this invention is to clean the receptacles mechanically in a fixed cycle and in a positive manner.

Another object is to clean receptacles mechanically using a straight line motion.

Still another object is to clean the receptacles with a combined brushing and air blasting operation.

Other objects will be apparent when the specification is taken in connection with the accompanying drawings in which latter—

Fig. 1 is a side elevational view of the device;

Fig. 2 is a top plan view of the device;

Fig. 3 is a longitudinal horizontal sectional view taken along the line III—III of Fig. 1;

Fig. 4 is a sectional plan view taken along the line IV—IV of Fig. 1;

Fig. 5 is a longitudinal sectional view taken along the line V—V of Fig. 2; Fig. 5*a* is a top plan view of a preferred shape of the cups *a* to *h*; Fig. 5*b* is a side elevational view of the structure illustrated in Fig. 5*a*;

Fig. 6 is a horizontal longitudinal sectional view taken along the line VI—VI of Fig. 5;

Fig. 7 is a transverse sectional view taken along the line VII—VII of Fig. 2;

Fig. 8 is a transverse sectional view taken along the line VIII—VIII of Fig. 2;

Fig. 9 is a detail transverse sectional view of the jar guide; and

Figs. 10 to 15 inclusive are diagrammatic views in perspective showing step by step the successive positions of the mechanism during the operation of cleaning the jars.

Fig. 16 is a perspective view of a removable stop S.

Fig. 17 is a vertical sectional view taken along the line XVII—XVII of Fig. 5.

Fig. 18 is a vertical sectional view taken along the line XVIII—XVIII of Fig. 5.

Fig. 19 is a vertical transverse sectional view taken along the line XIX—XIX of Fig. 5, with the cross slide mechanism for clamping the jars omitted.

Fig. 20 is a detail side elevational view of the mechanism for effecting reciprocation of feed bar F.

Fig. 21 is a section taken along the line XXI—XXI of Fig. 1; and

Fig. 22 is a horizontal sectional view taken along the line XXII—XXII of Fig. 21.

Referring particularly to the drawings, the apparatus comprises a feed belt A which is adapted to convey jars B in an inverted position against a stop C. The jars are pushed laterally from the conveyor A by means of a cross slide D to a jar guide E. A feed bar F reciprocable parallel with the jar guide E engages the positioned jars and moves them laterally successively into position directly above brushes G. The feed bar F is reciprocable vertically upwardly at the right hand end of its horizontal stroke to a position free of the jars and is reciprocable vertically downwardly at the left hand end of its vertical stroke into position to engage additional jars to be cleaned. The feed bar F is provided with a plurality of fingers *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h*, see Fig. 2, for engaging and positively positioning the jars. The feed bar "F" can be moved longitudinally a distance equal to twice the distance between adjoining pockets.

When the feed bar F has reached the right hand end of its horizontal stroke, the jars over the brushes G are engaged by suitable cross slides H which securely clamp the jars and maintain them in fixed position while the feed bar is moving vertically upwardly, then horizontally to the left as viewed in Fig. 12 and vertically downwardly. The brushes B move upwardly into the interior of the clamped jars when the feed bar F moves upwardly, see Fig. 12, and move downwardly from the clamped jars when the feed bar F moves downwardly.

Successive horizontal movement of the feed bar F to the right brings the brushed jars into position over nozzles I which inject air into the brushed jars, see Fig. 13. The thus cleaned jars B are delivered on to an endless conveyor J, see Fig. 15, by which they are delivered to a suitable place of disposal not shown. Fig. 13 shows the brushes G and the nozzles I in their lowermost position prior to being moved upwardly into jars and with the feed bar F in its lower position.

Fig. 14 shows the feed bar F in its elevated position and the brushes G and the nozzles I projected into the interior of the jars.

Fig. 15 shows the position of the jars in the next succeeding stroke of the feed bar F in the right hand direction. The feed bar F has made one additional stroke to the right, as viewed in Fig. 13, as compared with the showing of Fig. 12, thereby bringing the first jar into position over the first nozzle I.

