Nov. 16, 1943. R. J. BOEDIGHEIMER 2,334,241

COUNTING MACHINE

Filed June 17, 1942 3 Sheets-Sheet 1

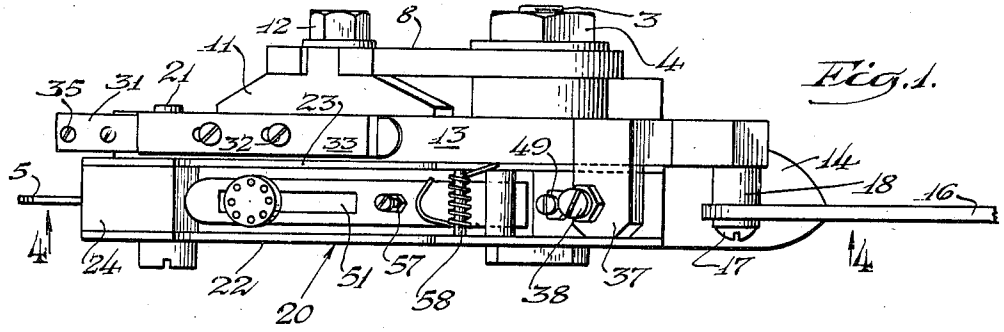


Fig. 1.

