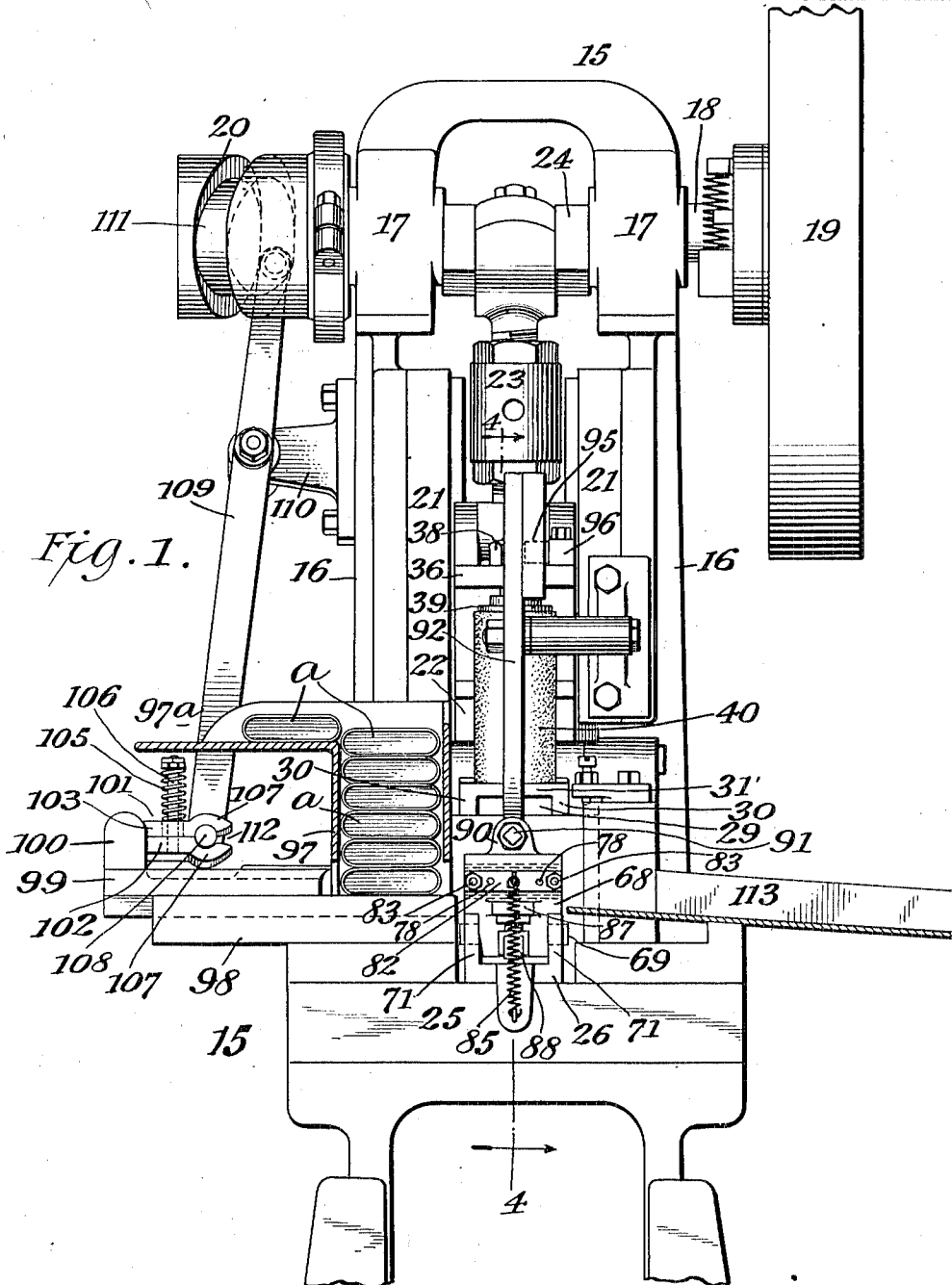


H. F. RICHTER.
SAFETY FEED MECHANISM FOR BEADING MACHINES.
APPLICATION FILED APR. 17, 1913.

1,105,840.

Patented Aug. 4, 1914.

6 SHEETS-SHEET 1.



Witnesses:
A. R. Appleman
J. M. Hawkins

Inventor
Hans F. Richter
By his Attorneys
Meyers, Bushman & Co.

H. F. RICHTER.
SAFETY FEED MECHANISM FOR BEADING MACHINES.
APPLICATION FILED APR. 17, 1913.

1,105,840.

Patented Aug. 4, 1914.

