

July 6, 1948.

H. L. FITCH

2,444,732

FILM PUNCH

Filed June 15, 1944

2 Sheets-Sheet 1

Fig. 1.

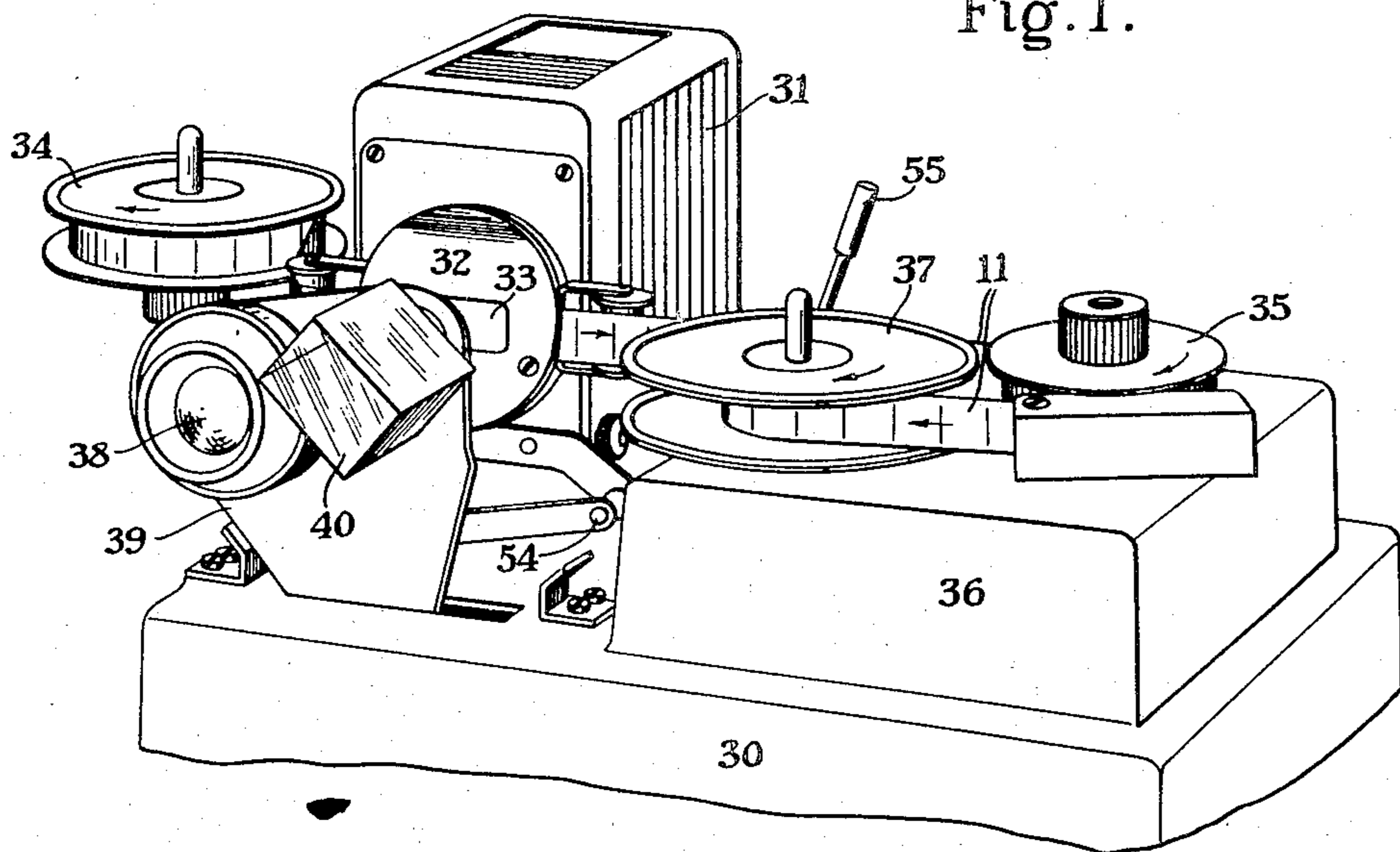
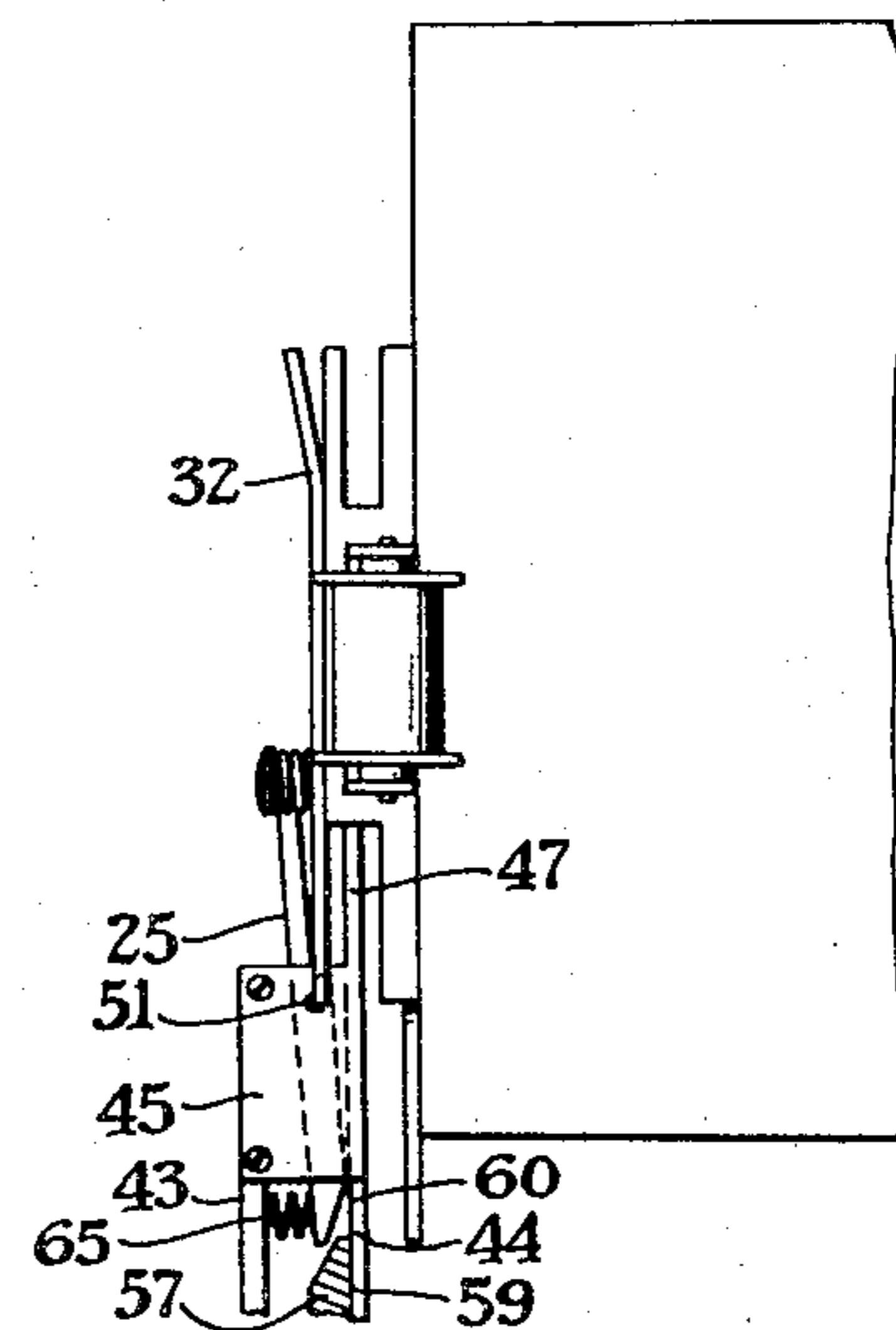
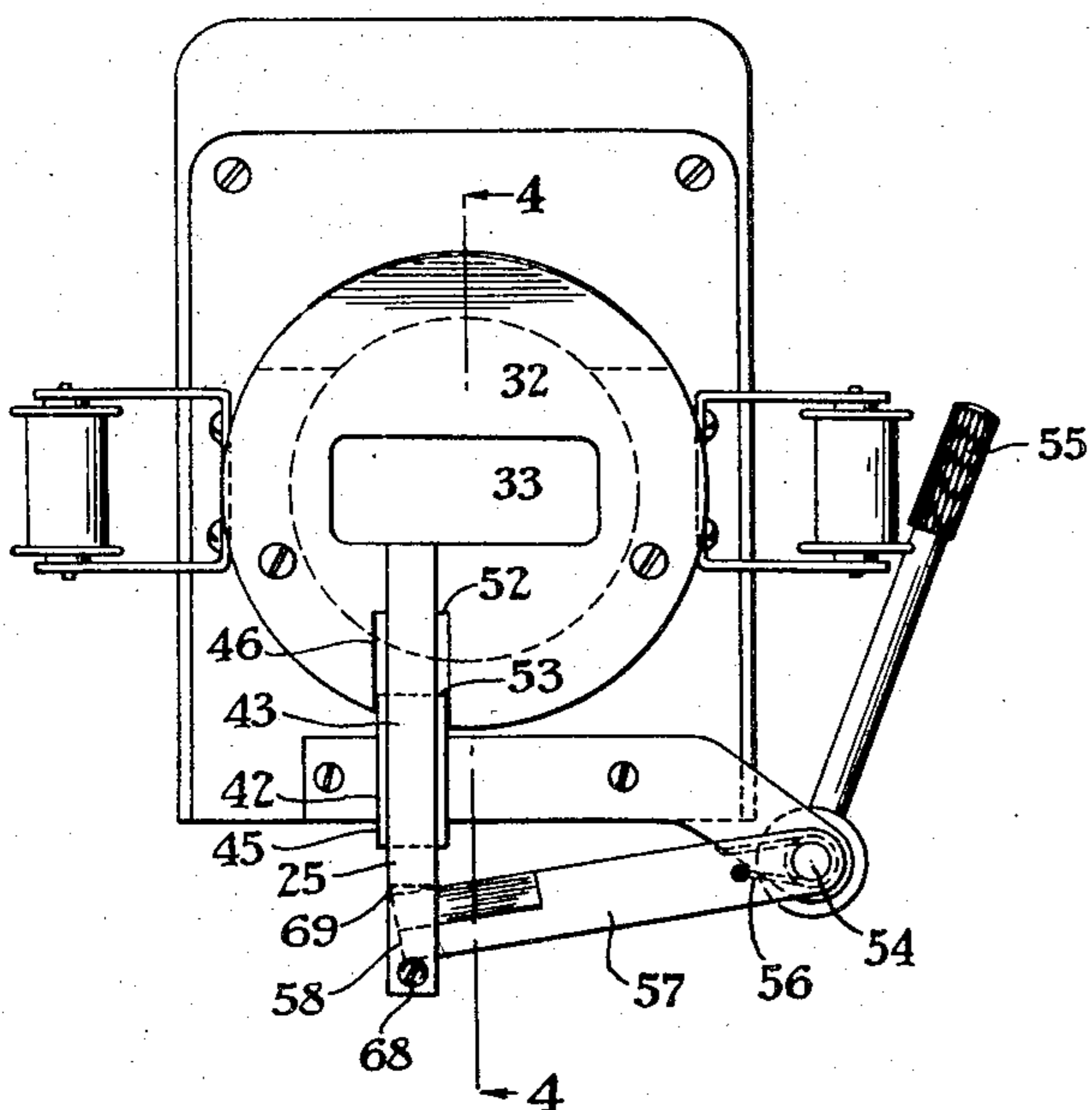