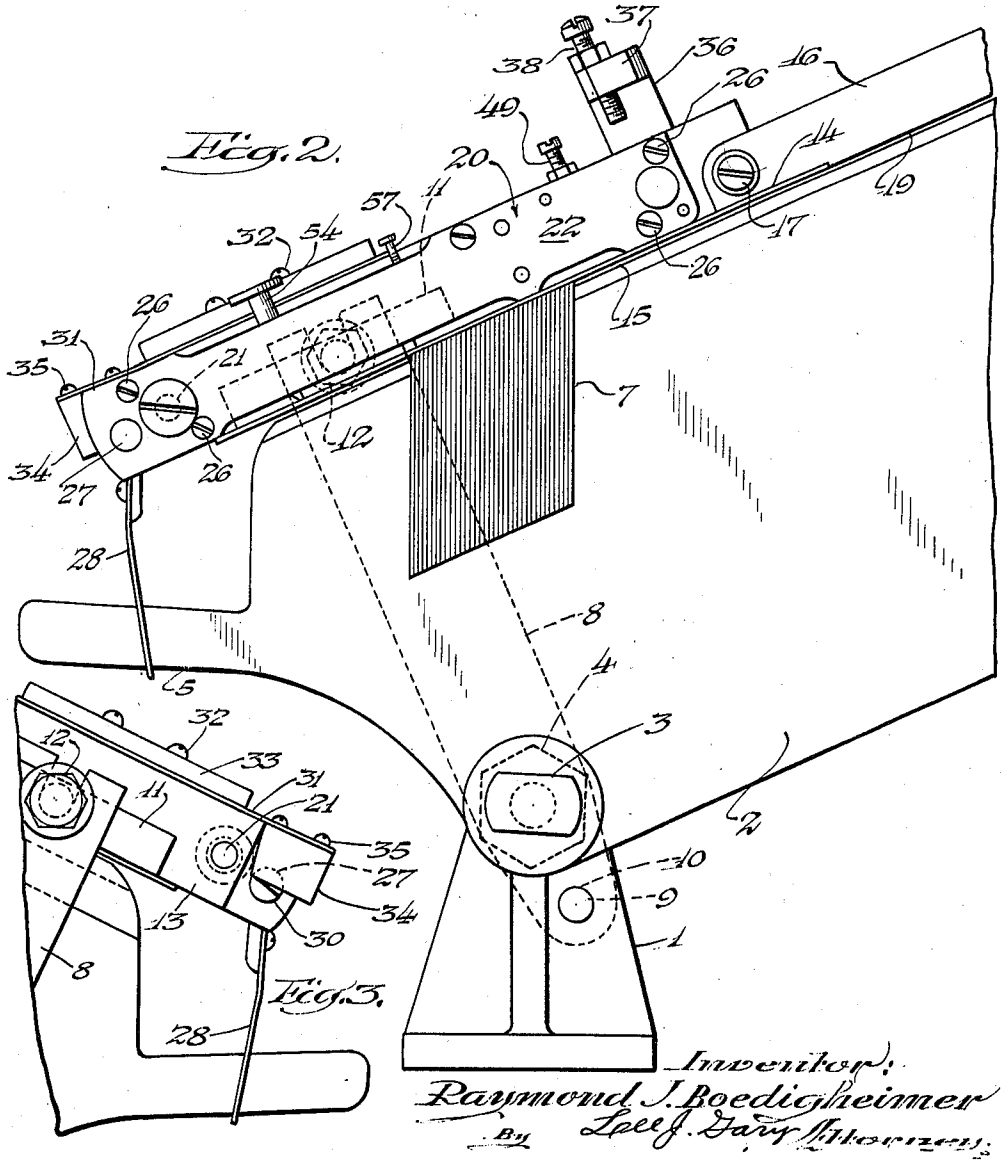


Fig. 2.

Fig. 3.

Inventor:
Raymond J. Boedigheimer
By Lee J. Darby Attorney

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Fig. 4.

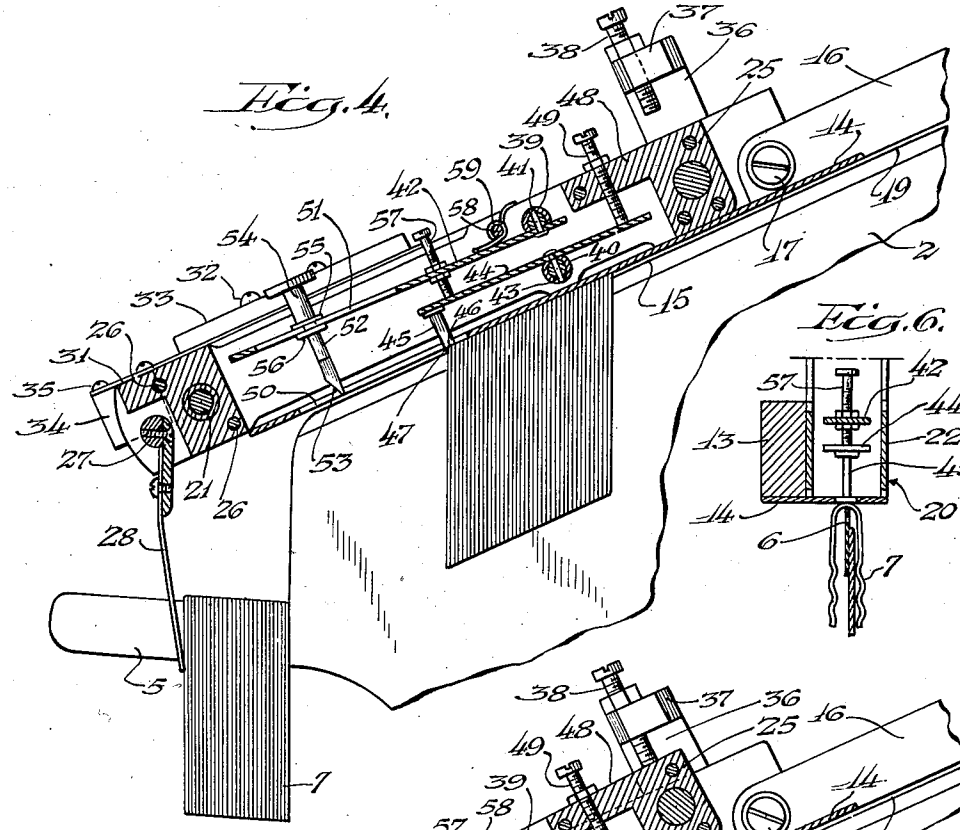


Fig. 6.

Fig. 5.

