Jan. 2, 1934. W. MAKENNY 1,941,992

BASE FEED AND STAKING MACHINE

Filed July 12, 1930 6 Sheets-Sheet 1

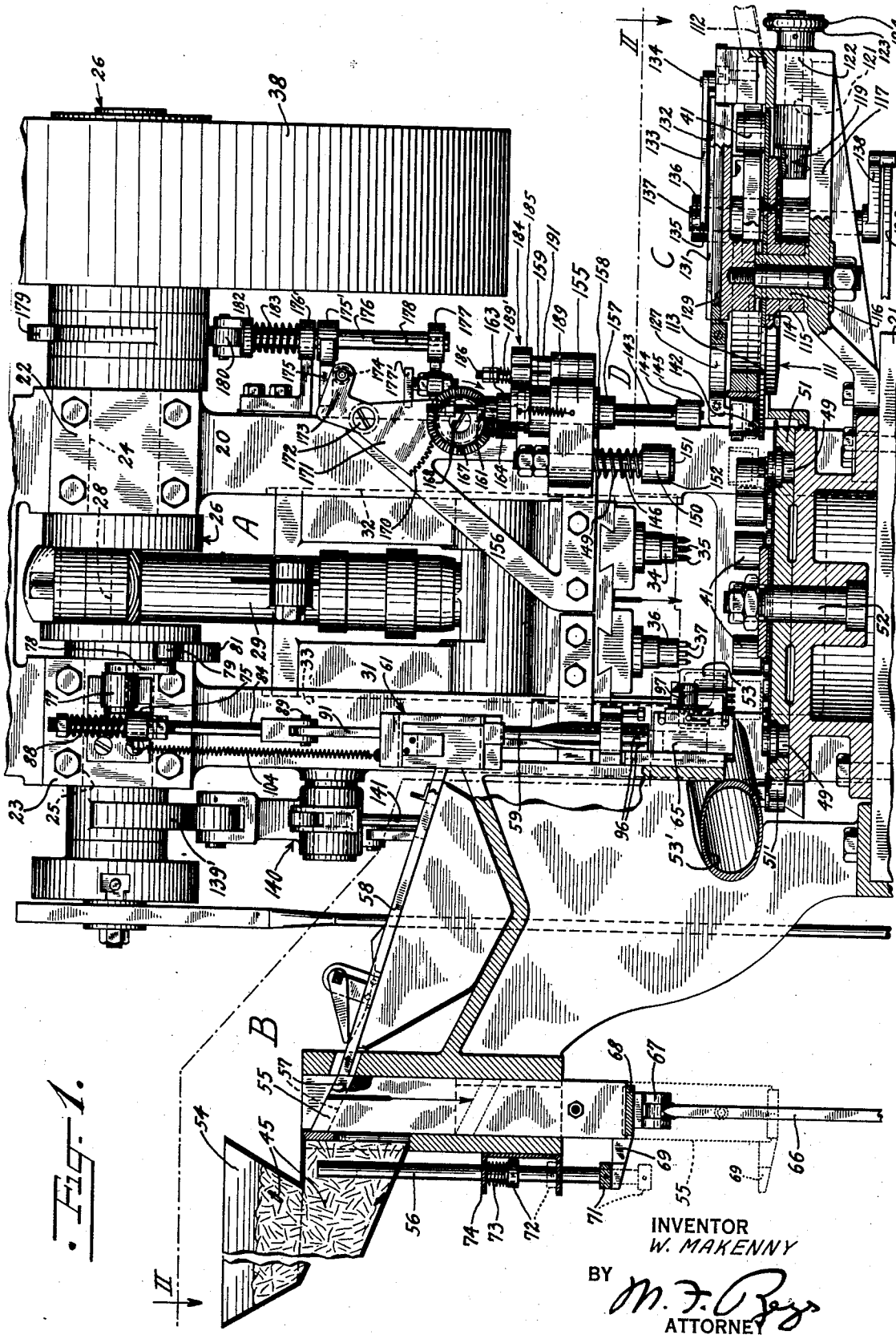


Fig. 1.

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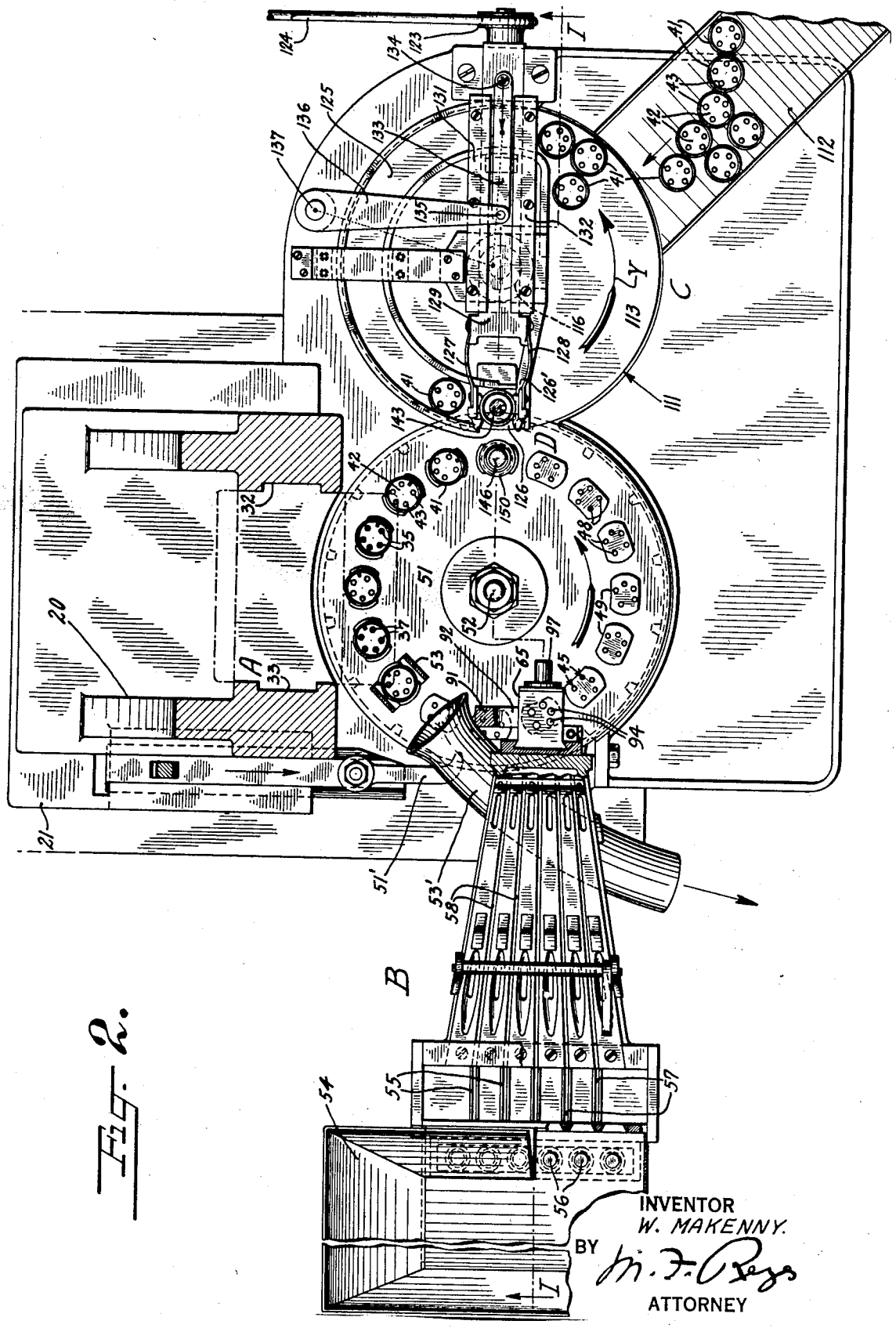


