

Feb. 14, 1933.

D. G. WERNER

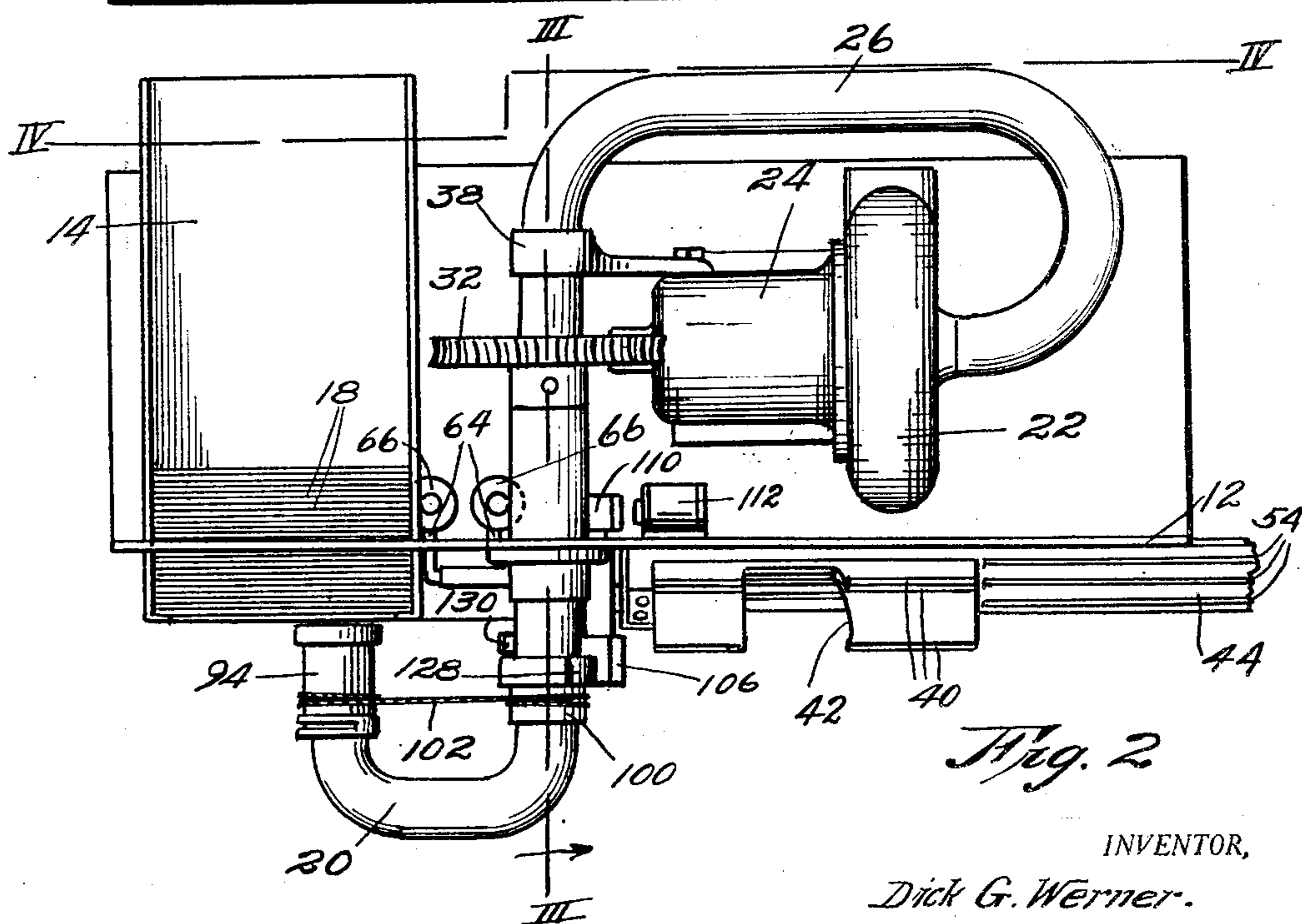
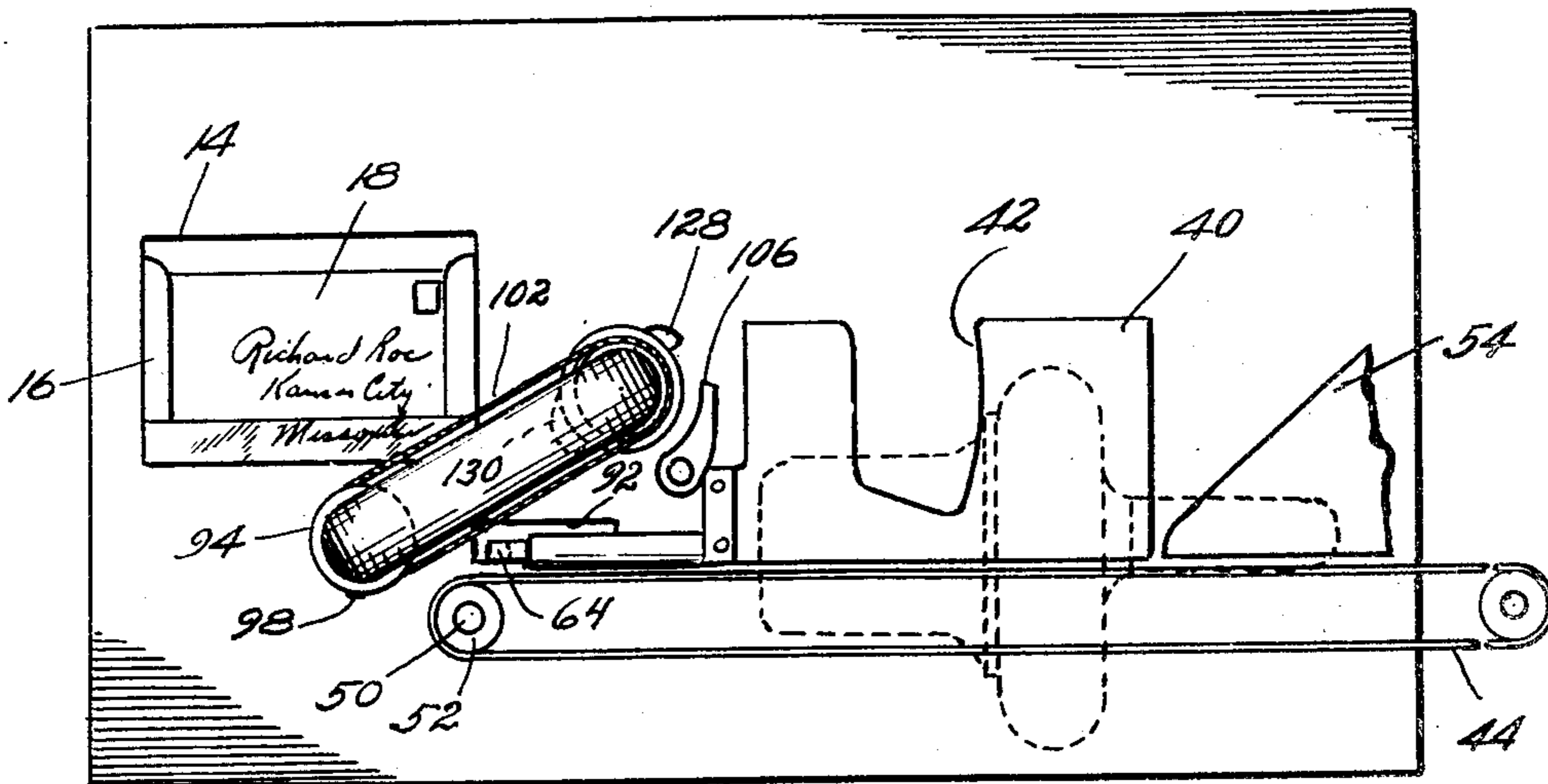
1,897,093