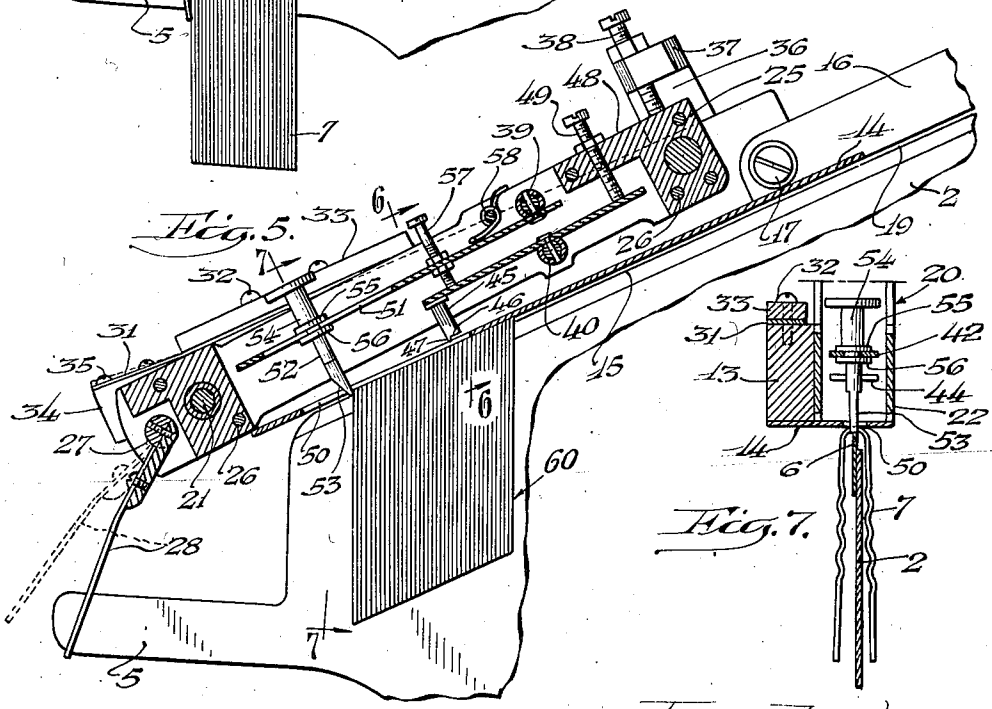


Fig. 7.

Inventor:
Raymond J. Boedigheimer
By Lee J. Gary
Attorney.

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Fig. 8.

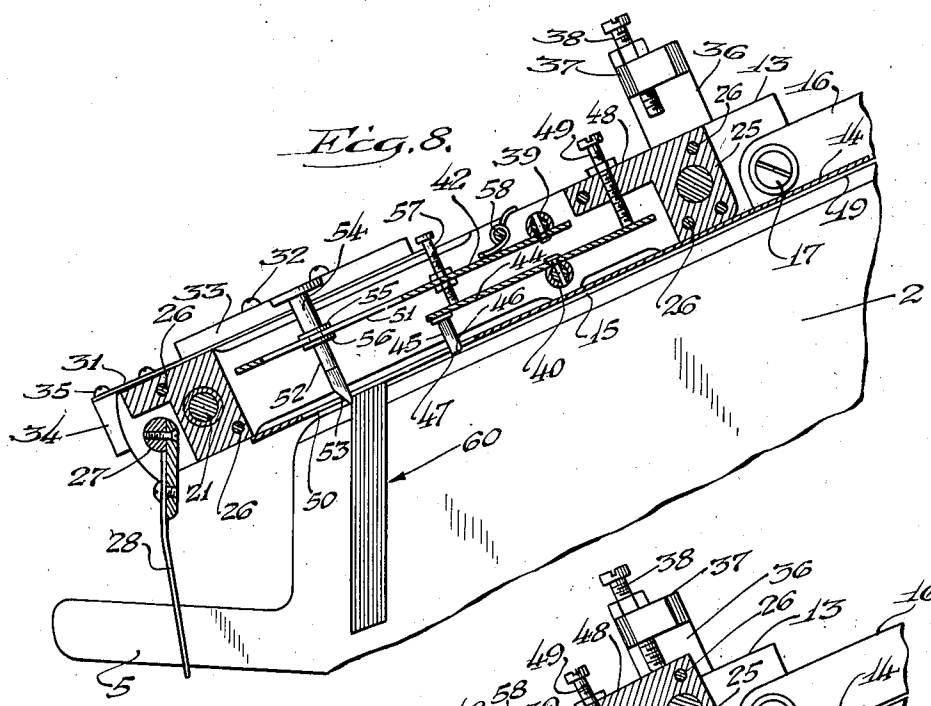


Fig. 9.