Fig. 2.

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Fig. 3.

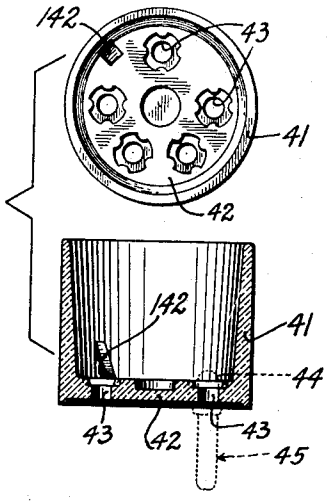


Fig. 4.

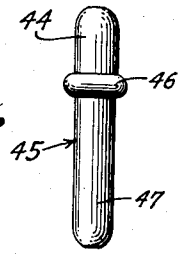


Fig. 7.

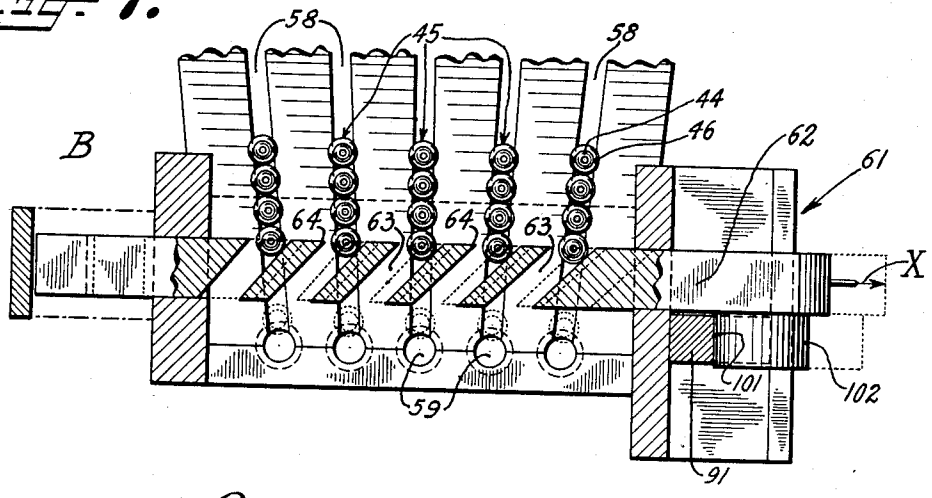


Fig. 9.

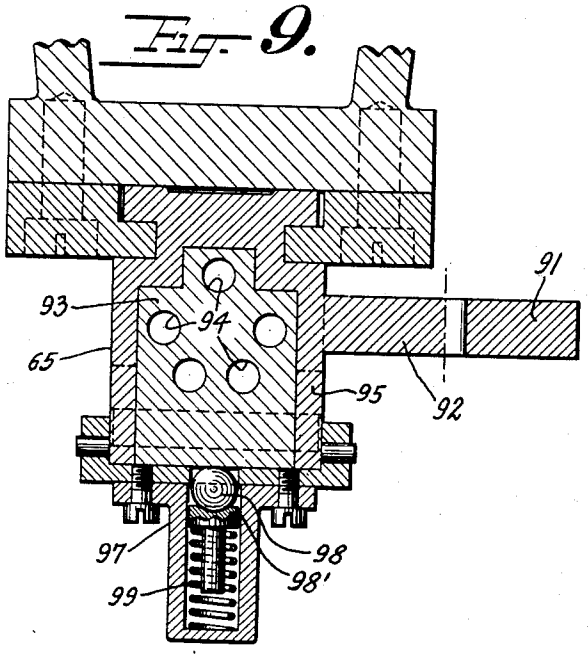
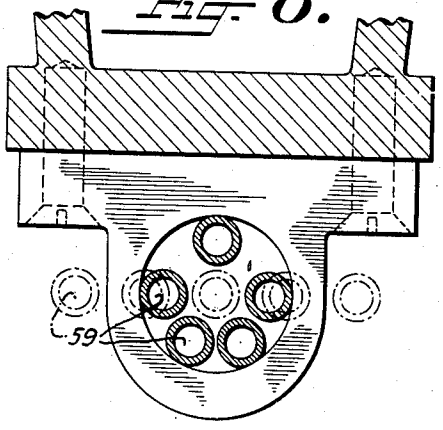


Fig. 8.



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Fig. 6.