MAIL SEPARATING AND FACING APPARATUS

Filed May 31, 1930

3 Sheets-Sheet 1

Fig. 1



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Fig. 3

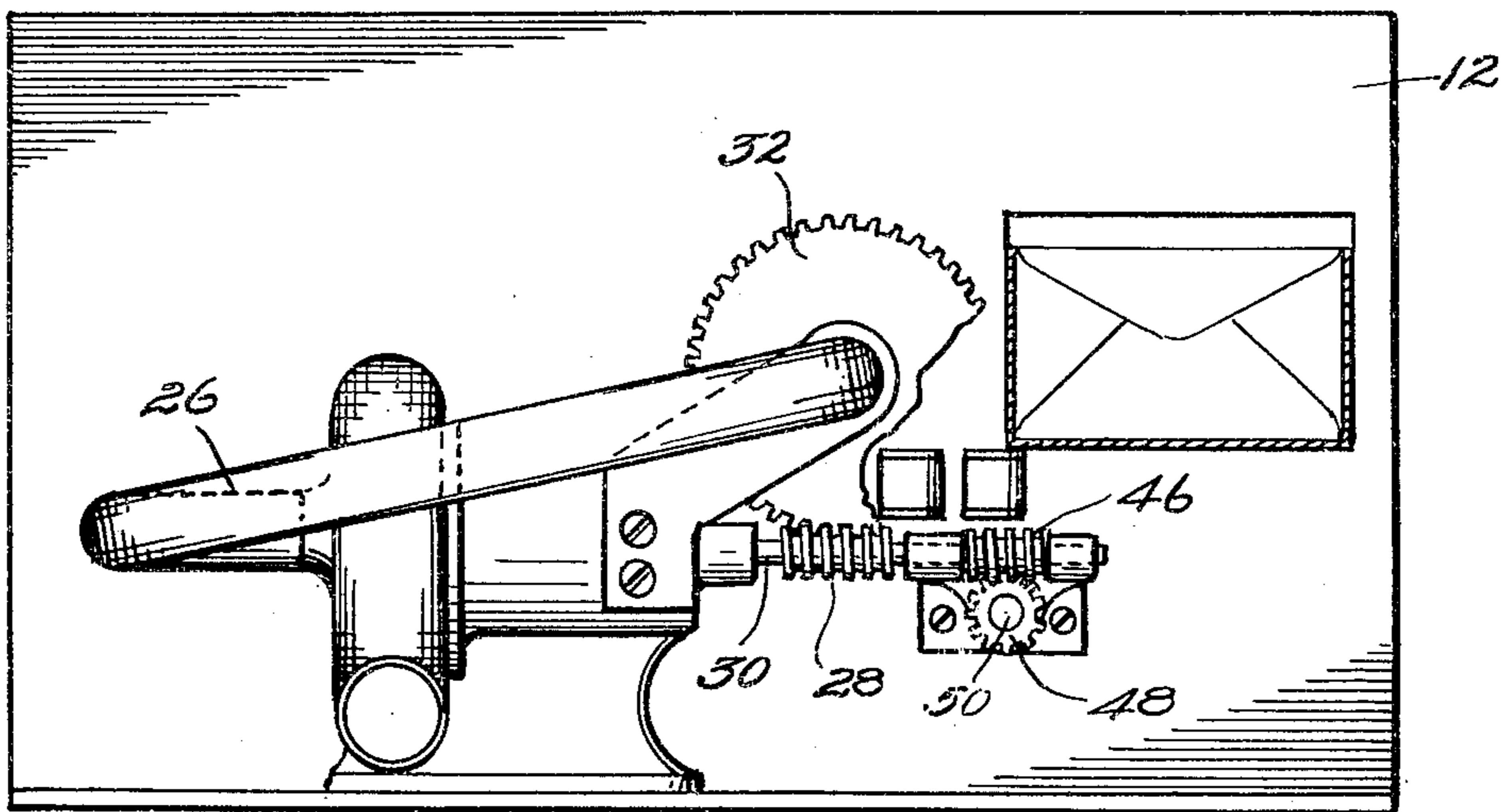
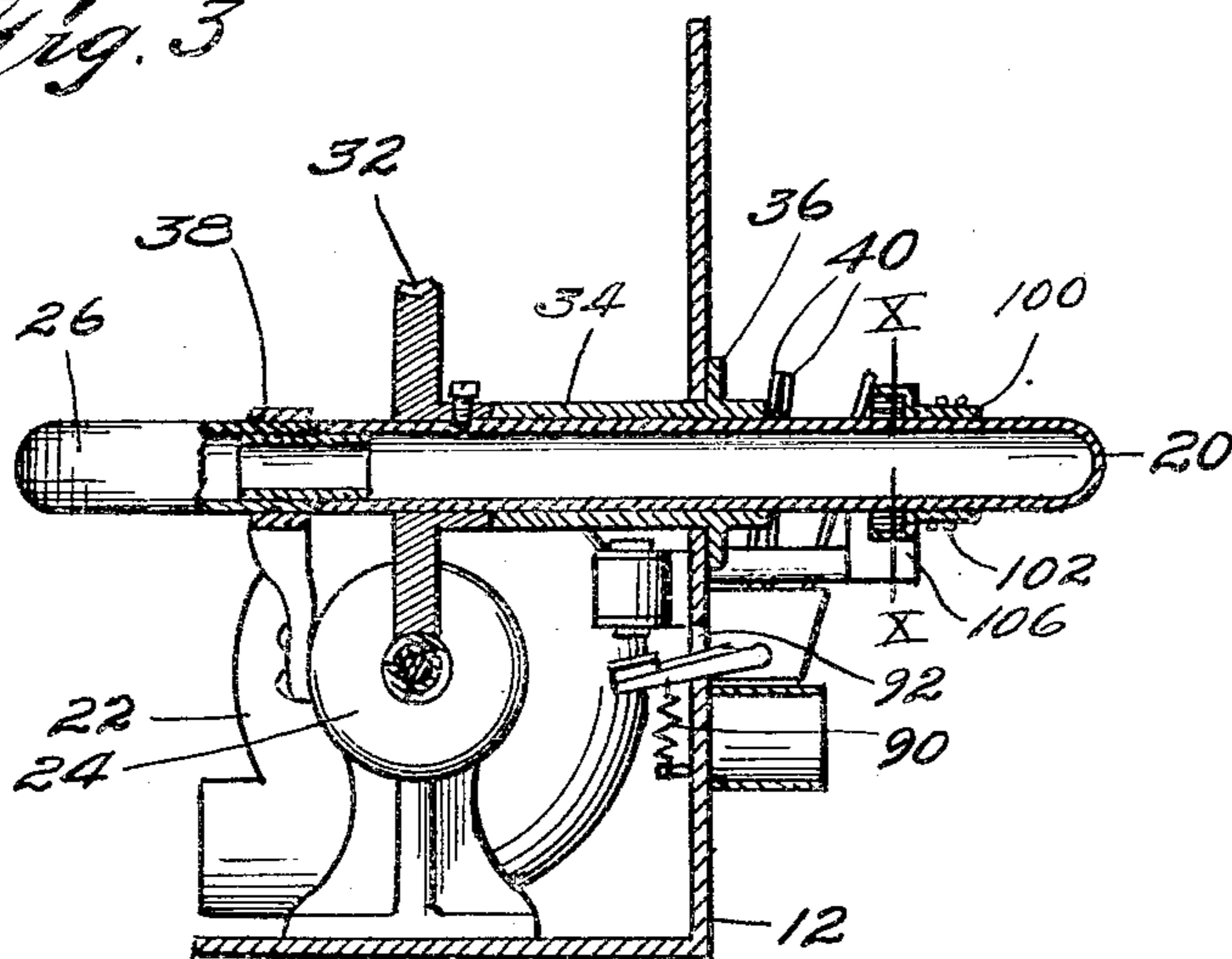
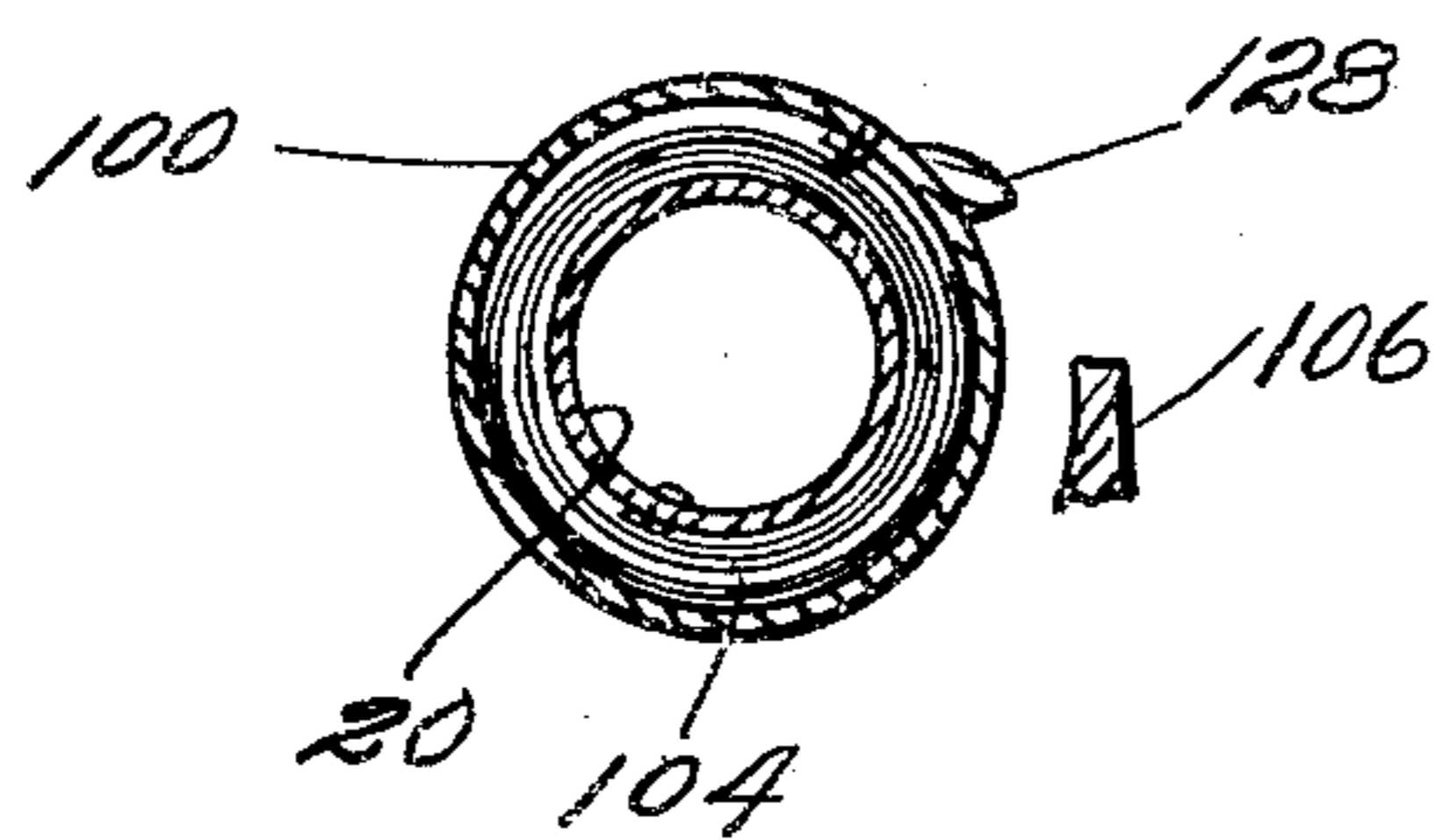