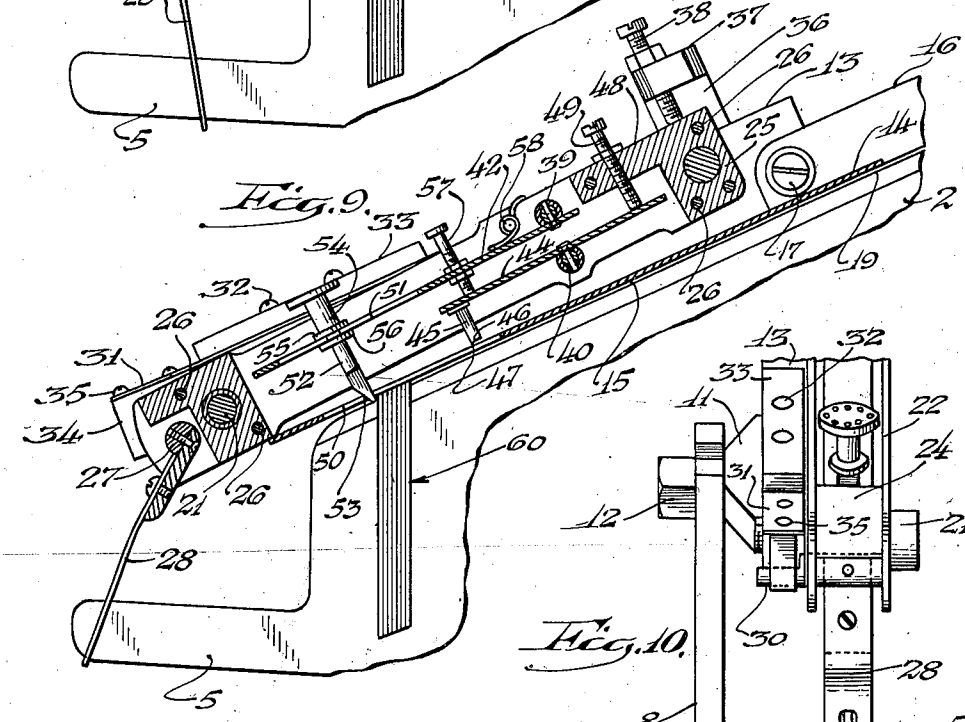


Fig. 10.

Inventor:
Raymond J. Boedigheimer
By Lee J. Gary
Attorney.

Patented Nov. 16, 1943

2,334,241

UNITED STATES PATENT OFFICE

2,334,241

COUNTING MACHINE

Raymond J. Boedigheimer, Chicago, Ill., assignor to Chain Store Products Corporation, Chicago, Ill., a corporation of Delaware

Application June 17, 1942, Serial No. 447,426

8 Claims. (Cl. 163—8)

This invention relates to improvements in a hairpin counting and discharging device, and refers specifically to a hairpin counting and discharging device which discharges a predetermined number of hairpins at a time and in the event that a lesser number of hairpins are supplied to the counting zone, the discharging mechanism is rendered inoperative.

My present invention is an improvement upon a portion of the invention described in United States Letters Patent No. 1,326,925 to S. H. Goldberg, and is adapted to be employed in the machine described in said patent in place of the hairpin counting and discharging device therein described.

In the operation of the counting and discharging device described in the Goldberg patent, supra, a counting zone is provided which is adapted to accommodate a predetermined maximum number of hairpins. In the operation of the device the zone is periodically emptied by the operator by means of a suitable discharging means. However, in the event that a number of hairpins less than the capacity of the counting zone is disposed in the counting zone when the discharge mechanism is actuated, said lesser number of hairpins will be discharged.