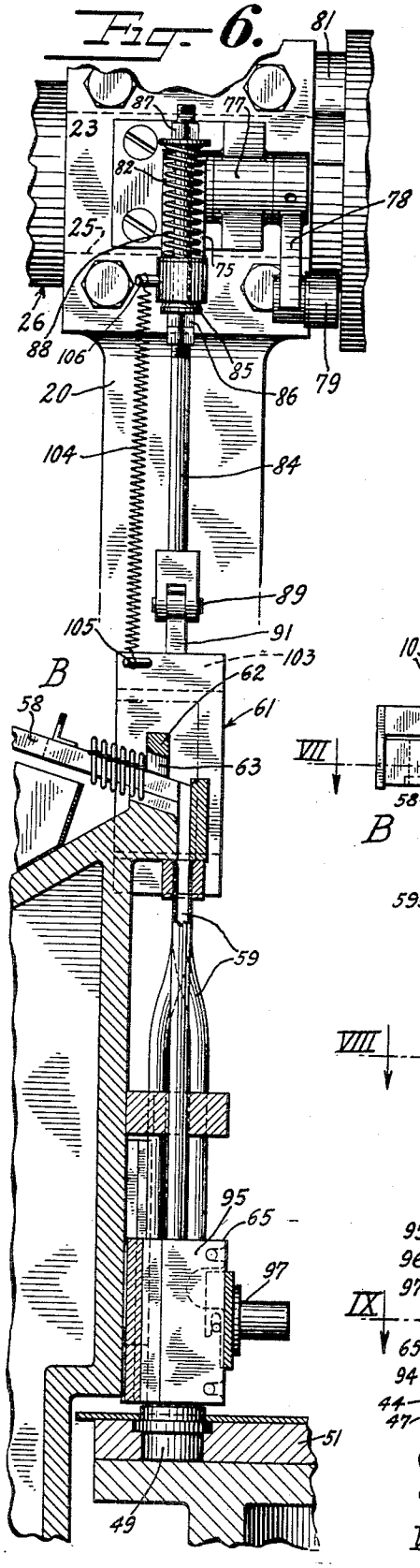
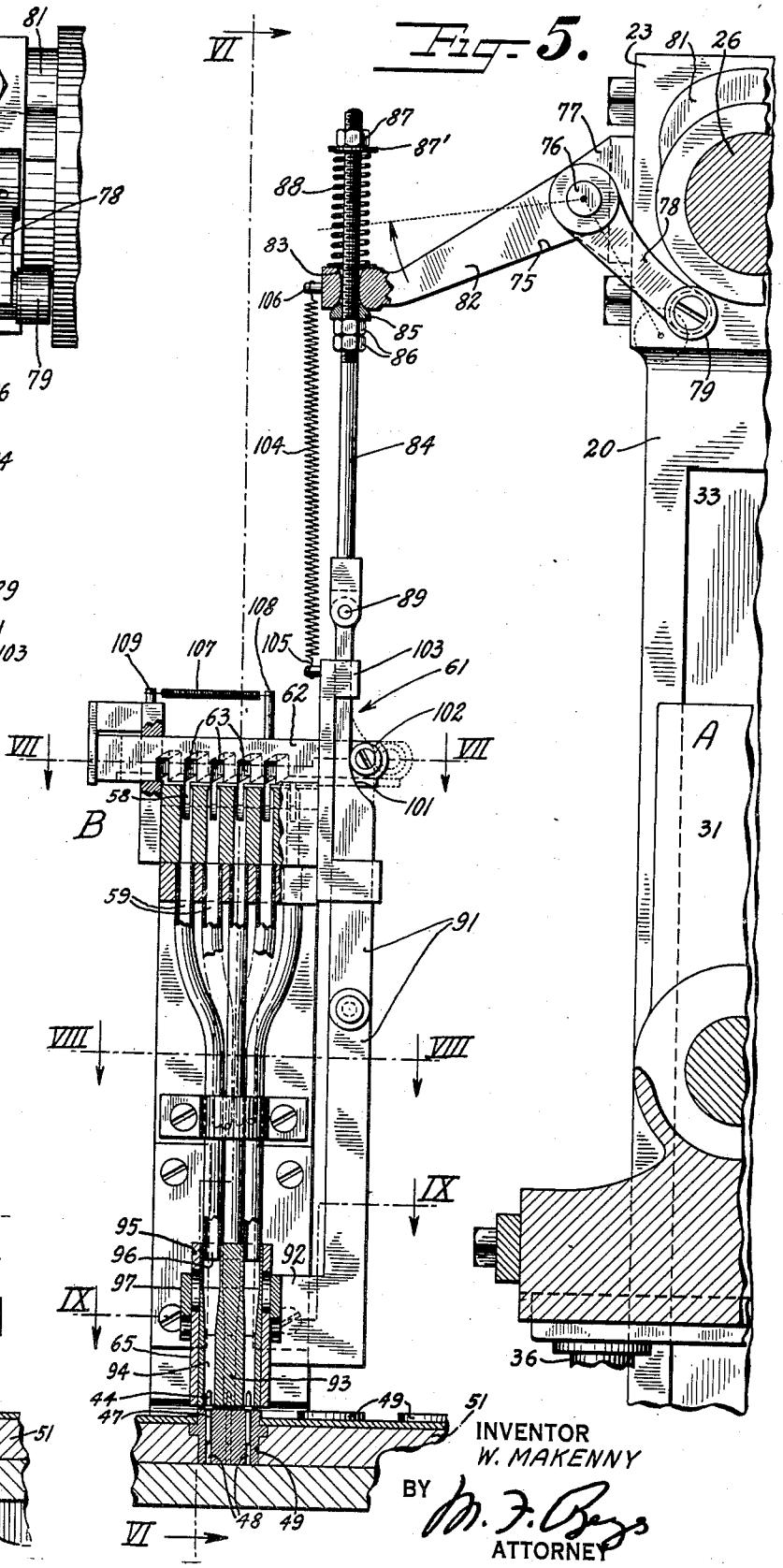


Fig. 5.