Fig. 4

Fig. 10



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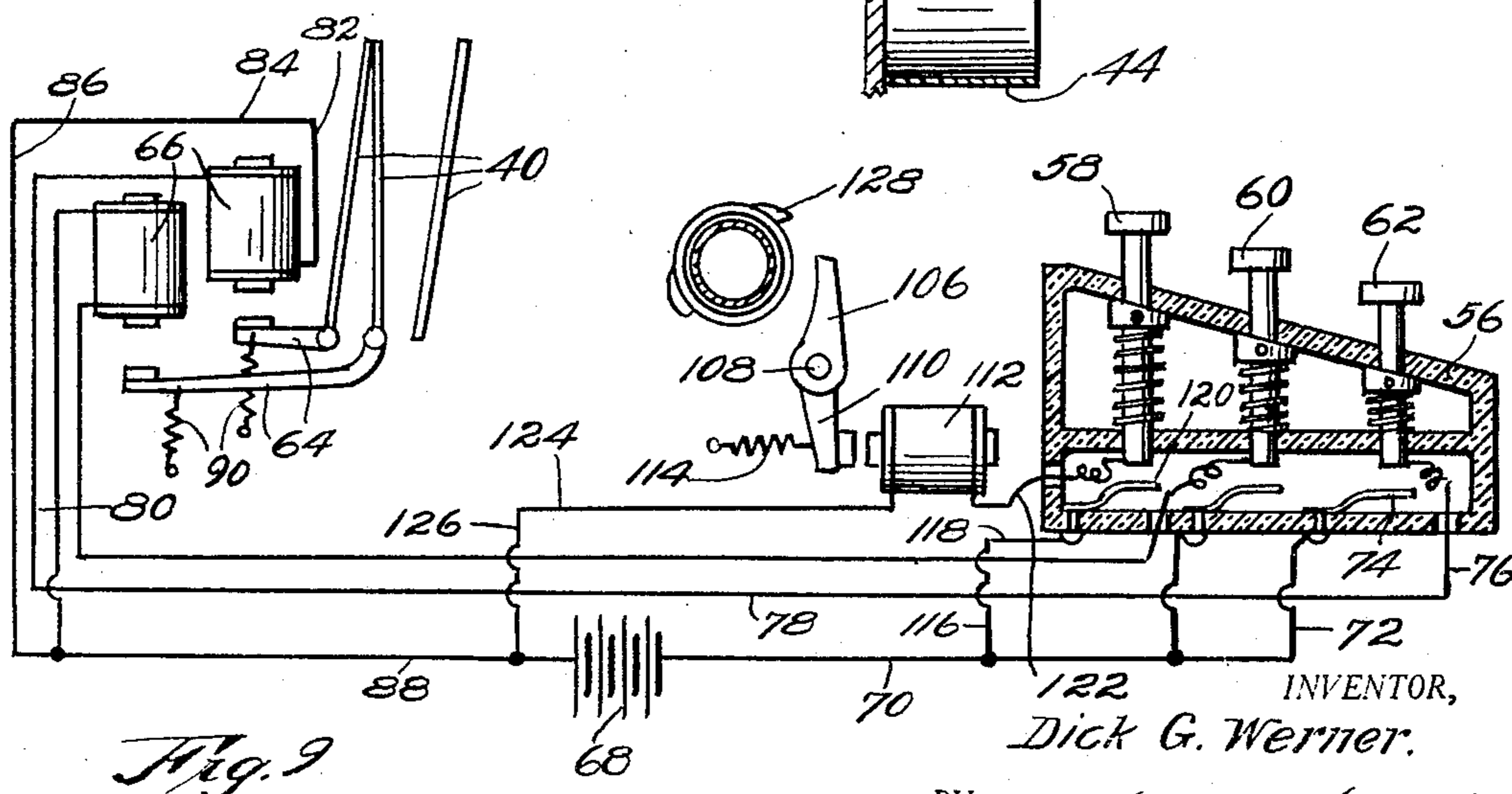
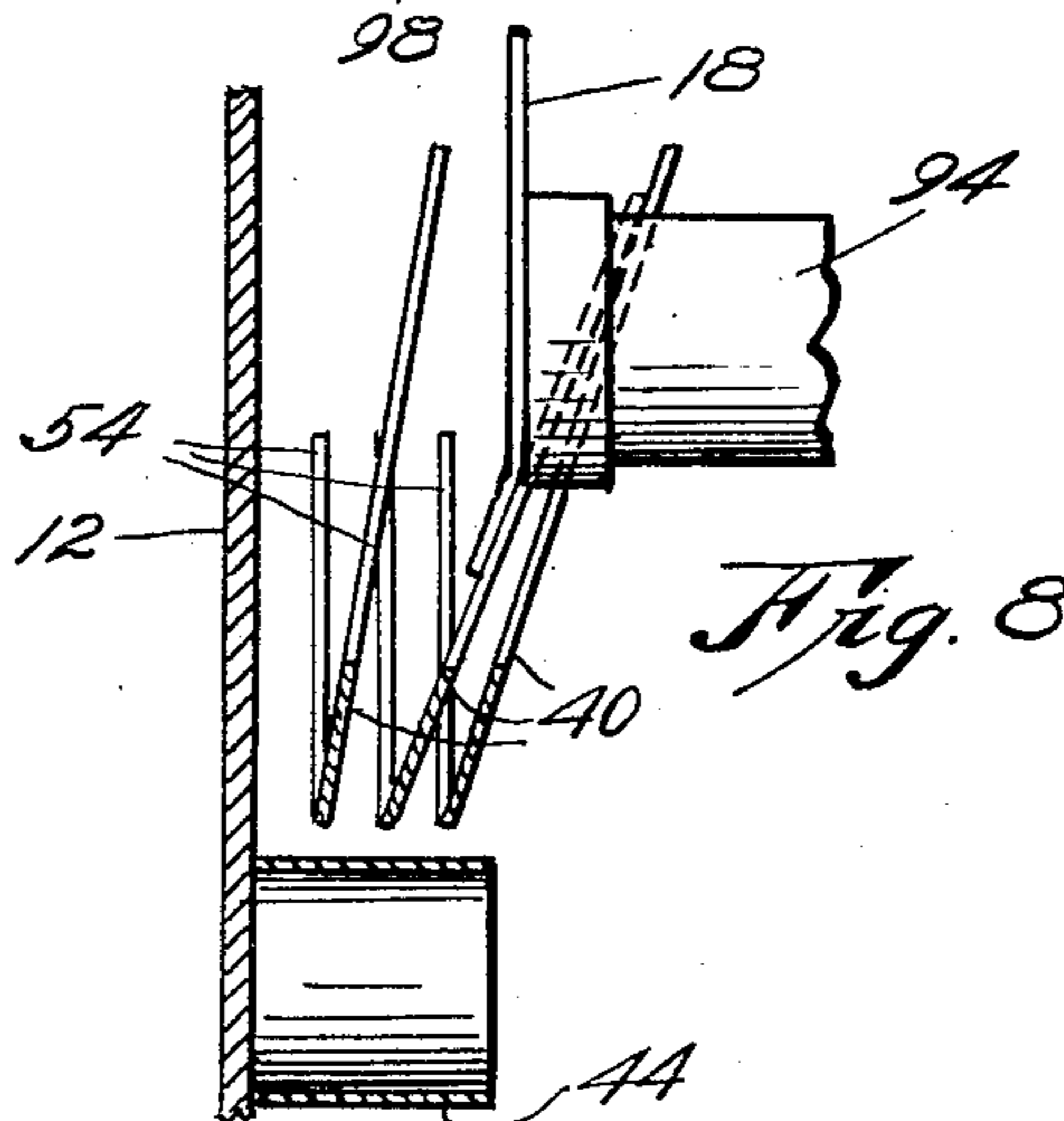
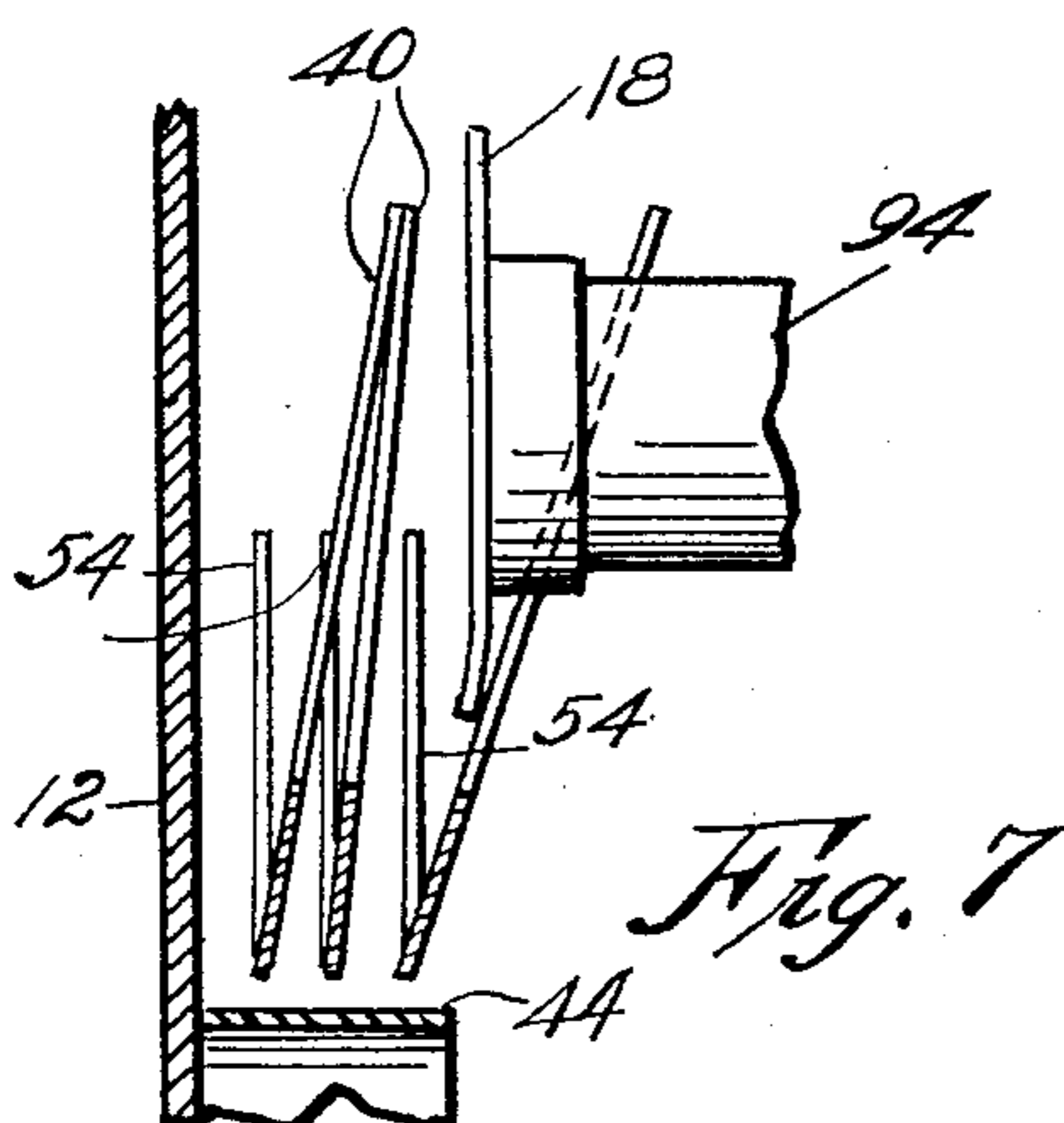