The feed conveyor A for feeding jars into the machine comprises a belt A one end of which is supported and driven by a pulley wheel 2, see Figs. 1, 5 and 7, mounted on a shaft 3 which is supported in suitable bearings in a main frame 5 of the machine. Power to drive the belt conveyor is supplied from a main drive shaft 8 which is driven by a central source of power, see Figs. 1, 3, 7 and 8, namely motor 9 through a belt 10, speed reducer 11, chain 12, sprocket wheel 14 and clutch 15.

Power is transmitted from the main drive shaft 8 to a cam-shaft 20 through a sprocket wheel 21, chain 22 to a sprocket wheel 23 keyed to the cam-

shaft 20. The cam-shaft 20 drives the feed belt pulley 2 by means of a bevel gear 25, see Fig. 4, keyed to the cam-shaft 20, bevel gear 26, sprocket wheel 27, chain 28 and sprocket wheel 29 keyed to the shaft 3.

The inverted jars B having been carried by the conveyor A until the endmost jar abuts the stop C, the first and third jars are translated laterally from position No. 1 to position No. 2 by means of cross slide D. The second jar is held by a removable stop S which is removed when larger jars are used. The cross slide D comprises a slide plate having spaced arms 35 and 36 adapted to engage the first and third jars. The slide plate is mounted for reciprocating movement transversely of the conveyor A and is actuated by means of a cam 38 driven by the cam-shaft 20. The cam 38 has a cam-way 39 engaged by a cam follower 40 which in turn drives a lever 41 to rotate a post 42 rotatably carried by the main frame 5. The post 42 actuates a lever 43 which through the link 44 reciprocates the cross slide D from position No. 1 to position No. 2 and vice versa.

The post 42 is keyed to a link 50, see Figs. 1, 4 and 7, which in turn has pivotal connection with a link assembly 51, which by pivoting about a pivot point 52*a* secured to the frame of the machine controls the spacer or separator 51*a* for the jars. The bar 51 is returned to its original position and away from the post 42 by means of link 50 through rotation of the post 42 and the cam 38. The light spring 51*b* functions to soften or lessen the shock of the spacer 51*a* against the jars when the slide and spacer come together.

The two jars B having been moved to position No. 2 are supported upon suitable jar guides 60 which extend longitudinally of the main frame 5 of the machine. The jars B are now carried in step by step movement longitudinally of the machine upon the jar guides 60 by means of the feed bar F and its depending fingers *a* to *h* inclusive. The fingers *a* to *h* inclusive are cup shaped members which are adapted to freely receive and positively position the jars. The feed bar F is supported by a feed bar frame including slide bars 62 and 63, see Fig. 5, which depend downwardly and which carry a bridge 64 beneath the jar guide 60, see Figs. 2, 6 and 7. The bridge 64 is composed of a main bar 64 and a parallel bar 64*c*. The feed bar assembly moves up and down with feed bar F and is balanced by a weight 64' to insure smooth action. The weight 64' is supported by a lever 64*a* on one side of the pivotal connection 64*b* of the lever 64*a* to the frame 5. The lever 64*a* on the other side of pivot 64*b* is connected to the bridge 64. The slide bars 62 and 63 are mounted for vertical reciprocation in guideways 66 supported by the main frame 5 of the machine.

The feed bar assembly is driven in vertical reciprocation through the following arrangement of parts: The slide bars 62 and 63 each carries a cam follower 70 which are adapted to be actuated by cams 71 driven by a feed bar cam-shaft 72. The feed bar cam-shaft 72 carries rigidly a mitre gear 74 which meshes with a similar gear 75 on a shaft 76. The shaft 76 carries rigidly a mitre gear 77 which meshes with a similar gear 78 mounted upon the cam-shaft 20.

Horizontal reciprocation of the feed bar F is effected by the following arrangement of parts: The slide bars 62 and 63 of the feed bar frame carry bracket arms 87 at their upper ends which in turn support guideways 88 in which the feed bar F has horizontal reciprocatory movement parallel with the jar guide 60. This movement is effected through a link 90 which is pivotally attached at one end to the feed bar F and at its other end to a lever 91, see Figs. 1, 2 and 20, the base of which is pivoted at 92 to the frame 5 of the machine. A link 93 is pivotally connected to an intermediate portion of the lever 91 at one end and is pivotally connected at its opposite end to a cam-lever 94. The cam-lever 94 is pivoted to the main frame 5 at 95. The cam-lever 94 carries a cam follower 96 which engages in the camway of a feed bar stroke cam 97 driven by the shaft 76. The lever 91 is normally maintained in its retracted position indicated in dotted lines in Fig. 20 by means of a helical spring 91*a*.