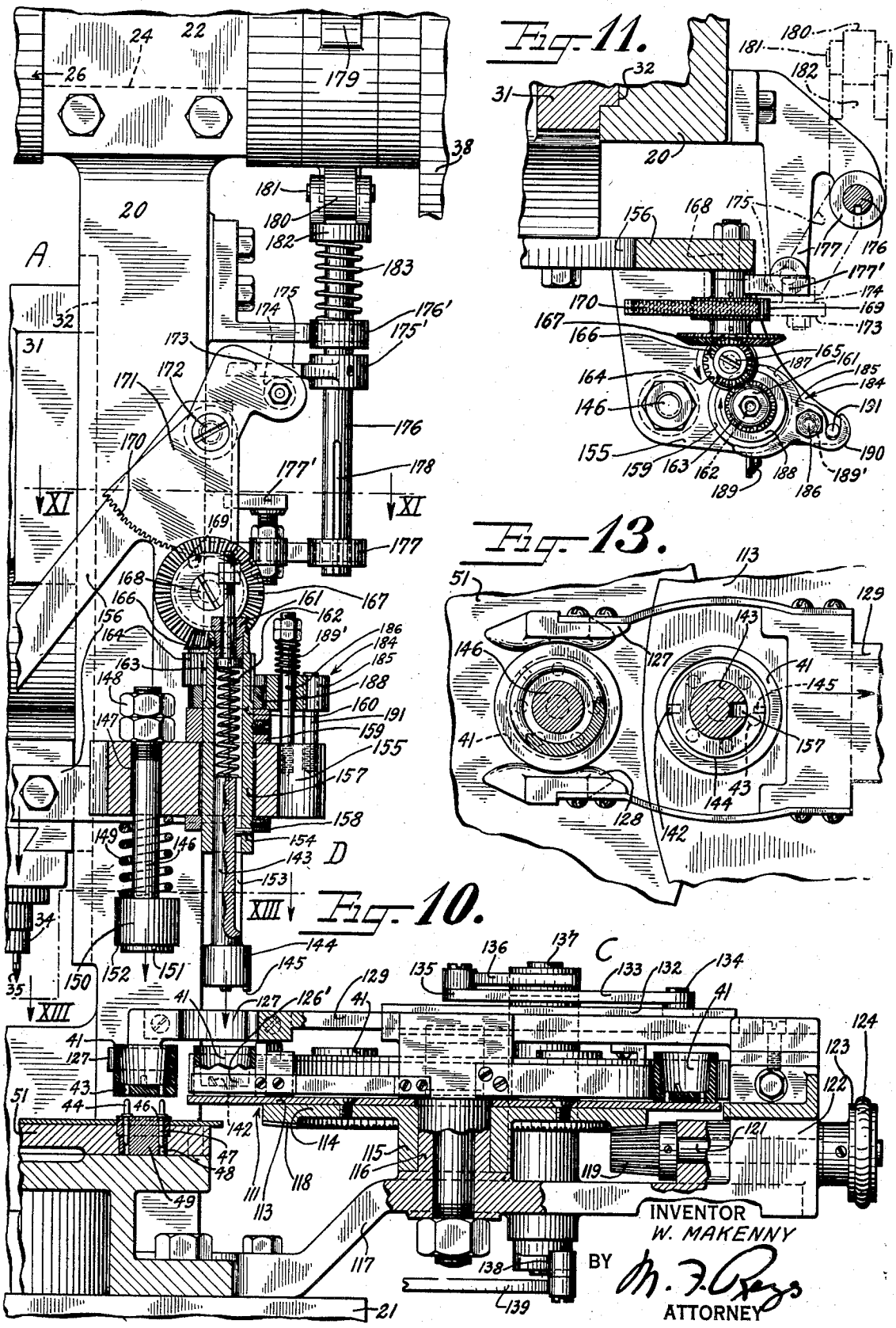


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Fig. 12.

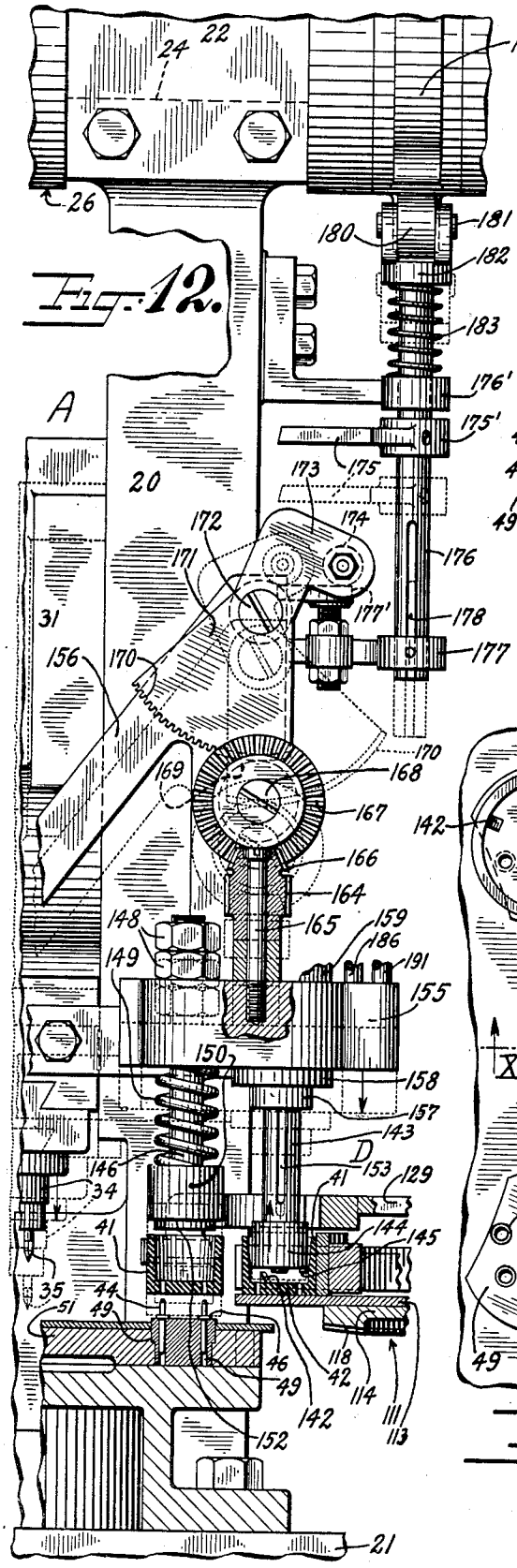
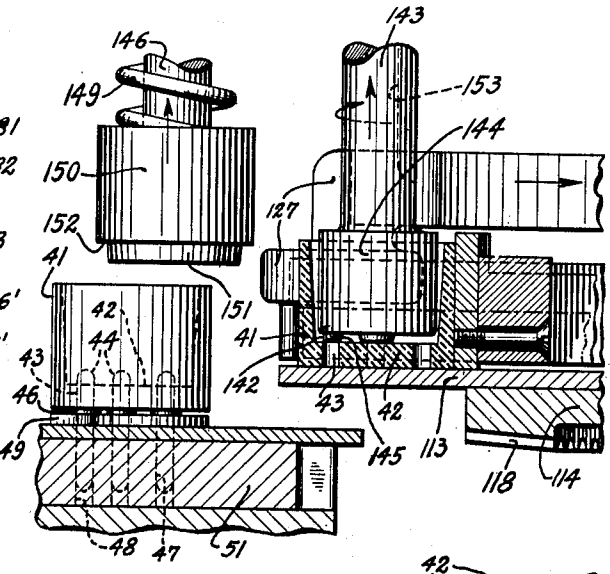


Fig. 15.



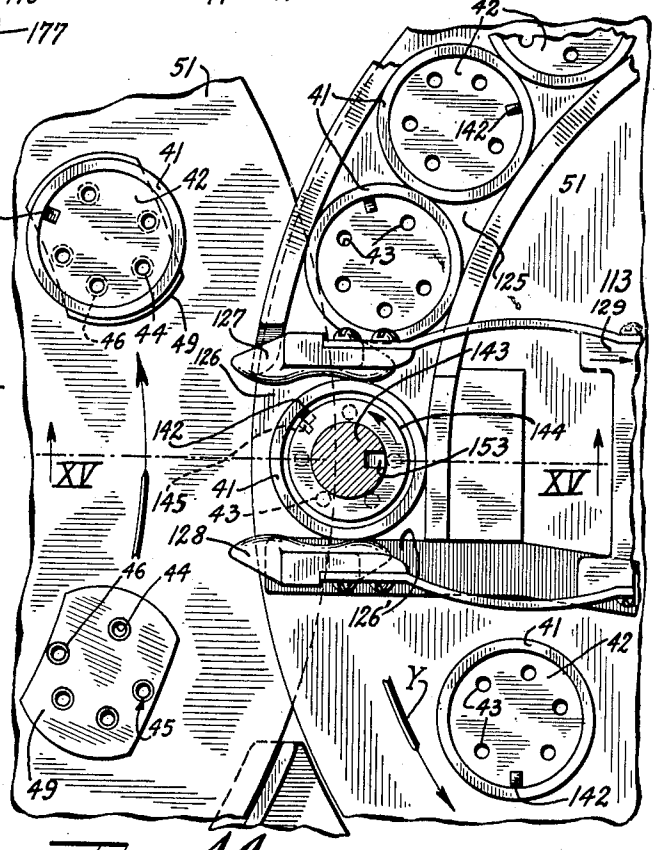


Fig. 14.