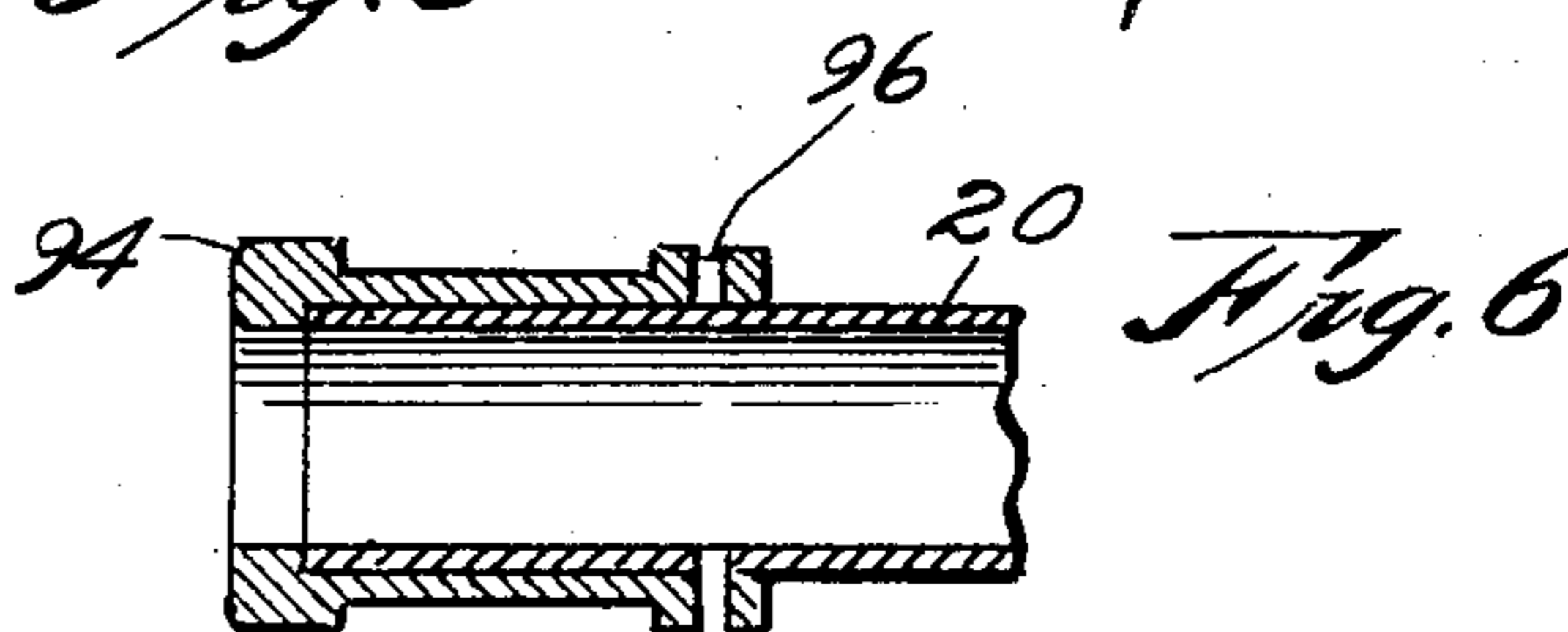
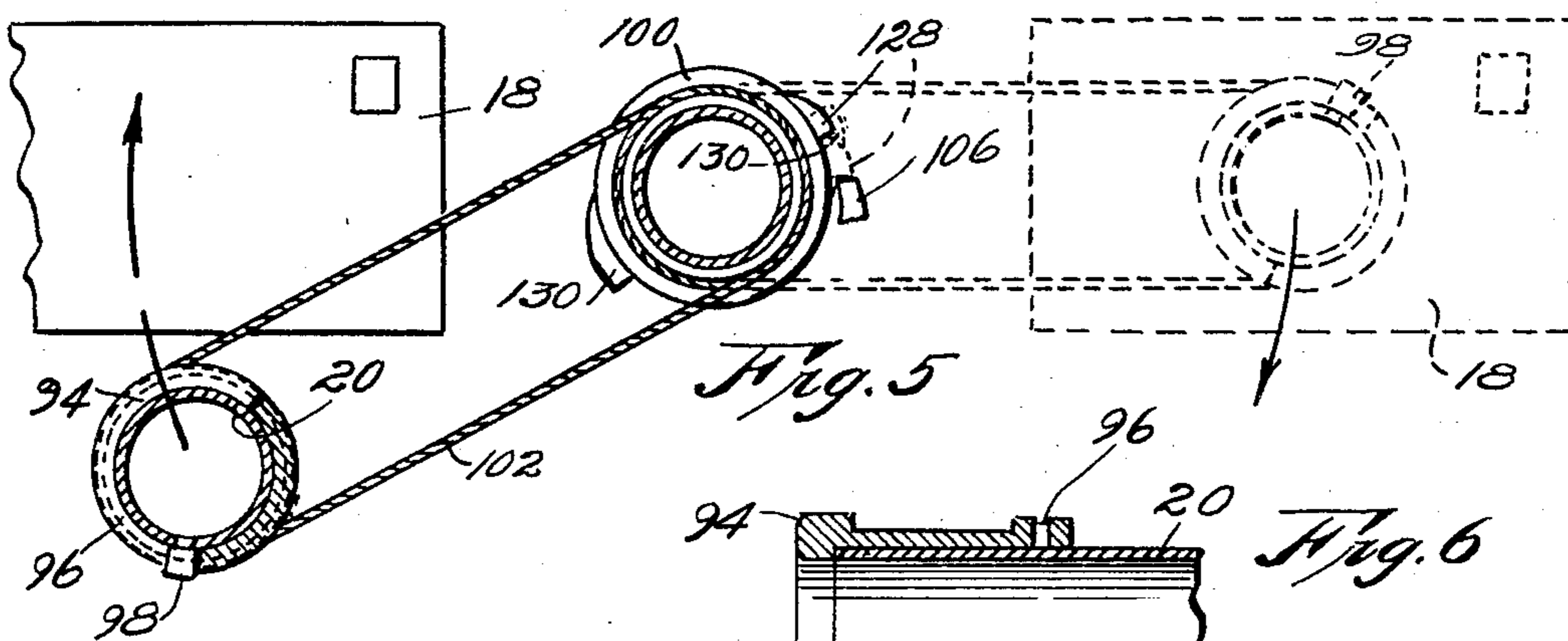
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MAIL SEPARATING AND FACING APPARATUS