In the present invention, a counting zone is provided to accommodate a predetermined maximum number of hairpins. However, mechanism is provided whereby the discharge device will be rendered inoperative if a lesser number of hairpins is supplied to the counting zone, and the short-numbered group of hairpins in the counting zone will not be discharged thus eliminating the possibility of an operator packing an insufficient number of hairpins in a package or box.

Other objects and advantages of my invention will be apparent from the accompanying drawings and following detailed description.

In the drawings,

Fig 1 is a top plan view of my improved hairpin counting and discharging device.

Fig. 2 is a side elevational view of the device shown in Fig. 1.

Fig. 3 is a fragmentary detailed elevational view of the discharge actuating cam.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 1, showing a proper numbered group of hairpins just discharged from the counting zone, the latter being empty.

Fig. 5 is a similar view showing the counting zone completely filled with hairpins.

Fig. 6 is a transverse sectional view taken on the line 6—6 of Fig. 5 showing the discharge control feeler.

Fig. 7 is a transverse sectional view taken on line 7—7 of Fig. 5 showing the discharge control pin.

Fig. 8 is a sectional view similar to Fig. 4 illustrating the counting zone carrying an insufficient number of hairpins to actuate the discharge feeler.

Fig. 9 is a similar view, illustrating the discharge cam in discharge position.

Fig. 10 is a fragmentary front elevational view of the discharge end of the device.

Referring in detail to the drawings, 1 indicates a supporting standard or foot which is adapted to carry a plate 2, the plate being secured to the standard by means of bolt 3 threadedly engaged by nut 4. The plate 2 is of relatively flat construction and only the forward portion thereof is illustrated in the drawings. Means (not shown) is also provided for supporting the rear portion of the plate. The longitudinal axis of the plate 2 is disposed at an oblique angle to the horizontal and the front portion of the plate is provided with a discharge arm 5 which extends substantially horizontal when the plate is disposed at its proper angular position. A relatively thin blade 6, Figs. 6 and 7, is secured to the upper portion of the plate 2 by welding or other suitable attaching means.

As described in the Goldberg patent hereinbefore identified, the plate 2 is adapted to function as a guide and in the patented machine means is provided for disposing hairpins 7 upon the plate 2, the hairpins being positioned upon the plate with the legs of the pins straddling the plate, and the U-bent portion of the pins being supported upon the upper edge of the blade 6. The angle of inclination of the plate 2 is such that hairpins positioned at the upper portion thereof slide by gravity downwardly toward the forward end of the plate.

A bar 8 is secured to the standard 1 and extends angularly upwardly at substantially right angles to the longitudinal axis of the plate 2, the bar being secured by means of the bolt 3 and being fixed in angular position by means of pin 9 carried by the standard 1 which projects into an aperture 10 provided in the bar. A spacing member 11 is secured adjacent the upper portion of bar 8 by means of bolt 12 and said spacing member in turns supports a block 13. The block 13 is disposed substantially parallel to the upper edge of the blade 6 and said block carries a relatively elongated platform 14 which is positioned at

right angles to the plane of the plate 2, the platform being disposed immediately above the upper edge of the blade 6, providing a slot 15 between the upper edge of the blade and the lower surface of the platform 14.

A guide bar 16 is secured to the block 13 by means of screw 17, the guide bar being spaced laterally from the block by means of spacer 18 which embraces the shank of the screw 17. The plane of the bar 16 is in substantial alignment with the plane of the plate 2, and the lower edge of said bar is spaced from the upper edge of the blade 6 to provide a space 19. The opposite end of bar 16 is carried by a suitable support (not shown) so as to maintain the bar uniformly spaced throughout its length from the blade 6. The arrangement is such that when the hairpins 7 have been deposited upon the upper edge of the blade 6 as has been hereinbefore described, said hairpins slide downwardly along the upper edge of the blade 6 and are confined in the spaces 19 and 15, thus preventing the U-bend of one hairpin from being jammed above the U-bend of the next adjacent hairpin. In this manner a single row of hairpins is suspended upon the blade 6.