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Patented Jan. 2, 1934

1,941,992

UNITED STATES PATENT OFFICE

1,941,992

BASE FEED AND STAKING MACHINE

William Makenny, Mountain View, N. J., assignor to Westinghouse Lamp Company, a corporation of Pennsylvania

Application July 12, 1930. Serial No. 467,532

16 Claims. (Cl. 218—0.5)

This invention relates to the manufacture of electrical devices and relates more particularly to operations performed on the base portions of radio tubes or the like.

In the manufacture of electrical devices which employ a number of electrodes enclosed in a sealed glass envelope, the container is usually provided with what is termed a base. The base is in the form of a cap or cup and is secured by cement or otherwise to the neck portion of the bulb, and usually the base is made of molded insulative material of any suitable composition that may be compressed by means of a die to produce the base formation.

When using a composition base it is necessary to provide the same with a plurality of projecting contact elements or contact pins. In certain types of bases four contact pins are employed while in bases for other types of devices five contact pins are employed, and the present invention is shown and described in connection with bases having five contact pins and means are disclosed whereby a base and pins may be assembled and the pins secured in the bottom wall of the base. The pins are fastened to the bottom wall in such positions as to project perpendicularly therefrom and are usually of tubular form to receive lead wires or conductors which extend from the electrodes within the device and which conductors are soldered or otherwise secured to the contact elements.

In Patent No. 1,783,706 issued December 2, 1930 for Base pin staking machine assigned to the same assignee as is the present invention, a machine is disclosed for positioning and handling bases for the application of four contact pins.

In this type of machine the bases are provided with suitably arranged apertures in their bottom walls which apertures are disposed in four square formation and the bases are adjusted so that positioned pins enter the apertures in the bases.

The operation of adjusting the bases in the aforesaid patent consisted in utilizing an externally projecting bayonet pin which functioned in combination with other mechanism to arrange the base in a definite position.

The developments in radio tube manufacture have, however, resulted in a change in the type of socket to which the base is applied and the external bayonet pin is eliminated. Furthermore, in radio tubes of the A. C. type five contact pins are employed. It is therefore necessary to provide mechanism which will automatically feed five contact pins to definite positions and to provide means for adjusting a base for application to the positioned pins.

The present invention provides pin feeding mechanism in combination with pin staking means which latter means cooperates to actuate a mechanism for rotating and adjusting a base received from a base feeding mechanism. For the purpose of providing a definite means for rotating and adjusting a base the interior of the base is provided with a lug and in accordance with the present machine an adjuster member enters the base and engages the lug to rotate the base about its longitudinal axis so that the said base takes a definite position and is ready to be transferred to a conveyor having pins assembled thereon in definite relation for entrance into the apertures of the base.

The base is then moved to position for a staking operation. The various mechanisms for feeding and positioning bases, for feeding and positioning pins and for moving the bases with the pins therein in position for a staking operation are arranged in co-relation to provide a continuous automatic base pin staking machine which will effectively feed five contact pins simultaneously and adjust a base to position the apertures thereof to receive the pins.

It is an object of the present invention therefore to provide a base pin staking machine capable of feeding pins and bases for a staking operation.

Another object of the invention is to provide mechanism for automatically adjusting a base for position over a plurality of pins in combination with means for moving the base to insert the pins in apertures thereof.

Another object of the invention is to provide a machine for automatically adjusting a base by means integral with the inner surface of the base.

Other objects and advantages will be evident from the following description together with the accompanying drawings, in which

Fig. 1 is a front elevational view partly in section showing pin feeding, pin staking and base feeding mechanism;

Fig. 2 is a plan view of the machine showing the various mechanisms illustrated in Fig. 1;

Fig. 3 shows a bottom and vertical sectional view of a base with a contact pin indicated in dotted lines;

Fig. 4 is an enlarged side elevational view of a contact pin of the type employed in connection with the present mechanism;

Fig. 5 is a fragmentary view of pin feeding mechanism partly in section;

Fig. 6 is a view taken on lines VI—VI in Fig. 5;

Fig. 7 is a view taken on lines VII—VII in Fig. 5;

Fig. 8 is a view taken on lines VIII—VIII in Fig. 5;

Fig. 9 is a view taken on lines IX—IX in Fig. 5;

Fig. 10 is a fragmentary view showing a portion of pin staking mechanism and base feeding mechanism illustrating the intermediate means for adjusting the base fed to the pin staking mechanism; portions of the said view being shown in cross section.

Fig. 11 is a view taken on lines XI—XI in Fig. 10;

Fig. 12 is a fragmentary view partly in section showing mechanism for adjusting the base, partly in section and with certain portions removed to more clearly show operating mechanism;

Fig. 13 is a view taken on lines XIII—XIII in Fig. 10;

Fig. 14 is a fragmentary plan view showing the relation of the base feeding mechanism to the conveyor which supports groups of pins and

Fig. 15 is a view taken on lines XV—XV in Fig. 14.

The present machine may comprise the following cooperating mechanisms.

Pin staking or riveting mechanism A operable to receive and simultaneously stake five pins in a base.

Pin feeding mechanism B adapted to simultaneously position five pins in position on the pin staking mechanism.

Base feeding mechanism C for delivering bases to position over the pins in the pin staking mechanism.

Base adjusting mechanism D disposed intermediate the base feeding and pin staking mechanisms to adjust a base so that the apertures for receiving the positioned pins will be aligned with and receive the pins to be secured to the bases by the pin staking mechanism.

Pin staking mechanism

The pin staking mechanism may be of the same general construction as shown in the patent above referred to. This mechanism (see Fig. 1) may comprise a supporting standard or frame 20 mounted on a table or bed plate 21 and having elevated horizontal bearings 22 and 23. The bearings 22 and 23 may be spaced apart and have journaled therein portions 24 and 25 of a crank shaft 26 the eccentric portion 28 being pivotally attached by means of a connecting rod 29 to a head 31 slidable vertically in guides 32 and 33 in the frame 20.