5 SHEETS—SHEET 2.

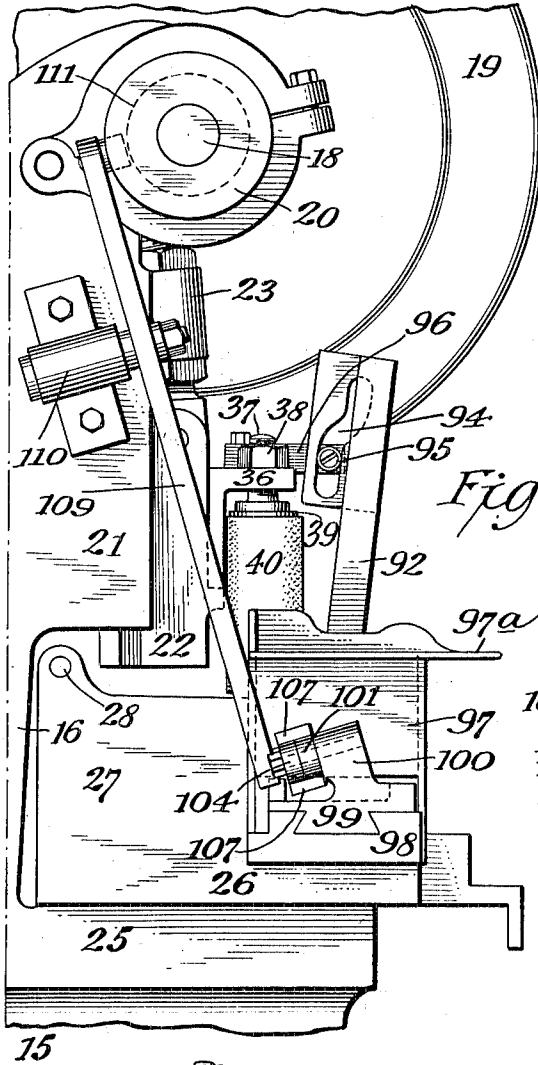


Fig. 2.

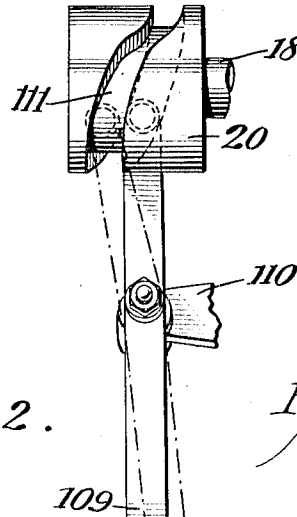


Fig. 3.

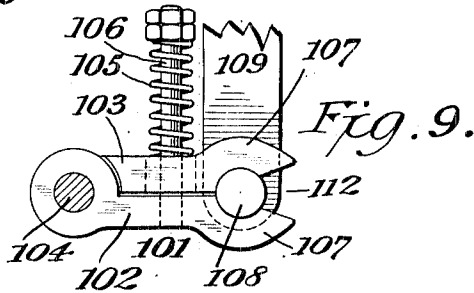


Fig. 9.