The vertical and longitudinal reciprocation of the feed bar F is so timed that when the feed bar F is at the left hand end of its stroke as viewed in Fig. 1, the feed bar is drawn vertically downwardly into position for the feed bar fingers *a* and *b* to engage jars B which have been positioned upon the jar guide 60. The feed bar F is then moved to the right as viewed in Fig. 11 while retained in its lower position thereby moving the jars forwardly. The feed bar is then lifted vertically upwardly to a position in spaced relation to the jars after which the feed bar is moved horizontally to the left as viewed in Fig. 12 to its initial position. The jars are thus moved forwardly in successive increments to position the jars successively directly above the brushes G.

When the feed bar F has arrived at the end of its stroke to the right as viewed in Figs. 1, 2 and 11 the jars are clamped between the cross slides H. The cross slides comprise plate members 100 mounted for reciprocation transversely of the jar guide 60 in guideways 101. The plate members 100 are recessed at 102 and are provided with fingers 103 to receive the jars. The plate members are reciprocated by the following arrangement of parts: A link 105 has pivotal connection with the plate members and with a lever 106. The lever 106 is actuated by means of a post 107 rotatably mounted in the frame 5 of the machine. The post 107 carries at its bottom a cam lever 108 carrying a cam follower 109 which engages in the camway of a cam 110 driven by the shaft 20. The post 107 has driving connection with the farther cross slide H by means of an arm 107*a* pivotally connected to a link 107*c* which in turn is pivotally connected to an arm 107*b* rigidly secured to the post 107 which actuates this particular cross slide H.

The brushes G are elevated upon the upward stroke of the feed bar F into the interiors of the clamped jars and are retained in their elevated position while the feed bar F passes in horizontal travel to the left as viewed in Fig. 1. The brushes G are driven in rotation through the following arrangement of parts: The brushes G which are situated on bridge 64 carry gears 115 which mesh with a gear 116. The gear 116 is mounted upon a shaft 117 which carries a bevel gear 118. The bevel gear 118 meshes with a bevel gear 119 on a shaft 120. The shaft 120 carries a sprocket wheel 121 which is driven through a chain 122 and sprocket wheel 125 from the cam-shaft 20.

The revolving brushes loosen and remove any particles of dirt upon the interior of the clamped jars while the feed bar F is making its return

stroke. The cross slides H then separate releasing the jars whereupon both the feed bar F and the brushes G are lowered.

The jars are now moved horizontally to the right as viewed in Fig. 1 to a position directly over the nozzles I, situated on bridge **64**. Upward movement of the frame carrying the nozzles I injects the nozzles into the interior of the jars whereby the inner surfaces of the jars are cleaned by a blast of fluid such as air or the like. Any loosened material remaining after the brushing operation is blown from the jars. The supply of air to the nozzles I is controlled by an air valve **130** contained in an air line **131** which opens into an air chamber **132** mounted upon the bridge **64**, see Figs. 4 and 5. The nozzles I project directly from the air chamber **132**. The clean jars are delivered from the jar guide **60** to a conveyor J which conducts the clean jars to a suitable place of disposal, not shown.

My invention is not to be limited to any specific disclosure described herein but only by the following claims in which I wish to claim all novelty not inherent in the prior art.

I claim:

1. A jar cleaning machine, comprising a guideway adapted to receive jars, a feed bar assembly including a feed bar mounted substantially parallel with and spaced from the guideway and having a plurality of spaced jar receiving pockets disposed throughout its length, means for effecting horizontal reciprocation of the feed bar whereby the jars are moved forwardly along the guideway on the forward stroke of said feed bar, cleaning elements secured to the assembly in spaced relation to and facing the pockets to form a unit with the assembly, and means for moving the unit in one direction at the end of the forward stroke of the feed bar whereby the cleaning elements are inserted into the jars and the pockets are withdrawn from the jars to permit the feed bar to pass the jars on its rearward stroke and for moving the unit in the opposite direction at the end of the rearward stroke of the feed bar whereby the cleaning elements are withdrawn from the jars and the thus treated jars are received by the pockets.