At the lower end of the head 31 is mounted a holder 34 having five pin splitting tools 35 and a holder 36 having five staking or riveting punches 37. The crank shaft 26 may be driven by means of a pulley 38 from a source of power (not shown). A rotation of the shaft will cause a reciprocation of the head 31 to simultaneously split one set of pins in a base and rivet or stake a set of pins in another base.

As shown in Figs. 3 and 4 the bases to be adjusted and have pins secured thereto may consist of a composition shell 41 having a bottom wall 42 and a plurality of holes 43 to receive shanks 44 of tubular pins 45.

The pins 45 may each be provided with a shoulder 46 and when in position to be staked are held by inserting portions 47 in apertures 48 in hardened inserts 49 suitably positioned on a conveyor 51 rotatable intermittently on shaft 52 by means of a pawl 51' reciprocated by mechanism not described (see Fig. 2).

The splitting and staking tools are operated in timed relation to the movement of the conveyor so that with each intermittent movement thereof a base with staked in pins is ready to be removed which may be accomplished by hand or automatically, as for example, by a lifter 53 and a compressed jet nozzle (not shown) which will discharge the bases into chute 53'.

Pin feeding mechanism

Means for feeding pins to the conveyor 51 may comprise a hopper 54 (see Figs. 1, 2, 5, 6 and 7) which pins 45 may be deposited promiscuously and which is provided with five vertically movable plungers 55. This mechanism may be constructed along the lines of the pin feeding mechanism shown in the above mentioned patent and include five plungers or pin carriers 55 which reciprocate adjacent to and receive pins from the hopper 54. Pin agitator members 56 are movable through the pins to stir them up and cause them to become deposited upon the upper ends of the pin carriers. The upper edge of each pin carrier is provided with a slot 57 in which pins become disposed, the width of the slot being slightly greater than the diameter of the bodies of the pins which rest on the edges of the carrier by reason of the shoulders 46 on the pins.

The slots on the carriers are inclined and as the carriers are moved upwardly, these slots become aligned with inclined guides 58 leading to chutes 59. As the pins move downwardly toward the chutes, however, their passage is interrupted by a separator member 61 comprised of a slide-rod 62 (see Fig. 7) having angular slots 63 so disposed that upon a lateral movement of the slide rod the edges 64 of the rod will separate forward pins from those following and a continued movement of the rod in the direction of the arrow "X" will force the separated pins down the guides and into chutes 59 while the slide rod 62 when in its advanced position will prevent the following pins from passing to the chute. A return movement of the rod will place it in position to repeat the above operation so that with each reciprocation of the rod five pins are fed to the chutes for travel downwardly and deposit in the apertures 48 on the conveyor which is operated to position a set of apertures in alignment with the outlets of the chutes 59.

For the purpose of guiding the pins to the apertures it is desirable to provide the chutes with a movable terminal-guide 65 which may be moved downwardly over the several apertures in the conveyor and adapted to be lifted clear of the projecting shanks 44 of the pins after the pins have been deposited to permit the conveyor to move to its next position. The pin carriers 55 may be reciprocated by means of a link 66 pivoted at 67 to a cross head 68 upon which the carriers are mounted. The agitator member 56 may comprise rods having their lower ends disposed for engagement with lifter arms 69 extending from the cross head 68.

The lifter arms engage ends 71 of the members 56 which are provided with collars 72 for engagement with springs 73 which butt against stop members 74 so that after they are lifted the members 56 will be rapidly returned to their

lower positions. The link 66 may be connected to any suitable movable portion of the machine, means for making such connection being readily understood, the same is not shown herein.

Means for actuating the slide plate 62 as well as the terminal guide 65 may comprise an offset bell crank member 75 pivoted at 76 on a bearing bracket 77 secured to the frame 20 of the machine. An arm 78 of the bell crank member may be provided with a roller 79 for engagement with a cam 81 secured to the crank shaft 26. An opposite end 82 of the bell crank member may be provided with an aperture 83 to receive a pull rod 84. A stop member 85 and lock nuts 86 provide a seat for the arm 82 so that it may impart a downward thrust to the pull rod 84. The upper end of the rod is provided with a nut 87, a collar 87' and a helical spring 88. The spring 88 may be disposed between the said collar and the end of the arm 82 to provide a cushion action when the arm 82 is actuated to lift the pull rod 84. The pull rod is pivoted at 89 with a lifter plate 91 having its lower end 92 secured to the terminal guide 65. This terminal guide as shown in Fig. 9 comprises a block 93 having apertures 94 aligned with ends 96 of the chutes 59.

The block 93 is, however, slidable in a casing 95 and a tension device 97 comprising a ball 98 pressed against the block by means of a concave seat 98' under tension of a spring 99 holds the block from moving freely but permits its adjustment when the terminal guide is moved down to align the passages 94 with the pin apertures in the conveyor. The lifter plate 91 which moves the pin terminal 65 is provided with a cam surface 101 which engages a roller 102 on the slide plate 62 so that upon a reciprocation of the lifter plate 91 the slide plate 62 will be reciprocated laterally.

A suitable bracket bearing 103 fastened to a stationary portion of the machine is provided for the lifter plate 91. A spring 104 having an end 105 secured to the bracket 103 and its opposite end secured to a pin 106 at the end of the arm 82 normally holds the said arm in a lower position.

By reason of the stop 85 the arm 82 under the action of the spring 104 normally holds the terminal guide 65 in its lower position. An upward movement of the arm 82 upon a movement of the cam 81 causes the lifter plate 91 to be lifted under the cushioning effect of the spring 88. The slide plate 62 which is also actuated by the lifter plate 91, is provided with a spring 107 having one end connected to a pin 108 extending from the slide plate 62 and the opposite end connected to a pin 109 secured to a stationary portion of the machine so that after the lifter plate is moved downwardly the spring 107 will cause a movement of the slide plate in a direction opposite to that effected by the cam surface 101 on the lifter plate 91.

Base feeding mechanism

Bases may be fed to the conveyor 51 by means of a rotary disc feeder 111 (see Fig. 2). The rotary disc feeder is mounted on the bed plate or table 21 and bases may be fed thereto by means of an inclined guide 112. It is necessary that the bases be fed to the rotary feeder in given positions, that is, with their closed ends down so that they may be fed into the pin staking machine and the positioned pins inserted in the apertures in the bottom wall of the base from the exterior to the interior.

The bases may be fed to the guide 112 by hand or they may be automatically adjusted in a machine such as that shown in my copending application Serial No. 425,452 filed February 3, 1930 in which the bases are automatically positioned and may be delivered to the rotary feeder 111. The rotary feeder 111 may comprise a disc 113 (see Figs. 2 and 10) mounted on a circular plate 114 having a hub 115 rotatable about a hollow spindle 116 integral with a bracket 117. The plate 114 is provided with bevel teeth 118 disposed in mesh with a bevel gear 119. The gear 119 may be mounted on a horizontal shaft 121 extending through a bearing 122 and having a pulley 123 over which a belt 124 is led. The belt may be connected to any suitable source of power (not shown) for operating the bevel gear 119 and thus rotating the feeder disc 113 which rotates at relatively high speed.