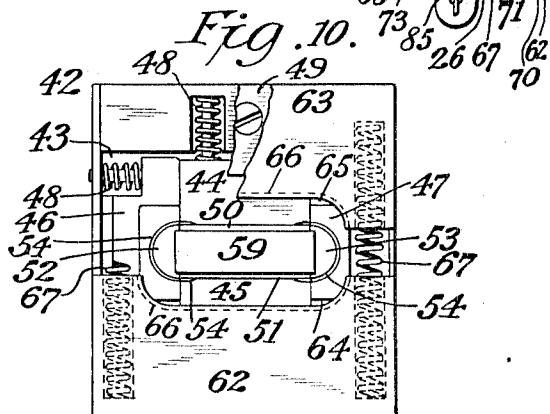


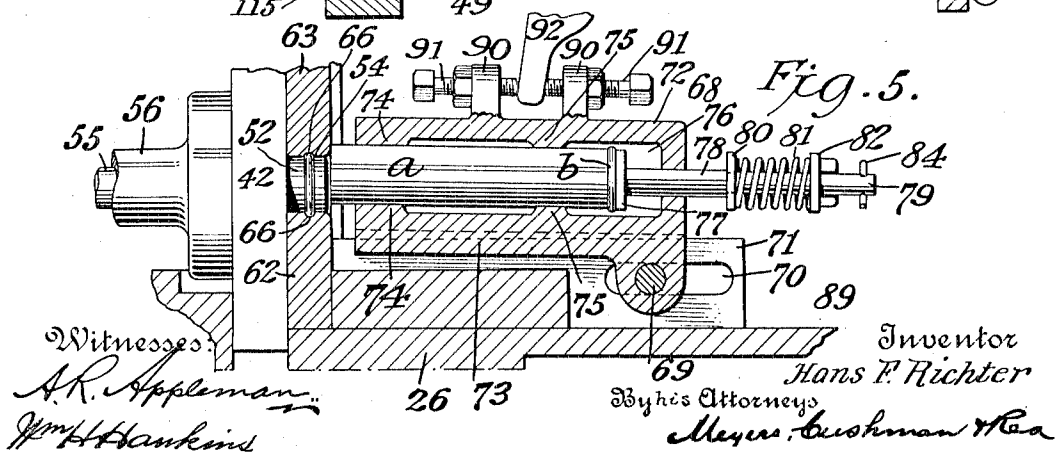
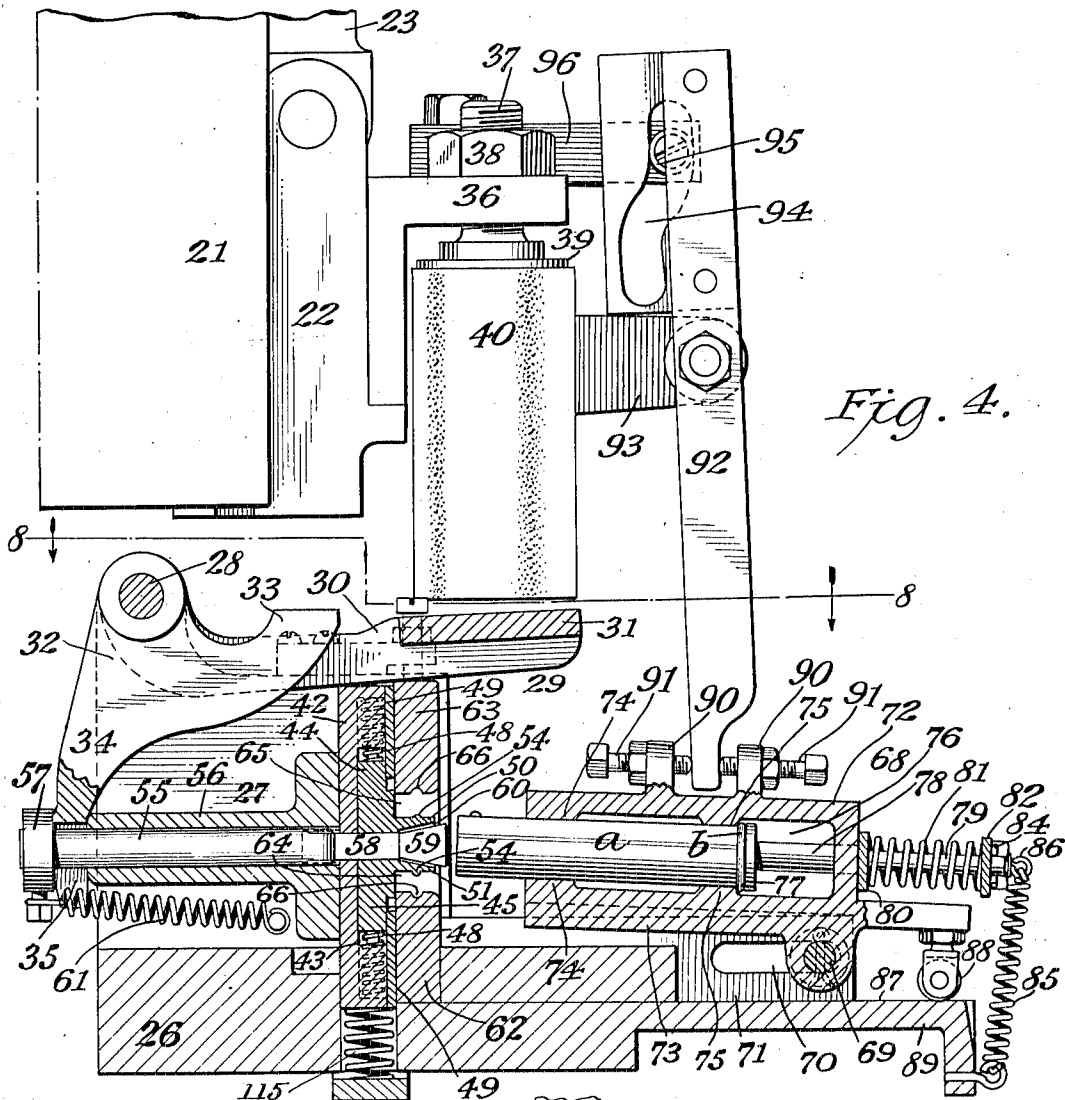
Fig. 10.

Witnesses:
A. R. Appleman
Wm. H. Frank

Inventor
Hans F. Richter
By his Attorneys
Meyers, Bushman & Co.

1,105,840.