A control element 20 is pivotally secured to block 13, the pivotal attachment comprising a screw 21. The control element 20 comprises a frame having opposite side plates 22 and 23, which are spaced from each other by means of blocks 24 and 25, and are secured to said blocks by means of screws 26. Adjacent one end of the control element 20, a pin 27 is rotatably carried, said pin being rigidly secured to a discharge actuated lever 28, which latter is constructed of a relatively resilient metal strip. The lower portion of the strip 28 is forked as shown best at 29 in Fig. 10, the arms of the forked portion of the member 28 straddling the arm 5. The opposite end of the pin 27 is of semi-cylindrical construction as shown best at 30 in Fig. 3, said semi-cylindrical portion functioning as a cam when the lever 28 is rocked about the pivot pin 27.

Blade spring 31 is secured to the block 13 by means of screws 32, said screws extending through a retaining member 33. A portion of the spring 31 overhangs the end of block 13 and carries a cam follower member 34 which is secured to the overhanging portion of the spring 31 by means of screws 35. The arrangement is such that when the arm 28 is rocked in a counterclockwise direction, Fig. 3, about the pivot pin 27, the cam 30 bears upon the lower face of the cam follower 34. A force is thus exerted tending to move the cam follower and the cam laterally with respect to each other. In view of the fact that the cam follower is secured to the spring 31, which in turn, is secured to the rigidly positioned block 13, the major portion of the lateral movement is taken up by the pin 27 which is carried upon the end portion of the control element 20. Hence, the control element 20 is rocked about the pivot 21 in a clockwise direction, Fig. 3. An arm 36 is carried upon block 13 and is provided with a lateral extension 37 which overhangs the control element 20. A set screw 38 is threadedly positioned in the overhanging member 37 and the end of said screw functions as a stop for the control element 20 when the same is rocked.

The control element 20 carries a pair of transversely disposed rotatable shafts 39 and 40 which are journalled in the walls 22 and 23, said shafts being disposed one above the other. Rigidly secured to the shaft 39 by means of pin 41 is a lever 42 which is secured to said shaft adjacent one end thereof. The lever 42 is preferably constructed of substantially rigid material. Secured to the shaft 40 by means of pin 43 is a lever 44 which may be constructed of a substantially rigid material. The lever 44 is secured to the shaft 40 at substantially its midportion.

A pin 45 is secured to the lever 44 adjacent one end thereof, said pin extending downwardly from the lever. The lowermost end of the pin 45 is substantially flat as indicated at 46 in Fig. 5, but adjacent one side thereof the pin 45 terminates in a point 47. Threadedly positioned in an overhanging portion 48 of the block 25 is a set screw 49, the lower end of which is adapted to bear upon the upper portion of the lever 44 adjacent the end thereof on the opposite side of the shaft 40 from that portion of the lever which carries the pin 45. The platform 14 is provided with an aperture 50 through which the end portion of the pin 45 is adapted to extend, the point 47 of said pin being adapted to normally contact the upper edge of the blade 6. As will be hereinafter more fully described, the pin 45 functions as a feeler discharge control.

The lever 42 is provided adjacent its free end with an elongated slot 51. A pin 52 having a tapered end portion 53 is adapted to be positioned in said slot and may be adjustably disposed therein by means of the screw member 54 which functions to confine the lever 51 by the washers 55 and 56 carried upon pin 52. Pin 52 is so disposed as to have the tapered end 53 thereof extend through the aperture 50 in the platform 14. A set screw 57 is carried by the lever 42 intermediate its length, the end of said set screw being adapted to bear upon the upper surface of the lever 44. A pin 58 is transversely disposed between plates 22 and 23 and a coil spring 59 embraces said pin, one end of said spring being adapted to bear upon the upper portion of lever 42 and the other end thereof being anchored upon the plate 23. The function of spring 59 is to urge lever 42 toward lever 44 thereby causing the end of set screw 57 to resiliently bear upon the upper surface of the lever 44.

In operation, a plurality of hairpins 7 are continuously deposited upon the upper edge of the blade 6 by means such as described in the Goldberg patent hereinbefore identified. The hairpins slide downwardly upon the blade 6 with their U-bends confined in the spaces 19 and 15 until the first pin of the group of hairpins contacts the point 47 of pin 45 which normally contacts the upper edge of blade 6, as shown best in Figs. 2 and 4. When the arm 28 is swung by the operator in a clockwise direction, Figs. 4 and 5, the control element 20 is rocked in a counterclockwise direction about pivot 21 by the action of cam 30. The free end of the control element is thus lifted thereby lifting the pin 45 upwardly from the blade 6 and the hairpins are permitted to slide downwardly upon blade 6 until the first hairpin of the group contacts pin 52, which is normally in contact with the upper edge of blade 6.