The feeder disc is provided with a semi-circular guide 125 and as the disc is rotated in the direction of the arrow Y (see Fig. 2) bases move along the guide which is so proportioned that only a single file of bases can pass. The centrifugal force of the rotating disc effects a movement of the bases toward an inlet end of the guide.

When a base reaches the outlet end 126 of the guide it is adjusted to a given position by means to be presently described and engaged by a pair of resilient gripper jaws 127 and 128 mounted on a slide-member 129 movable in guides 131 and 132. The slide-member 129 is provided with a link 133 one end of which is pivotally attached at 134 to the slide-plate and the opposite end 135 of the link is pivoted to one end of an arm 136 mounted at the upper end of a vertical shaft 137, the lower end of the shaft 137 (see Fig. 10) is provided with a crank 138 and a crank arm 139 which latter may be connected with a cam 139' on shaft 26 by means of a bell crank 140 and link 141 (partly shown in Fig. 1) for imparting a rotary motion to the shaft 137 to cause the link 133 to produce a reciprocating motion of the slide member 129 so that the jaws 127 and 128 thereof will engage a base as it passes to the outer end of the guide for adjustment and carry the base to position for transfer to the conveyor 51.

It is necessary to adjust the base about its longitudinal axis to position the pin receiving apertures thereof for alignment with the pins on the conveyor. For this purpose the intermediate base adjusting mechanism D is provided and the bases as shown (see Fig. 3) are provided with means in the form of a lug 142 in a predetermined position within the base for engagement with mechanism whereby the base may be rotated through engagement with said lug and the apertures of the base moved to definite positions about the longitudinal axial line of the base. Thus the apertures may be aligned to receive the pins which all have the same definite position on the conveyor when they reach the position at which the base is to be applied to the pins.

The base adjusting mechanism may comprise an adjuster plunger 143 having a centering head 144 provided with a projection 145 on its under side and adjacent to its periphery. The head 144 is of such diameter as to slidably fit the interior cylindrical wall of a base so that when the head is in position within the base, a rotation of the head will cause the projection 145 to engage the lug 142 and rotate the base. The adjuster plunger 143 is so positioned as to be aligned with the longitudinal axis of a base when a base is

at the end 126 of the guide 125 and engaged by a stop 126'. The movement of the rotary disc holds the base against the stop and in position to receive the centering head 144 which enters the base and rotates it to a given position.

It will be evident that the adjuster plunger 143 may be given more than a single revolution so as to insure the projection 145 making contact with the lug 142 of the base and insuring the rotating of the base a complete revolution, thus definitely positioning the apertures of the base for the reception of contact pins. After the base has been adjusted the gripper jaws 127 and 128 move the base to position over the conveyor and with the apertures of the base in alignment with the positioned contact pins at which time a presser member 146 engages the upper edge of the base and forces the same downwardly from between the jaws 127 and 128 until the projecting contact pins have entered their respective apertures and the base is seated on the conveyor ready to be moved beneath the pin splitting tools 35 and the staking tools 37.

The presser member 146 is loosely mounted in an aperture 147 in the carrier plate 155 and may be held by lock nuts 148. A spring 149 disposed between an enlargement or head 150 serves to normally retain the said member in a lower position. The head 150 is provided with a boss 151 to enter the base and a shoulder 152 is provided to engage the edge of the base to force it downwardly and cause positioned pins to enter the provided apertures in the bottom wall of the base at which time the base is removed from between jaws 127 and 128, which then return to grip another base.

The base adjusting mechanism D (see Figs. 1, 10, 11 and 12) is carried on a bracket 156 secured to the head 31 in which the staking tools are mounted so that with each complete reciprocation of the head the rotatable adjuster plunger 143 is moved into and out of a base on the disc 113. The plunger 143 is movable vertically in a bushing 157 and is provided with a longitudinal slot or key way 153 to receive a key 154. The bushing 157 is secured against vertical movement by collars 158 and 159 mounted on opposite sides of a carrier-plate 155. An upper end 160 of the bushing 157 is provided with a stop plug 161 and a helical spring 162 is disposed between an end of the adjuster member 143 and the plug to act as a cushion when the adjuster plunger engages a base.

For the purpose of rotating the plunger 143 the bushng 157 is provided with a pinion 163 in mesh with a pinion 164 rotatable on a shaft 165 and having integral therewith a bevel gear 166 in mesh with a bevel gear 167 on a shaft 168 disposed transverse to the shaft 165. The shaft 168 is also provided with a spur gear 169 disposed in mesh with a gear segment 170 at one end of a rocker plate 171 pivoted at 172.

An opposite end of the plate is formed with an elbow 173 having a roller 174 for engagement with a contact arm 175 carried on a vertical slide rod 176. The arm 175 is provided with a collar 175' pinned to the rod 176 which latter is slidable in bearings 176' and 177. Extending from the bearing 177 is an adjustable stop member 177' so positioned as to engage the roller 174 when in its lower position as will be presently described. A key-way 178 to receive a key in bearing 177 prevents the rod 176 from rotation during its vertical movement. A movement of the slide rod 176 is caused by means of a cam 179 mounted on the crank shaft 26. The said cam engages with a roller 180 at the upper end of the rod 176. The roller 180 is rotatable on a pin 181 in a forked head 182 and a spring 183 disposed between the head and bearing 176' normally urges the rod 176 upwardly while the cam 179 causes a downward movement of the rod.

The base adjusting mechanism D is as above described carried on a bracket 156 which bracket is attached to the slidable head 31 of the pin staking mechanism. When the head 31 descends the end 144 of the adjuster plunger 143 enters a base when disposed at the outlet end 126 of the guide 125.

For the purpose of preventing lost motion during a rotation of the adjuster plunger 143 a friction clutch 184 is provided. This clutch or brake includes a member 185 pivoted at 186. An end 187 of the said member rests on collar 159 and embraces a collar 188 fixed to bushing 157. Spring 189 and 189' holds the member 185 in firm contact with the collar and bushing respectively. An end 190 of the member 185 is provided with a slot to receive a pin 191 which serves as a guide for the member 185. The brake 184 serves to retard the rotary movement of the plunger 143 and avoids back lash.