5 SHEETS—SHEET 3.

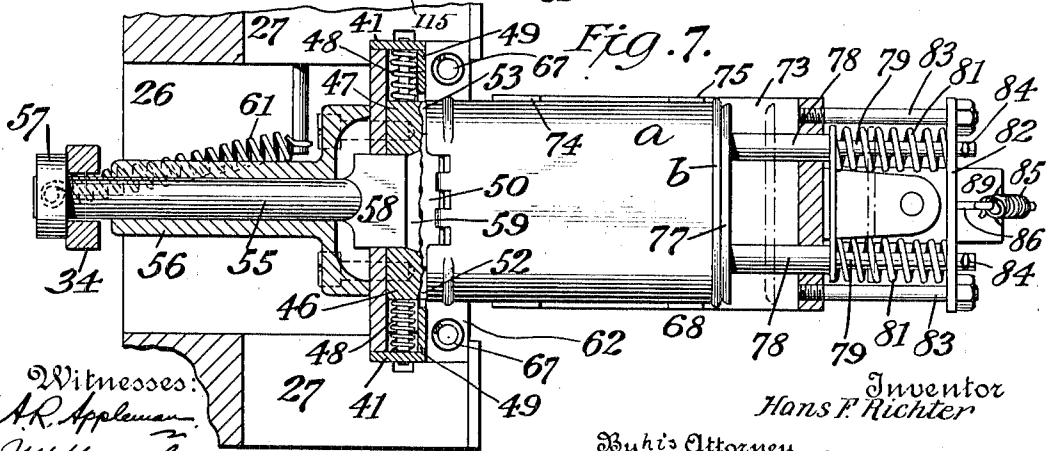
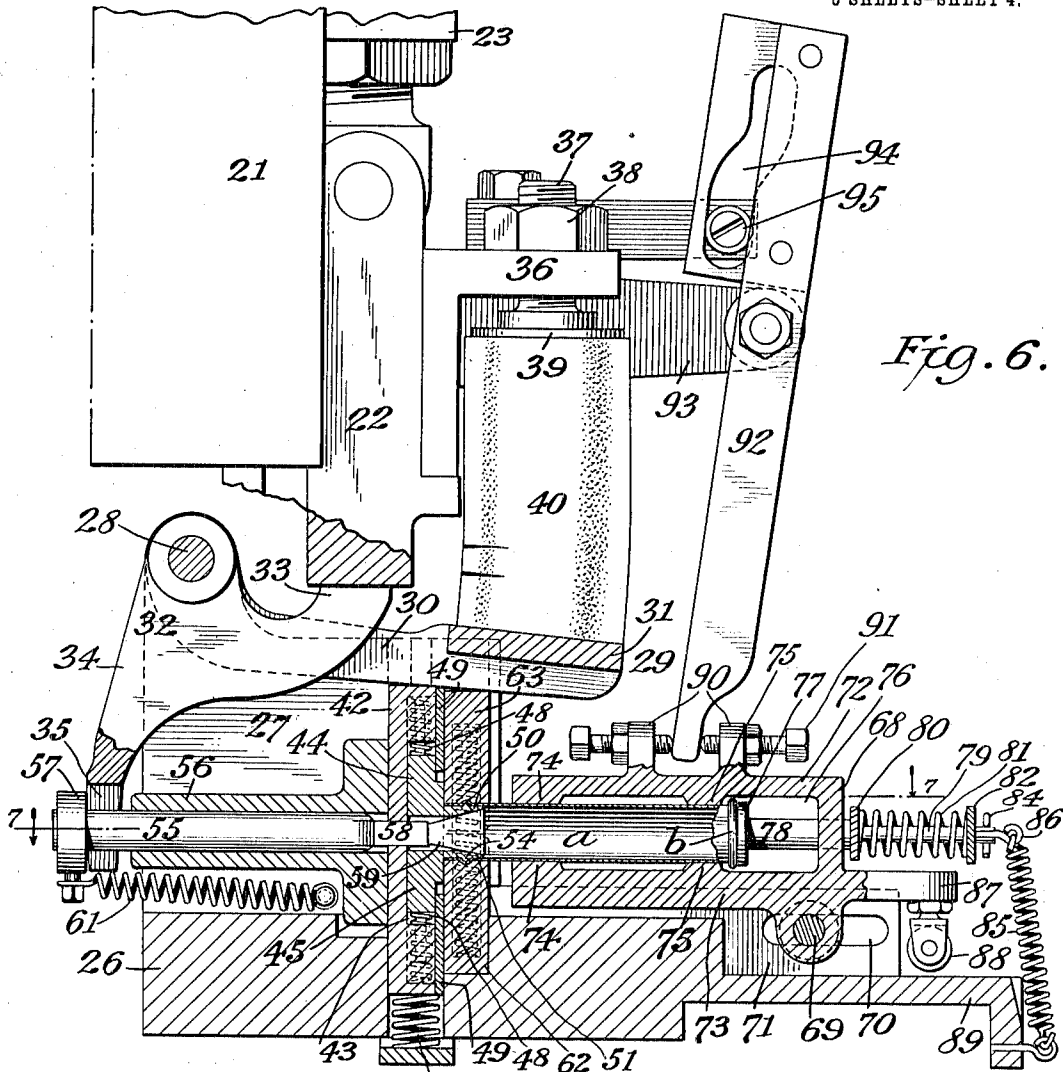


H. F. RICHTER.
SAFETY FEED MECHANISM FOR BEADING MACHINES.
APPLICATION FILED APR. 17, 1913.

1,105,840.

Patented Aug. 4, 1914.

5 SHEETS—SHEET 4.



Witnesses:
A.R. Appleman
W.H. Hankins

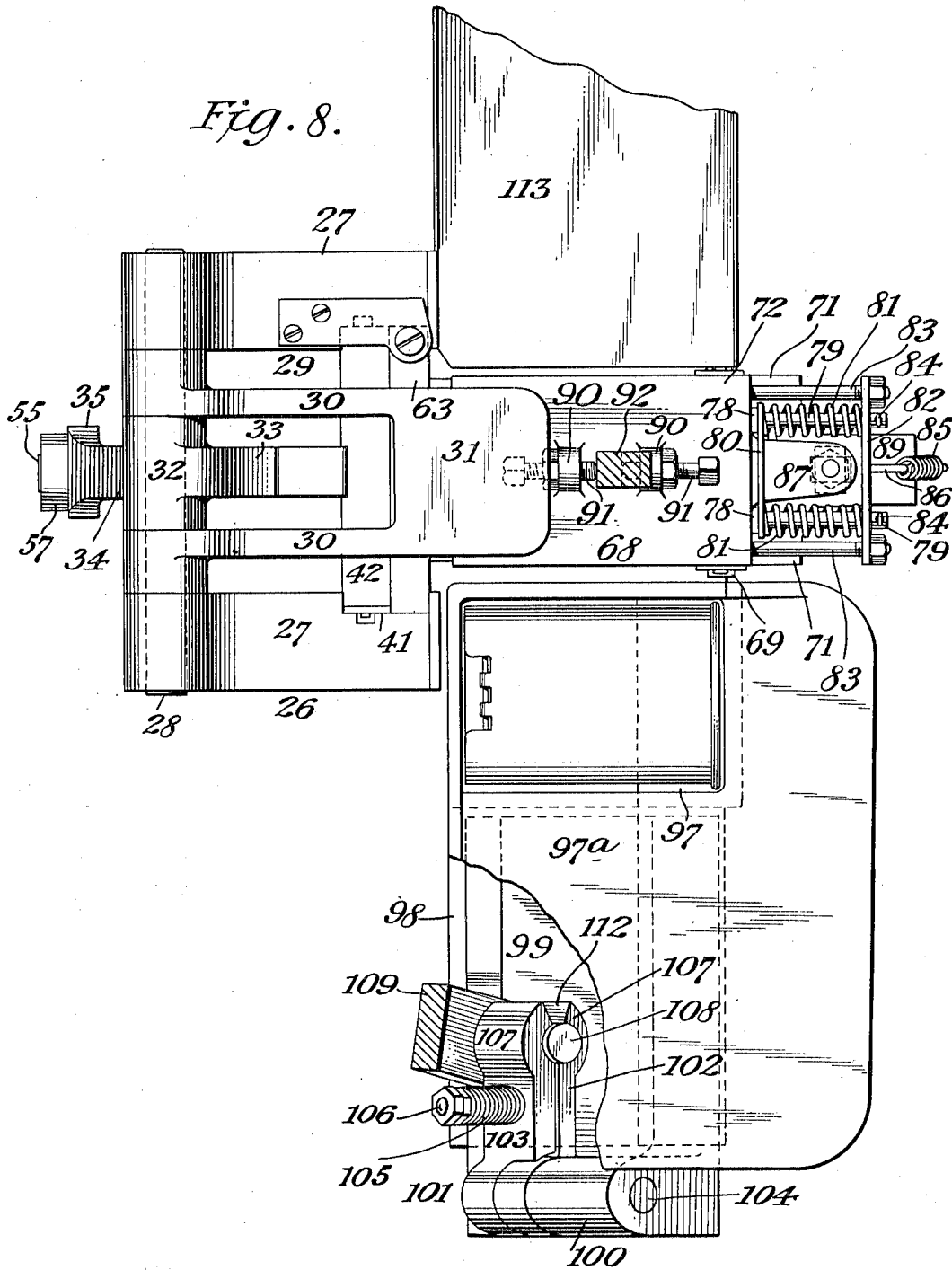
Inventor
Hans F. Richter
By his Attorney
Meyers, Cushman & Kea