It will be noted that under normal conditions, that is, when none of the hairpins has become jammed upon blade 6, a predetermined number of hairpins 7 will be confined in the space 15 between pin 52 and the point 47 of pin 45. This zone is herein referred to as the counting zone. Of course, a greater or lesser number of hairpins

may be confined in the counting zone by adjusting the position of pin **52** in slot **51**, as hereinbefore described. With a free flow of hairpins along the blade **6**, hairpins will be disposed between pin **45** and the upper edge of blade **6** when the free end of the control element is in upraised position.

When the arm **28** is released by the operator, the control element tends to return to normal position. However, the point **47** of pin **45** which normally rests upon blade **6** will be prevented from doing so because of the presence of hairpins beneath the flat portion **46** of said pin, the length of point **47** being less than the thickness of the hairpin at its U-bent portion. Pin **45** and hence the end of lever **44** which carries said pin is raised. This, in turn, tends to raise set screw **57**, rocking lever **42** about its pivot against the tension of spring **59**. The free end of lever **42**, and hence pin **52** is raised above its normal position a distance greater than the said thickness of the hairpin by reason of the greater effective length of lever **42** than that of lever **44** from their adjacent points of pivot at **39** and **40** respectively, thereby permitting those hairpins confined in the counting zone to slide off the end of blade **6** and be caught by the arm **5**. In this manner a predetermined number of hairpins may be periodically discharged and made available to the operator.

If, however, the hairpins are obstructed in their travel along blade **6** and a number of hairpins are discharged to the counting zone insufficient to completely fill said zone and leave no hairpin beneath the pin **45**, point **47** comes to rest on the edge of blade **6**, and tapered end **53** of stop **52** remains lowered sufficient to impede passage of hairpins, with the result that the group of hairpins in the counting zone cannot be discharged to arm **5** by the manipulation of arm **28**.

Referring particularly to Figs. 8 and 9, the operation of my device will be apparent under the circumstances hereinbefore noted. With a group **60** of hairpins **7** in the counting zone and no hairpins having followed the hairpins constituting the group **60**, rocking of the arm **28**, as hereinbefore described will raise the free end of control element thus raising pin **45**. When, however, the arm **28** is released and the control element **20** returns to its normal position, the pin **45** and hence the lever **44** will return to normal position. There being no raising force exerted upon lever **42**, pin **52** will not be raised from its normal position and the group **60** will not be discharged.

Due to the resilience of spring **31** and arm **28**, said arm may be moved to the position shown in dotted lines in Fig. 5 to permit the complete removal of the discharged hairpins upon the arm **5** by the operator.

Although my invention has been specifically described in conjunction with the handling of hairpins, it is to be understood that it is equally applicable to the handling of like articles such as paper clips, safety pins and the like.

I claim as my invention:

1. In a device for handling hairpins or like articles the combination with means for feeding forwardly a plurality of such articles, a movable control element disposed adjacent the path of travel of said articles, a feeler carried by said control element normally disposed in the path of travel of said articles to function as a stop against which said articles strike, means for moving said control element to render said feeler inoperative as a stop, a second stop carried by said control element and normally disposed in the path of travel of said articles, said second stop being spaced from said feeler to confine a predetermined number of articles between said feeler and said second stop, means for returning said control element to normal position whereby said feeler contacts one of said articles adjacent the group of articles confined between said feeler and stop to prevent return of said feeler to normal position, means connecting said feeler and stop whereby failure of the feeler to return to normal position holds said stop out of its normal position to permit discharge of said predetermined number of articles past said stop.