In operation the various machine elements are actuated in timed relation so that pins are positioned and bases fed thereto for the staking operation. The hopper 54 may be provided with a quantity of pins 45 which are agitated by a movement of the plunger 56 so that the pins travel down the inclined guides 58 and are individually fed by means of the slide rod 62 to the five guide chutes 59 which are so arranged as to cause the pins to drop into apertures 48 on the conveyor 51. The apertures 51 are arranged in groups and disposed in spaced relation about the periphery of the conveyor which latter is moved intermittently to successively position a group of apertures beneath the guide chutes. The conveyor 51 moves in the direction of the arrow shown in Fig. 2 to bring the group of positioned pins adjacent to base feeding mechanism 111. The bases disposed on the rotatable disc 113 which rotates in the direction of the arrow Y are driven through the guide 125 until they reach the stop 126'. While in this position the jaws 127 and 128 move to engage the base for a forward movement to position the base over a set or group of positioned pins on the conveyor 51.

Prior to a forward movement of the jaws, however, it is necessary to adjust the base about its longitudinal axis so that the apertures in the base will be so positioned as to register with the positioned pins on the conveyor when the base is moved over the pins. For this purpose the adjuster plunger 143 moves downwardly into the positioned base and the plunger is rotated so that a projection 145 engages a lug 142 on the interior of the base and rotates the base to position the apertures thereof.

It will be understood from the foregoing description that the adjuster plunger operates to make more than a single revolution so that no matter where the lug 142 happens to be when the projection 145 engages the same, the final position of the adjuster plunger will bring the apertures of the base in the required positions since the lugs 142 are located in the same definite position on each base. The adjuster plunger after rotating the base moves upwardly and the jaws 127 and 128 move forward to suspend the base above pins positioned in the apertures on

the conveyor. When in this position a presser member 146 moves downwardly to engage the base and move it from between the jaws toward the conveyor so that the shanks 44 of the pins 45 enter the apertures in the base. The conveyor then moves the base and pins to position beneath the pin splitting tools 35 and then beneath the riveting punches 37 so that the pins are permanently secured in the apertures in the bottom wall of the base.

It will be understood that inasmuch as the conveyor is operated in a series of intermittent movements, while the pins are being split by the pin splitting tools another base is being riveted so that with each intermittent movement of the conveyor a base is completely finished insofar as the riveting operation is concerned. The base with the pins riveted therein is then moved to a discharge position and may be ejected in the chute 53. The present mechanism operates to automatically rivet pins in the bottom walls of bases and provides an effective high speed mechanism combining the features of pin feeding, base feeding and adjusting and riveting, thus eliminating a considerable amount of labor and tending to reduce the cost of manufacture.

Although a preferred embodiment of the invention is shown and described herein it is to be understood that modifications may be made therein without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A machine of the class described comprising means for holding a plurality of contact pins in given spaced relation, means for feeding a base having apertures in a wall thereof, means engageable with the interior of said base for adjusting the base, and means for moving the adjusted base to position said contact pins in the said apertures.

2. A base feeding mechanism comprising means for moving a base to a given position, means engageable with the interior of said base to adjust the same about its longitudinal axis, means for receiving said base, and means for moving the adjusted base to said base receiving means.

3. A base adjusting mechanism comprising means for supporting a base having a lug on the interior surface thereof, means engageable with said lug to adjust the base about its longitudinal axis, and means for moving said base from said adjusting means.

4. A machine for adjusting a base having a lug on its interior surface comprising a plunger for entering said base, means on said plunger for engaging said lug, and means for rotating said plunger to cause a rotation of said base about its longitudinal axis.

5. A machine of the class described comprising means for holding a plurality of contact pins in given spaced relation, means for feeding a base having apertures in a wall thereof, a rotary member engageable with the interior of said base, means for moving said member into said base, means for actuating said member to adjust the base, and means for moving the adjusted base to position said contact pins in the said apertures.

6. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced arrangement, means for feeding bases having apertures in walls thereof to receive said supported pins, means intermediate said pin supporting means and said base-feeding means for engaging the interiors of bases, means for actuating said last mentioned means to adjust the base to receive said pins, and means for moving said bases to insert said pins in said apertures.

7. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced arrangement, means for feeding bases having apertures in walls thereof to receive said supported pins, a rotatable member intermediate said pin supporting means and said base feeding means, and means for engaging the interiors of bases to adjust the same to receive said pins.

8. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced arrangement, means for feeding bases having apertures in walls thereof, a plunger member intermediate said supporting means and said base-feeding means for adjusting bases about their axes, and means for moving said adjusted bases to insert said supported pins in the apertures thereof.

9. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced arrangement, means for feeding bases having apertures in walls thereof, a plunger-member intermediate said supporting means and said base-feeding means, means for rotating said plunger-member to adjust bases about their axes, and means for moving said adjusted bases to insert positioned pins in the apertures thereof.

10. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced relation, a base-feeding mechanism for bases having apertures in walls thereof, means for adjusting a base, means for moving a base from said adjusting means to position over pins in said supporting means, and means for moving said base to insert positioned pins in the apertures of said base.

11. A machine of the class described comprising means for supporting a plurality of contact pins in given spaced relation, a base-feeding mechanism for bases having apertures in walls thereof, rotatable means for adjusting a base, means for removing a base from said rotatable means to a position over pins in said supporting means, and means for moving said base to insert positioned pins in the apertures of said base.

12. A machine of the class described comprising means for supporting a plurality of pins in spaced arrangement, base-feeding mechanism for bases having apertures in walls thereof, a rotatable plunger engageable with a base fed from said base-feeding mechanism, means for actuating said plunger to rotate the base to bring the apertures in predetermined positions, means for moving an adjusted base over said pins, and means for positioning the base with said supported pins in said apertures.

13. A machine of the class described comprising means for supporting a plurality of pins in given spaced arrangement, base-feeding mechanism for bases having apertures in walls thereof and lugs on inner walls thereof, a rotatable plunger engageable with a lug in a base fed from said base-feeding mechanism, means for actuating said plunger to rotate the base to bring the apertures in predetermined positions, and means for positioning the base with said supported pins in said apertures.

14. A machine for inserting the ends of contact pins in apertures arranged in a selected spaced relation in the bottom wall of a base, comprising a support for holding contact pins with their ends exposed, means for moving a base adjacent to

said support, means engageable with the interior of the base to arrange the apertures thereof for registry with the ends of said pins, and means for moving the base to insert said ends in said apertures.

15. In a machine for inserting the ends of contact pins in apertures arranged in a selected spaced relation in the bottom wall of a base, comprising a support for holding contact pins with their ends exposed, means for moving a base adjacent to said support, means engageable with the interior of the base to arrange the apertures thereof for registering with the ends of said pins, means for moving said base above said pins, and means for changing the relative positions of said pins and base to insert said pins in said apertures.

16. A machine of the class described comprising means for holding a plurality of contact pins in given spaced relation, means for feeding a base having apertures in a wall thereof, means engageable with the interior of said base for adjusting the base, and means for changing the relative positions of said base and said pins to insert said pins in said apertures.

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