H. F. RICHTER.
SAFETY FEED MECHANISM FOR BEADING MACHINES.
APPLICATION FILED APR. 17, 1913.

1,105,840.

Patented Aug. 4, 1914.

5 SHEETS—SHEET 5.



UNITED STATES PATENT OFFICE.

HANS F. RICHTER, OF WINSTON-SALEM, NORTH CAROLINA, ASSIGNOR TO R. J. REYNOLDS TOBACCO COMPANY, OF WINSTON-SALEM, NORTH CAROLINA, A CORPORATION OF NEW JERSEY.

SAFETY FEED MECHANISM FOR BEADING-MACHINES.

1,105,840.

Specification of Letters Patent.

Patented Aug. 4, 1914.

Application filed April 17, 1913. Serial No. 761,837.

To all whom it may concern:

Be it known that I, HANS F. RICHTER, (having renounced his allegiance to the Emperor of Germany and duly declared his intention to become a citizen of the United States, and in this sense is a citizen of the United States,) residing at Winston-Salem, in the county of Forsyth and State of North Carolina, have invented new and useful Improvements in Safety Feed Mechanism for Beading-Machines, of which the following is a specification.

This invention relates generally to machines for forming beads and other ornamental designs in relief or intaglio on hollow articles made of thin or sheet material, and particularly to a machine for forming beads on or near the open ends of tin plate boxes such as are used as containers for smoking tobacco.

The primary object of the invention is to provide an automatic box feeding mechanism for a bead forming machine, and safety devices in connection with the box feeding mechanism that, if through some defect in the feeding mechanism or deformation of the box, the latter fails to be properly positioned with relation to the beading dies, will prevent said beading dies from operating, or disengage the connection between the feeding mechanism and its operating means. Machines of this type, so far as shown, are fed by hand and many boxes are improperly beaded owing to carelessness or neglect on the part of the operator, and must either be thrown away or straightened by hammering out the incorrect bead and once more put through the machine. By means of this invention improper beading is rendered impossible as unless the box is in its true position the beading mechanism cannot operate thereon and the box is ejected from the machine without defacement.

In the accompanying drawings, Figure 1 is a front elevation of a beading machine, with the improvements applied thereto. Fig. 2 is a side elevation of a portion of said machine on an enlarged scale. Fig. 3 is an elevation partly in section of the blank feeding mechanism. Fig. 4 is a vertical sectional view of the machine on the line 4—4, Fig. 1. Fig. 5 is a vertical sectional view through the blank holder and

beading dies, showing the blank in a safety position and prevented from engaging with said dies. Fig. 6 is a view similar to Fig. 4, the parts being shown in a different position. Fig. 7 is a horizontal sectional view on the line 7—7, Fig. 6. Fig. 8 is a horizontal sectional view through the machine on the lines 8—8, Fig. 4. Fig. 9 is a detail view of the safety connection forming a part of the blank feeding mechanism. Fig. 10 is a front elevation of the beading dies.

In the drawings wherein like reference characters are used to designate the same parts in all the figures, 15 indicates the frame generally, having two parallel upright standards 16 on each of which is a bearing 17 for a driving shaft 18 carrying on one end a belt pulley 19 and on the other end a cam drum 20. Guides 21 are formed on the standards 16 for a head or plunger 22 vertically movable therein by means of a pitman 23 pivoted thereto and connected to a crank 24 on the driving shaft 18.