2. In a device for handling hairpins or like articles the combination with means for feeding forwardly a plurality of such articles, a movable control element disposed adjacent the path of travel of said articles, a feeler carried by said control element normally disposed in the path of travel of said articles to function as a stop against which said articles strike, means for moving said control element to render said feeler inoperative as a stop and permit articles to pass said feeler, a second stop carired by said control element and normally disposed in the path of travel of said articles to prevent further passage of said articles past said feeler, means for returning said control element to normal position whereby said feeler contacts one of said articles to hold the same, the contacted article holding the feeler out of its normal position, means connecting said feeler and stop whereby failure of the feeler to return to normal position holds said stop out of its normal position to permit discharge of said articles previously held by said stop.

3. In a device for handling hairpins or like articles the combination with means for feeding forwardly a plurality of such articles, a pair of levers, one of said levers being influenced by movement of the other lever, a feeler carried by said last mentioned lever, a stop carried by said other lever against which the articles strike, and means for changing the position of the feeler-carrying lever by the presence of one of said articles in contact with the feeler carried thereby to render the stop carried by the other lever inoperative.

4. In a device for handling hairpins or like articles the combination with means for feeding forwardly a plurality of such articles, a pair of levers, means carried upon one of said levers normally contacting the other of said levers whereby movement of said latter moves the former, a stop carried upon the last mentioned lever against which the forwardly moved articles strike, a feeler carried upon the other lever normally positioned in the path of travel of said forwardly moved articles and spaced from said stop, means for moving both of said levers to raise said feeler from its normal position to permit articles to pass therebeneath, and means for returning said levers to an altered position whereby said feeler rests upon one of said articles to prevent the return of the stop to its article stopping position.

5. In a device for handling hairpins or like articles which comprises, a guide along which said articles move forwardly, a pair of levers positioned above said guide, one of said levers carrying a feeler and the other carrying a stop, said feeler and stop being spaced from each other along the guide, said feeler and stop being nor-

mally positioned in the path of travel of said articles, said stop-carrying lever being in contact with said feeler-carrying lever whereby movement of the latter toward the former causes movement of the former, means for raising said feeler-carrying lever to permit passage of said articles into contact with said stop, means for lowering said feeler-carrying lever, said stop-carrying lever being raised to permit passage thereby of articles when said feeler contacts articles upon said guide when it is lowered and said stop-carrying lever being maintained with the stop in normal position when the feeler is unobstructed by any of said articles when it is lowered.

6. In a device for handling hairpins or like articles which comprises, a guide along which said articles move forwardly, a stop against which said articles strike, a feeler normally in contact with said guide and spaced from said stop along said guide, means for raising said feeler to permit articles to pass therebeneath along said guide, means for lowering said feeler, and means associating said feeler and stop to raise said stop to permit the passage of articles therebeneath when the feeler upon being lowered is prevented by one of said articles from contacting said guide.

7. In a device for handling hairpins or like articles which comprises, a guide along which said articles move forwardly, a lever positioned above said guide, a stop carried by said lever against which said articles strike, a second lever positioned above said guide, a feeler carried by said second lever normally in contact with said guide and spaced along said guide from said stop, means for raising said feeler-carrying lever to permit articles to pass beneath said feeler along said guide, means for lowering said feeler-carrying lever, said feeler-carrying lever contacting said stop-carrying lever whereby said stop-carrying lever is raised thereby raising said stop to permit passage of articles therebeneath when the feeler upon being lowered is prevented by one of said articles from contacting said guide.

8. In a device for handling hairpins or like articles which comprises, a guide along which said articles move forwardly, a lever positioned above said guide and fulcrumed adjacent one end thereof, a stop carried by said lever adjacent its opposite end against which said articles strike, a second lever positioned above said guide, said lever being fulcrumed intermediate its length, a feeler carried by said second lever normally in contact with said guide and spaced along said guide from said stop, means for raising said feeler-carrying lever to permit articles to pass beneath said feeler along said guide, means for lowering said feeler-carrying lever, said feeler carrying lever contacting said stop-carrying lever intermediate the length of the stop-carrying lever whereby said stop-carrying lever is raised thereby raising said stop to permit passage of articles therebeneath when the feeler upon being lowered is prevented by one of said articles from contacting said guide.

RAYMOND J. BOEDIGHEIMER.