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MAIL SEPARATING AND FACING APPARATUS

Application filed May 31, 1930. Serial No. 458,248.

This invention relates to mail handling mechanism and has for its primary object the provision of a machine constructed to handle mail which is preferably in the form of letters, and the machine is particularly adapted for facing and sorting the letters in a manner which eliminates time and human labor.

One of the primary objects of the invention is to provide a mail facing and sorting machine having means for acting upon a piece of mail whereby the same is selectively turned or transferred from one part of the machine to another as the lower edge of the letter is maintained in substantially parallel relation to the line of the edge of the letter at its point of beginning.

A further object of the invention is the provision of an extremely simple and durable apparatus for carrying out the objects of the invention which may include a rotating nozzle having a head carried thereby which may be maintained in stationary relation with respect to the nozzle, or which may be rotated with respect thereto when the action desired upon the letter has been determined.

Another object of the invention is the contemplation of a novel electrically operated distributing device which forms a part of the machine made in accordance with this invention and which is positioned adjacent a conveyor having a plurality of ways into which it is desired to introduce the pieces of mail being distributed.

It is well known in this art that the distribution of first class mail in letter form is difficult in view of the positions assumed by the letters and in view of the fact that manually distributing the mail is slow and the human element renders such distribution inaccurate. It is therefore an object of this invention to provide a mail facing and sorting machine which may be entirely electrically operated and which will perform practi-

cally all of the duties required by a perfect distributor.

Novel points of structure will be set forth and described during the course of the detailed specification referring to the accompanying drawings wherein but the preferred embodiment of the machine made in accordance with this invention has been illustrated.

In the drawings wherein similar reference characters designate like parts throughout the several views:

Figure 1 is a front plan view of a mail facing and sorting machine made in accordance with this invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a vertical cross section through the machine taken on line III—III of Fig. 2, looking in the direction of the arrow.

Fig. 4 is another vertical cross section taken on line IV—IV of Fig. 2.

Fig. 5 is an enlarged diagrammatical view of the pick-up head and nozzle showing the same in two positions with respect to the point of pick-up.

Fig. 6 is an enlarged fragmentary longitudinal section through the pick up head.

Fig. 7 is an enlarged fragmentary vertical sectional view through the distributor and a portion of the transferring member showing the letter being dropped into position for entrance into one of the ways of the conveyor.

Fig. 8 is a similar view showing the letter being dropped into another way of the conveyor.

Fig. 9 is a diagrammatical view of the electrical circuit which may be used in connection with this machine, and,

Fig. 10 is an enlarged cross sectional view taken on line X—X of Fig. 2.

With particular reference at this time to the drawings, which show in detail one form of the invention, the numeral 12 is any suitable support for the parts of the machine with which is associated a feed trough 14

having one of its ends provided with in-turned flanges 16 which serve as stops for the letters 18 which are placed into the trough when it is desired to pass the same to the various ways over the later described conveyor belt.