Fastened to the top plate 25 of the machine is a bearing bracket 26 from the rear end of which rise two cheek plates 27 with bosses on their upper ends to support a cross shaft 28 on which rocks a lever 29 comprising two spaced arms 30 parallel to each other and a connecting plate 31 between their outer ends. Between the arms of the lever 29 and also movable about the shaft 28 is a bell crank lever 32 one of its arms 33 projecting in a forward direction beneath the head or plunger 22 and its other arm 34 extending downwardly with a fork at its lower end.

Secured on the front of the head or plunger 22 is an angle plate 36 in which is mounted a threaded stem 37 secured by a jamb nut 38. The lower end of the stem is enlarged or has a plate 39 fastened thereon from which a resilient cushion 40 depends. This cushion is preferably made of a rubber cylinder, but may be a coil spring or other equivalent means. In the inactive position of the parts shown in Fig. 4, the lower end of the cushion 40 is separated a short distance from the connecting plate 31 of the lever 29 to permit the head or plunger a certain amount of independent movement before the cushion encounters the lever 29 and rocks it.

Slidably mounted in vertical guide-ways 41 in the cheek plates 27 is a bead die carrier 42 comprising an upright rectangular plate in the front of which is made a rectangular cavity 43 for the reception of the several sections of the die. In the present case, the die comprises upper and lower sections 44, 45 respectively, and two lateral sections 46, 47. These sections are independently slidable in the carrier 42, springs 48 tending to press them constantly toward the center of the carrier. Cover plates 49 screw-fastened on the front of the carrier retain the die sections within the cavity 43 of the carrier.

Extending in a forward direction from the inner edge of each die section 44, 45, 46 and 47 is a projection or lug indicated respectively by the numerals 50, 51, 52, and 53, said projections having collectively an outline similar to the interior shape of the blank to be beaded. On the outside of each projection is a raised portion 54 in the form of a bead or other design to be impressed on the blank. Normally the die sections and their beaded projections are held by the springs 48 in their innermost position, and in this position said projections are sufficiently close together to freely enter the blank, but are spread apart to form the bead on the blank *a* by a horizontally sliding pin 55 movable longitudinally in a sleeve bracket 56 attached to the rear of the carrier 42 and provided with a collar 57 on its outer end against which the arm 34 of the bell crank lever presses, the fork 35 on said arm straddling the pin 55. The inner end of the pin has a flat rectangular neck 58 that slides through a similarly shaped opening in the carrier 42 and between the inner edges of the die sections, and terminates in a pyramidal head 59 wider at its forward end. The head 59 is disposed within a similarly shaped seat 60 within the projection 50, 51, 52 and 53, one side of said seat being formed in each projection. The pin 55 and bell crank lever 32 are normally held in a forward position by a spring 61 connected to the collar 57 and to a fixed part of the frame.

In front of the carrier 42 is the cooperating female die comprising a lower fixed member 62, and an upper sliding member 63, said members having their facing edges recessed as at 64, 65, said recesses being of such shape that when the members 62, 63 are brought together, the two recesses will conform to the external outline of the blank. Within each recess is a groove 66 to cooperate with the bead or other shaped elevation 54 on the die projections 50—53. The sliding die member 63 is normally held above the die projections 50—53 by springs 67 seated in openings bored in the lower and upper die members as shown. The carrier 42 is also held in its upper position by a

spring 115, in which position the die projections 50—53 will be above the lower die member and about midway the recesses 64, 65.

The lever 29 bears on the top of the carrier 42 and the sliding die member 63, so that when the descending cushion 40 engages the lever 29 and depresses it, the carrier and the die member will be moved downward carrying with it the blank which has been placed on the projections 50—53. These parts descend until the aforesaid projections with the blank thereon bear upon the lower die member 62 and the upper die member 63 rests upon the blank on the upper side of said projections. The carrier 42 and sliding die member are now arrested in their downward movement and the lever 29 brought to a stop. The plunger 22, however, which has a short distance further to travel at this point comes in contact with the arm 33 of the bell crank lever 32 and rocks it, drawing the pin 55 rearwardly. The pyramidal head 59 of the pin is by this movement forced against the inclined surfaces of the seat 60 in the die projections 50—53 and spreads them apart compressing the springs 48 and forcing the bead thereon and the material of the blank into the grooves 66 of the die members 62, 63. The cushion 40 is compressed during the final downward movement of the plunger and, pressing on the lever 29, holds the carrier and the sliding die member 63 immovable during the formation of the bead.

As thus far described, the blanks *a*, which in the present instance are tin containers for smoking tobacco, may be fed to the beading dies by hand, the open ends of the containers being slipped over the die projections 50—53. This method of feeding however results in an unnecessarily large percentage of loss by improper or irregular beading, due to deformation of the blank or carelessness, indifference and other causes on the part of the operator. To overcome this loss, an automatic feeding mechanism is applied to the machine provided with safety devices which prevent the beading dies operating on the blank unless the latter is properly positioned with relation to the dies.

The feeding mechanism comprises a holder 68 mounted in front of the beading die upon a hinge pin 69, the ends of which pin project laterally into horizontal slots formed in uprights 71 on the front of the bracket 26, thus permitting the holder to swing vertically and move in a longitudinal direction to and from the beading die.

The holder consists principally of an upper plate 72 and a lower plate 73 connected at the front and open at the rear and each side. The top and bottom plates are parallel and spaced apart a distance greater than the thickness of the blank *a* with ribs 74, 75

projecting from the inner sides of the plates between which the blank is held. The open end of the blank projects a short distance from the rear of the holder as shown.