2. A jar cleaning machine, comprising a guideway adapted to receive jars, a feed bar assembly including a feed bar mounted substantially parallel with and spaced from the guideway and having a plurality of jar receiving pockets disposed throughout its length, means for effecting horizontal reciprocation of the feed bar whereby the jars are moved forwardly along the guideway on the forward stroke of said feed bar, means for holding jars on said guideway in fixed stationary position at the end of each forward stroke, cleaning elements secured to the assembly in spaced relation to and facing the pockets to form a unit with the assembly and means for moving the unit in one direction at the end of the forward stroke of the feed bar whereby the cleaning elements are inserted into the held jars and the pockets are withdrawn from the held jars to permit the feed bar to pass the jars on its rearward stroke, and for moving the unit in the opposite direction at the end of the rearward stroke of the feed bar whereby the cleaning elements are withdrawn from the held jars and the thus treated jars are again received by the pockets.

3. A jar cleaning machine, comprising a guideway adapted to receive jars, a feed bar assembly including a feed bar mounted substantially parallel with and spaced from the guideway and having a plurality of depending spaced jar receiving pockets disposed throughout its length, means for effecting horizontal reciprocation of the feed bar whereby the jars are moved forwardly along the guideway on the forward stroke of said feed bar, means for holding jars on said guideway in fixed stationary position at the end of each forward stroke, cleaning elements secured to the assembly below and in spaced relation to and facing the pockets to form a unit with the assembly, and means for moving the unit vertically upwardly at the end of the forward stroke of the feed bar whereby the cleaning elements are inserted into the held jars and the pockets are withdrawn from the held jars to permit the feed bar to pass the jars on its rearward stroke and for moving the unit vertically downwardly at the end of the rearward stroke of the feed bar whereby the cleaning elements are withdrawn from the jars and the thus treated jars are received by the pockets.

4. A jar cleaning machine, comprising a guideway, means including spaced arms for positioning jars in spaced relation on the guideway in inverted position, a feed bar assembly including a feed bar mounted substantially parallel with and spaced from the guideway and having a plurality of pockets disposed throughout its length spaced to receive the positioned jars, means for effecting horizontal reciprocation of the feed bar whereby the jars are moved forwardly along the guideway on the forward stroke of said feed bar, cleaning elements secured to the assembly in spaced relation to and facing the pockets to form a unit with the assembly and means for moving the unit in one direction at the end of the forward stroke of the feed bar whereby the cleaning elements are inserted into the jars and the pockets are withdrawn from the jars to permit the feed bar to pass the jars on its rearward stroke and for moving the unit in the opposite direction at the end of the rearward stroke of the feed bar whereby the cleaning elements are withdrawn from the jars and the thus treated jars together with freshly fed jars are received by the pockets.

5. A jar cleaning machine, comprising a guideway, means for feeding jars into spaced inverted position upon the guideway, a feed bar assembly including a feed bar mounted substantially parallel with and spaced from the guideway and having a plurality of depending pockets disposed throughout its length spaced to receive the positioned jars, means for effecting horizontal reciprocation of the feed bar whereby the jars are moved forwardly along the guideway on the forward stroke of said feed bar, means for holding jars on said guideway in fixed stationary position at the end of each forward stroke, cleaning elements secured to the assembly below and in spaced relation to and facing the pockets to form a unit with the assembly, and means for moving the unit vertically upwardly at the end of the forward stroke of the feed bar whereby the cleaning elements are inserted into the held jars and the pockets are withdrawn from the held jars to permit the feed bar to pass the jars on its rearward stroke and for moving the unit vertically downwardly at the end of the rearward stroke of the feed bar whereby the cleaning elements are withdrawn from the held jars and the thus treated jars together with the freshly fed jars are received by the pockets.

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