Very often the letter is presented against flanges 16 of trough 14 with the stamp in the lower left hand corner instead of in the position shown in Fig. 1. If this be the case, it is preferred to face the letter 18 in an upright position before it is sent along the conveyor to the cancelling machine. In other instances it is not necessary to turn the letter 18 and it must be carried over from the trough 14 to the distributor and lodged thereon with the bottom edge thereof in substantially the same horizontal position as it was at the point of beginning. Accordingly, the transferring member made in accordance with this invention has structure associated therewith which acts upon the letter 18 in the manner desired.

The transferring member 20 is a substantially arcuate nozzle made of tubular material and connected to a suction fan 22 which is actuated by a motor 24. The connection to the fan 22 should be in the form of a conduit 26 through which is drawn the air to create a suction at the pick-up end of nozzle 20 sufficient to support a letter 18. To rotate nozzle 20 this same motor 24 is provided with a worm gear 28 upon its shaft 30 which is in mesh with a spur gear 32, rigidly affixed to the rotatable section 34 of conduit 26 passing through a bearing 36 supported by the member 12. An additional bearing 38 maintains the section 34 in proper alinement at the end where it joins conduit 26. A sleeve projecting into conduit 26 and into section 34 thereof permits rotation without leakage and so long as the motor 24 is running air will be drawn through the conduit and the movable section 34 thereof and the nozzle 20 will be caused to rotate.

The pick-up end of nozzle 20 rotates in a vertical plane which lies close enough to the face of letter 18, which has been moved against flanges 16 of trough 14, to create a suction thereon of sufficient strength to hold the letter 18 and draw it with nozzle 20 as it moves from in front of trough 14 to the distributor.

The novelly constructed distributor which acts upon the letter 18 to wipe it from its engagement with the nozzle 20 may include a plurality of plates 40, each of which is provided with an arcuate slot 42 for the reception of the free end of nozzle 20 as it is rotated. These plates 40 are spaced apart at the bottom thereof and are pivotally mounted along their lower edge to allow them to be individually and selectively moved to an angle which permits positioning the letter 18 between a predetermined set of plates 40.

As shown in the drawings, these plates 40 overlie a conveyor belt 44 which may be moved through the intermediacy of worm gear and pinion 46 and 48 respectively, driven by the motor 24 as clearly illustrated in Fig. 4. Obviously, pinion 48 is rigidly secured to shaft 50 which carries roller 52 around which may pass the belt 44.

There may be any number of plates 40 and to efficiently carry out the invention, a like number of plates 54 extending longitudinally of belt 44 may be provided above said belt to divide the same into a plurality of ways, each of which may lead to predetermined locations where letters addressed to like locations may be assembled. Manifestly, a letter 18 may be directed into the proper way above belt 44 by manipulation of the plates 40. A key board 56 having manually operable keys 58, 60 and 62 is provided at a convenient location for the operator to actuate the parts of this machine which are movable through the employment of electromagnets. In the case of the movement of plates 40, two of the same have been illustrated in a diagrammatical manner in Fig. 9, and while any number of plates 40 may be used, two is sufficient to illustrate the point of invention.

Each of plates 40 which is pivotally mounted along its lower edge has an arm 64 extending to a point adjacent solenoids 66, one of which is provided for each arm 64. When the solenoids 66 are energized by depressing key 60 or 62 as the case may be, the appropriate coacting arm 64 is pulled thereagainst and the plate 40 acted upon by the arm is moved to a forwardly angled position such as that shown by the central plate 40 in Fig. 8. Key board 56 should be constructed of insulating material and in following out the circuit closed by key 62, it will be seen that energy passing from the source of supply 68 will pass along wire 70 to wire 72 and to contact point 74 which, when key 62 is depressed, will engage the lower end thereof and cause electrical energy to pass into wire 76 conductively carried by the stem of key 62. From this point the current passes into wire 78, to wire 80 and thence into the right hand solenoid 66 to energize the same. To complete the circuit wires 82 and 84 carry the current to wire 86 and then to a conductor 88 from whence it returns to the source of supply 68. Each of movable plates 40 is actuated through the use of a similar circuit, and after the solenoid has released its hold upon the plate to maintain it in the angled position, a spring 90 may be utilized to return the same to the point of beginning. The opening 92 through support 12 may be employed as a limiting stop in both directions for the movement of plates 40. When nozzle 20 reaches plate 40 the letter 18 carried thereby will extend on either side of slot 42 to be engaged by the inner face of plate

40 and as the nozzle 20 continues to move, letter 18 will be pulled therefrom and will drop to a position upon conveyor 44.

To carry out the features set forth above and with particular reference to the structure associated with the nozzle 20 by means of which the letter 18 is transferred to the distributor in either one or two positions, reference will now be had to the details of said structure which may include a head 94 which is mounted for limited rotary movement upon the free end of nozzle 20. This head 94 directly engages the letter 18 and movement longitudinally thereof is precluded by the employment of a slot 96 formed through head 94 adjacent one end thereof and extending but part way therearound. A pin 98 projecting into slot 96 from nozzle 20 precludes longitudinal movement, yet permits head 94 to rotate as pin 98 passes through slot 96. A collar 100 mounted for rotation upon nozzle 20 is connected with head 94 by an endless belt 102 to set up relative rotation at a predetermined time hereinafter set forth. Belt 102 in the instance shown is wound about head 94 and collar 100 so that friction maintains the same in position thereon. If desired, the belt 102 may be otherwise secured or fastened to the two members without altering the operation.

As shown in Fig. 10, a resilient member such as the spring 104 exerts a pressure upon collar 100 which is transmitted through belt 102 to head 94 in a manner which maintains one end of the slot 96 against pin 98 carried by nozzle 20. One end of spring 104 is secured to nozzle 20 while the other end thereof is attached to collar 100. When the parts are in the relation shown in the drawings, especially Fig. 1, and collar 100 is being rotated by nozzle 20, head 94 will not be rotated with respect to nozzle 20 as it is moved from the point of pick-up to the point of release. Letter 18 is reversed by the rotation of nozzle 20 only, and by holding head 94 against relative movement, the stamp, which is positioned in the lower left hand corner at the point of beginning, will be in the upper right hand corner at the time of release. The action of the machine just set forth in the one normally taken thereby without manipulation of the key board, insofar as key 58 is concerned.