5 Within the space 76 between the two plates of the blank holder 68 and in front of the ribs 75 is a transverse plate 77 supported on two rods 78 that slide through holes in the closed front of the holder. Outside the
10 holder the rods are reduced in diameter as at 79 forming a shoulder on each rod against which a plate 80 is pressed by two springs 81, each spring surrounding the reduced portion of one of the rods and bearing at
15 their outer ends against a second plate 82 supported on two fixed pins 83 screwed into the holder 68. Nuts screwed on the pins 83 in front of the plate 82 retain it in place and also serve to adjust the tension of the
20 springs. The ends of the rods 78 slide in holes in the plate 82 and are limited in their rearward movement by stop pins 84. The plate 77 within the holder has its ends beveled or rounded as shown in Fig. 7, and,
25 when the holder is empty, said plate lies close to or against the sides of the ribs 75 and the plate 80 bears on the front of the holder. When a blank is fed into the holder 68, the bottom thereof on which is a flange
30 or bead *b*, passes between the ribs 75 and the plate 77, slightly compressing the springs 81 which hold the flange *b* of the blank in contact with said ribs. The rear of the holder 68 is elevated by a coil spring 85 fastened at one end to a fixed part of the frame
35 and at its other end on an eye 86 carried by the plate 82. The elevation of the holder is limited by a forwardly projecting lug 87 thereon provided with a bearing roller 88 which runs on a shelf 89 extending from the
40 bracket 26.

On the top of the holder 68 are two ears or lugs 90 through each of which is screwed a bolt 91, their inner ends bearing against
45 opposite sides of the lower end of a swinging lever 92 pivoted intermediate its ends on a bracket 93 projecting forwardly from one of the standards 21. The upper end of the lever 92 is provided with a cam slot 94
50 in which runs a roller 95 pivoted on an arm 96 bolted on the angle plate 36 and movable with the head or plunger 22. The purpose of this lever will be described later.

At one side of the holder 68 is a fixed vertical hopper 97 kept constantly filled with
55 blanks *a* from a table 97^a at the top of the hopper on which table the blanks are placed and inserted in the hopper by hand. Below the hopper 97 and slidable thereunder in
60 guides 98 fixed on the top plate 25, to and from the holder 68, is a blank feeding plate 99, the inner end of which engages the lowermost blank in the hopper and pushes it laterally into the holder. On the outer end

of the feeding plate 99 is an upstanding lug 65 100 which carries a safety clamp 101 comprising two parallel arms 102, 103 pivoted on a pintle 104 projecting from the lug and held together by a spring 105 surrounding
70 a pin 106 fixed to the arm 102 and projecting through a hole in the arm 103. An adjusting nut on the outer end of the pin regulates the tension of the spring which bears at one end against said nut and at its other
75 end against the arm 103. The outer or free ends of the arms 102, 103 terminate each in a jaw 107 with a segmental seat that together grasp and hold a projecting pin 108 on the lower end of an upright lever 109 rocking
80 on a bearing bracket 110 bolted against one of the standards 21. The upper end of the lever carries a roller that travels in a cam groove 111 in the drum 20 fixed on the main shaft. An outwardly spreading mouth 112
85 leads from the ends of the jaws 107 to the seat for the pin 108 so that it is only necessary when the lever 109 is disengaged from the safety clamp 101, to place the pin 108 in said mouth against the tapering sides thereof and then by a forcible push, separate
90 the jaws and seat the pin, the spring 105 closing the jaws after the pin is in place.

In the operation of the machines, blanks
95 *a* are placed on the table 97^a and an operator keeps the hopper 97 filled with them. Each rotation of the shaft 18 and cam drum 20 rocks the lever 109 and causes the blank feeding plate 99 to push the lowermost
100 blank in the hopper, laterally into the holder 68, the bead or flange *b* on the blank passing between the ribs 75 and the yielding plate 77. Should, through misplacement, deformity, or other cause, the blank fail to enter the holder, the advancing feeding
105 plate pressing against the arrested blank would crush the same were not means provided to protect the blank. This means consists of the safety clamp 101 which springs
110 open when the pressure on the blank is excessive and permits the pin 108 to escape from the clamp. After the blank has entered the holder 68, its open end projects from the rear of the clamp as in Fig. 4 and
115 owing to the angular position of the holder, the blank lies with its open end slightly elevated, close to and in line with the die projections 50—53. The head or plunger 22 now begins to descend carrying with it the cushion block 40 and the arm 96 and roller
120 95. The cushion block has a limited movement before acting on the arm 29 and during this movement the roller 95 running in the cam groove 94 on the lever 92, swings said lever in a direction to cause it to slide
125 the holder rearwardly, and place the open end of the blank over the die projections 50—53. If from any cause the blank fails to engage the die projections, its open end

will strike said projections, or one of the die members 62, 63, as in Fig. 5, and as the holder is moved toward the die, the blank being arrested will slide in the holder, pushing the plate 77 toward the front of the holder and compressing the springs 81. The blank being thus held outside the dies, no false beading will be impressed on the blank when the dies close. On the return of the holder to normal position, the blank will be pushed rearwardly by the springs into its initial position ready to be ejected. As soon as the blank has been placed on the die projections 50—53, the cushion block 40 encounters the lever 29 and rocks it to depress the beading mechanism, as hereinabove described. The downward movement of the beading mechanism also causes the blank and its holder to rock on its fulcrum pin 69 as is evident. The blank is now beaded as described, after which the plunger rises, the blank holder is returned to receiving position, and the beading dies separate. Another blank is fed to the holder and as it enters, the finished blank is pushed out upon a trough 113 from which it falls into a suitable receptacle.