When a letter 18 is presented against flanges 16 of trough 14 with its stamp in the upper right hand corner, it is desired not to reverse the same and as soon as this point has been determined key 58 is pressed to actuate a pawl 106 which is pivotally mounted upon shaft 108 extending through support 12 where it carries an arm 110 in operative relation with a solenoid 112. A spring 114 may be utilized to normally maintain pawl 106 out of engagement with the solenoid 112. When key 58 is depressed, elec-

trical energy will pass from a source of supply 68 to wire 70, thence to conductors 116 and 118 to a contact 120 which is engaged by the lower end of key 58 which carries wire 122 connected with solenoid 112. From solenoid 112 the electrical energy may pass back to the source of supply 68 through conductors 124 and 126 as well as line 88. Thus the circuit is closed, the solenoid is energized and pawl 106, stationary with respect to rotating nozzle 20, is brought into engagement with a shoulder 128 formed on the periphery of collar 100. Manifestly, this action stops the rotation of collar 100, and as nozzle 20 rotates, relative rotary movement will be imparted to head 94 through the intermediacy of belt 102. A cam-face 130 formed integrally on the periphery of nozzle 20 adjacent collar 100 and in the path of a portion of pawl 106 is adapted to force pawl 106 out of engagement with shoulder 128 immediately after letter 18 is wiped from head 94 by one of the plates 40. This action takes place even against the force exerted by solenoid 112 and as soon as pawl 106 is carried out of engagement with shoulder 128 spring 104 will carry head 94 back to the point of beginning through its action upon collar 100 and belt 102. Thus when the nozzle 20 again reaches the point of pick-up in front of trough 14 it will be possible to cause the same to carry a letter 18 to the point of release in either one of the two ways hereinbefore described. The engaging faces of shoulder 128 and pawl 106 are constructed to preclude release until the proper time, even though solenoid 112 has been deenergized by the release of key 58.

This mail handling machine receives letters in its trough which are in any one of four positions. The letter may be face or back forward and the stamp may be in the upper right hand corner or the lower left hand corner, or, in the case of the back being toward the front, the stamp will be in either the upper left hand corner or the lower right hand corner, viewing the letter from the pick-up end of the trough. It is plain to be seen that once handled by this machine the letters are in two separate bundle classifications and may be fed directly to the canceling machine without further handling.

What is claimed as new and desired to be secured by Letters Patent is:

1. A mail handling machine comprising a feed trough, a conveyor, a transferring member having a nozzle disposed between said trough and conveyor, and structure associated with the transferring member to act upon a piece of mail including a head mounted upon the nozzle of said member for limited rotation relative thereto.

2. A mail handling machine comprising a feed trough, a conveyor, a transferring nozzle between said trough and conveyor, a head

mounted on said nozzle for limited rotation relative thereto and means including a movement limiting stop to preclude movement of said head in a direction transverse to the
5 plane of rotation.

3. A mail handling machine comprising a feed trough, a conveyor, a rotatable transferring nozzle between said trough and conveyor, a head mounted on said nozzle for
10 limited rotary movement with respect thereto, and means to rotate said head with respect to the nozzle as the nozzle is being rotated.

4. A mail handling machine comprising a
15 feed trough, a conveyor, a rotatable transferring nozzle between said trough and conveyor, a head mounted on said nozzle for rotary movement with respect thereto and means to selectively preclude such rotary
20 movement.

5. A mail handling machine comprising a feed trough, a conveyor, a rotatable transferring nozzle between said trough and conveyor, a head rotatably mounted on said nozzle, means to normally hold said head against
25 relative rotation with the nozzle as the nozzle is rotated and means associated with said holding means to selectively engage the same to cause relative rotation of head and nozzle
30 as the nozzle is rotated.

6. A mail handling machine comprising a feed trough, a conveyor, a rotatable transferring nozzle to carry pieces of mail from said trough to the conveyor, a head rotatably
35 mounted on said nozzle and means to normally hold said head against relative rotation with the nozzle as the nozzle is rotated including a collar carried by the nozzle and a connecting element between said collar and
40 head.

7. A mail handling machine comprising a feed trough, a conveyor, a rotatable transferring nozzle to carry pieces of mail from said trough to the conveyor, a head rotatably
45 mounted on said nozzle and means to normally hold said head against relative rotation with the nozzle as the nozzle is rotated including a collar carried by the nozzle and a connecting element between said collar and
50 head, said collar having a spring therein to yieldably exert a holding pressure upon the head through the connecting element.

8. A mail handling machine comprising a feed trough, a conveyor, a rotatable transferring member to carry pieces of mail from the
55 trough to said conveyor, said transferring member having means including an electromagnetically controlled pawl and rotatable head acted upon by said pawl for causing said
60 piece of mail to be carried to the conveyor with its lower edge in a line parallel to its line of beginning.

9. A mail handling machine comprising a feed trough, a conveyor, a plurality of ways
65 formed above said conveyor, a transferring

member to carry pieces of mail from the trough to said conveyor and a distributor having a plurality of slotted tiltable plates selectively operable to direct the mail into
70 any of said ways, said transferring member passing through said slot as the piece of mail is removed therefrom.

10. A mail handling machine comprising a feed trough, a conveyor, a plurality of ways formed above said conveyor, a transferring
75 member to carry pieces of mail from the trough to said conveyor and a distributor comprising a plurality of plates movable into the path of travel of the piece of mail to remove the same from said transferring
80 member as it moves past the plates.

11. A mail handling machine comprising a feed trough, a conveyor, a plurality of ways formed above said conveyor, a transferring
85 member to carry pieces of mail from the trough to said conveyor and a distributor comprising a plurality of plates each pivotally mounted for selective movement into the path of travel of the piece of mail and transferring
90 member as they move past said plates.

12. A mail handling machine comprising a feed trough, a conveyor, a plurality of ways formed above said conveyor, a movable transferring member to carry pieces of mail from
95 the trough to said conveyor and a distributor comprising a plurality of plates pivotally mounted at their lower edge and means to selectively move said plates about said pivot including an arm, a solenoid and a manually
100 operable keyboard having keys thereon to close a current to energize said solenoid whereby said plates are moved about their pivotal point the path of travel of said transferring member passing through the major
105 plane of said plates when set to receive pieces of mail from the transferring member.

13. A mail handling machine comprising a feed trough, a conveyor, a plurality of ways formed above said conveyor, a transferring
110 member to carry pieces of mail from the trough to said conveyor and a distributor comprising a plurality of plates positioned in the path of travel of said transferring member to wipe said piece of mail from the
115 transferring member as the same moves by past said plates whereby the piece of mail is selectively directed into any one of said ways.

14. In a mail facing and sorting machine, a rotatable transferring nozzle, a conveyor having a plurality of ways formed there-
120 above and a distributor for receiving a piece of mail from said transferring nozzle and selectively directing the same into any one of said ways including a series of plates pivotally mounted and spaced apart at their bot-
125 tom edge to form continuations of said ways and means for pivoting said plates to close the same along the tops thereof to selectively present an entrance into any one of said ways.

15. In a mail facing and sorting machine, a 130

rotatable transferring nozzle, a conveyor, a distributor to receive pieces of mail from the transferring nozzle including a plurality of plates selectively movable to an inclined position with respect to the plane of the path of travel of said nozzle and piece of mail and an opening formed in each of said plates respectively to allow the passage of said nozzle as the piece of mail is engaged by the selected plate.

In testimony whereof, I hereunto affix my signature.

DICK G. WERNER.