What I claim is:—

1. In a machine for beading metallic receptacles, the combination with opposed beading dies movable toward and from each other in a straight line, of a receptacle holder adapted to travel to and from said dies to insert thereinto and withdraw therefrom a receptacle projecting from said holder, said holder having open sides into and out of which the receptacle is inserted and removed, and an open end from which one end of the receptacle projects, means for feeding receptacles into one of the open sides of said holder and discharging them from the opposite open side, and a separable member forming a part of said feeding means adapted to disconnect when a receptacle fails to align with the inlet opening in the side of the holder.

2. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder adapted to travel to and from said dies to engage a blank therewith and be moved thereby, means for feeding blanks to the holder, a separable member forming a part of said feeding means adapted to disconnect when a blank fails to enter a holder, and yielding means carried by the holder to permit the blank sliding therein whenever it fails to enter the dies.

3. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder adapted to be traversed positively to and from said dies and be moved by said dies at a right angle to its line of traverse for engaging a blank with said dies to be beaded and removing the

same therefrom, and yielding means carried by said holder to prevent misplacement of the blank within the dies.

4. In a beading machine, the combination with beading dies movable in a straight line, of a blank movable in two directions at a right angle to each other for placing a blank within said dies and for removing the same, and yielding means carried by the holder to contact with said blank and permit the latter to slide within said holder during the advance of the holder whenever said blank is prevented from entering the dies.

5. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder adapted to reciprocate to and from said dies to engage a blank therewith and be moved thereby when so engaged in a direction perpendicular to its line of reciprocation, means for reciprocating said blank holder, and means for feeding blanks to the holder.

6. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder adapted to reciprocate to and from said dies to engage a blank therewith and be moved thereby when so engaged in a direction perpendicular to its line of reciprocation, means for reciprocating said blank holder, and means for feeding blanks to the holder, and a separable member forming a part of said feeding means adapted to disconnect when a blank fails to enter the holder.

7. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder mounted on a sliding hinge pin adapted to reciprocate horizontally to and from said dies to engage a blank therewith and be rocked thereby when so engaged in a vertical direction, means for reciprocating said blank holder, a slide for feeding blanks to said holder, and means including a separable connection for actuating said slide.

8. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder adapted to travel to and from said dies to engage a blank therewith and be moved thereby, stops within said holder to limit the projection of the blank from the rear thereof, and yielding means for normally holding the blank against the stops and permitting it to slide within the holder as the latter advances toward the beading dies should said blank fail to properly enter said dies.

9. In a beading machine, the combination with beading dies movable in a straight line, of a blank holder pivoted to rock vertically and slide longitudinally in bearings, means acting directly on said holder to insert a blank in the beading dies and withdraw the same therefrom, said holder being

rocked by the engagement of the blank and die, and yielding means for positioning the blank and permitting it to move relatively to the holder when prevented from entering the die.

10. In a beading machine, the combination with a reciprocating plunger, beading dies movable in a straight line, and means actuated by the plunger for moving said dies, of a blank holder arranged to travel rectilinearly to and from said dies to feed a blank thereto, and means operated by the plunger for traversing said holder.

11. In a beading machine, the combination with beading dies of a blank holder therefor open at each side to receive and discharge a blank, and also open at its rear end through which said blank projects toward the beading dies, stop ribs within the holder to limit the projection rearwardly of said blank, and yielding means for holding said blank against the stop ribs and permitting it to slide relatively to said holder.

12. In a beading machine, the combination with inner and outer beading dies, a holder for blanks or boxes movable to and from said dies formed with an opening therein from side to side for the entrance thereinto of blanks or boxes to be beaded and ejection therefrom, means for feeding blanks or boxes to said holder, a separable device forming a part of said feeding means that disconnects when a blank or box fails to enter the holder, and a yielding support on the holder to bear against the blank or box and permit the same to slide should it fail to enter the dies.

13. In a beading machine, the combination with inner and outer beading dies movable in a straight line, a holder for blanks or boxes movable to and from said dies and pivotally mounted to move with the dies when a blank or box is in position to be beaded, said holder being formed with an

opening therein from side to side for the entrance thereinto of blanks or boxes to be beaded and ejection therefrom, means for feeding blanks or boxes to said holder, a separable device forming a part of said feeding means that disconnects when a blank or box fails to enter said holder, and a yielding support on the holder for said blank or box to permit the same to slide therein should it fail to enter the dies.

14. In a beading machine, the combination with beading dies movable in a straight line, of a holder for blanks or boxes to be beaded open from side to side and at one end for the entrance thereinto and exit therefrom of said blanks or boxes, means for transversing said holder to and from said dies to insert the box or blank thereinto, and a yielding support in said holder for the bottom of said box or blank to permit sliding of the latter into the holder should it fail to enter the dies.

15. In a beading machine, the combination with separable inner beading dies, separable outer beading dies coöperable with the inner dies, said dies movable toward one another, positive means for contracting the outer dies, positive means for independently expanding the inner dies, a plunger provided with means for separately operating the die actuators, a holder for a box or blank to be beaded, means also operated by said plunger for moving said holder to insert and withdraw a box or blank from the dies, and yielding means carried by said holder to permit said box or blank to move therein should it fail to enter the dies.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HANS F. RICHTER.

Witnesses:

LEWIS F. BROWN,

MATT SMITH.