Fig. 2.

Fig. 3.



Harold L. Fitch

INVENTOR

BY

Attorney in Person
J. Chiffon Little
ATTORNEYS

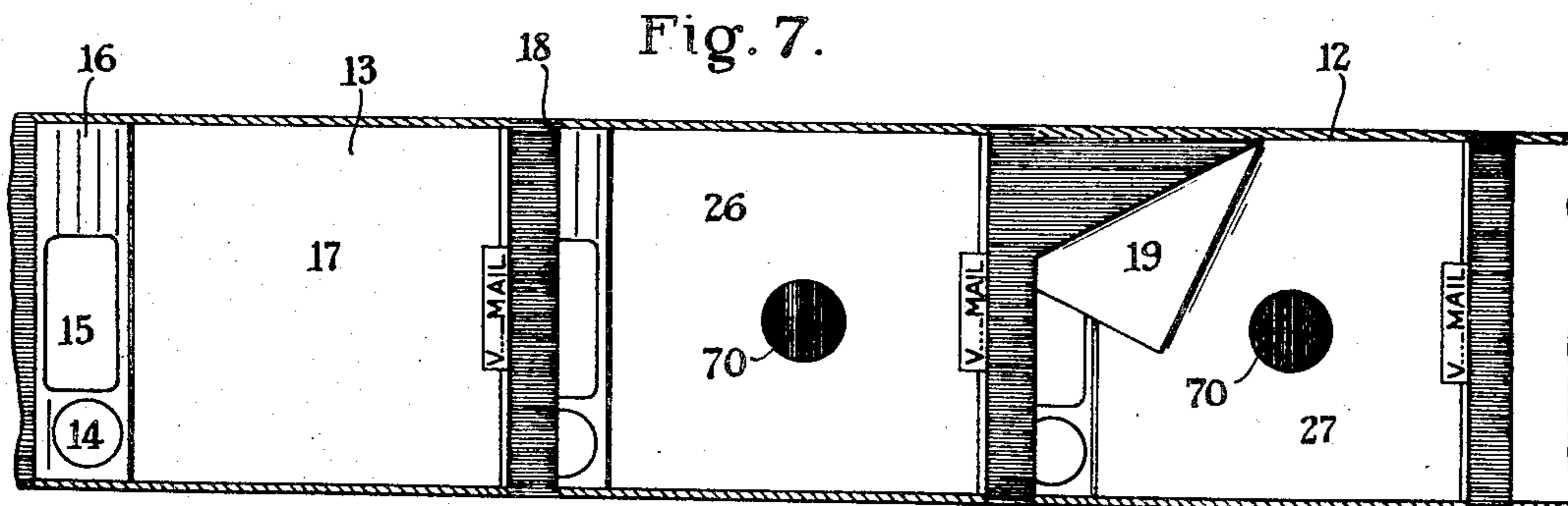
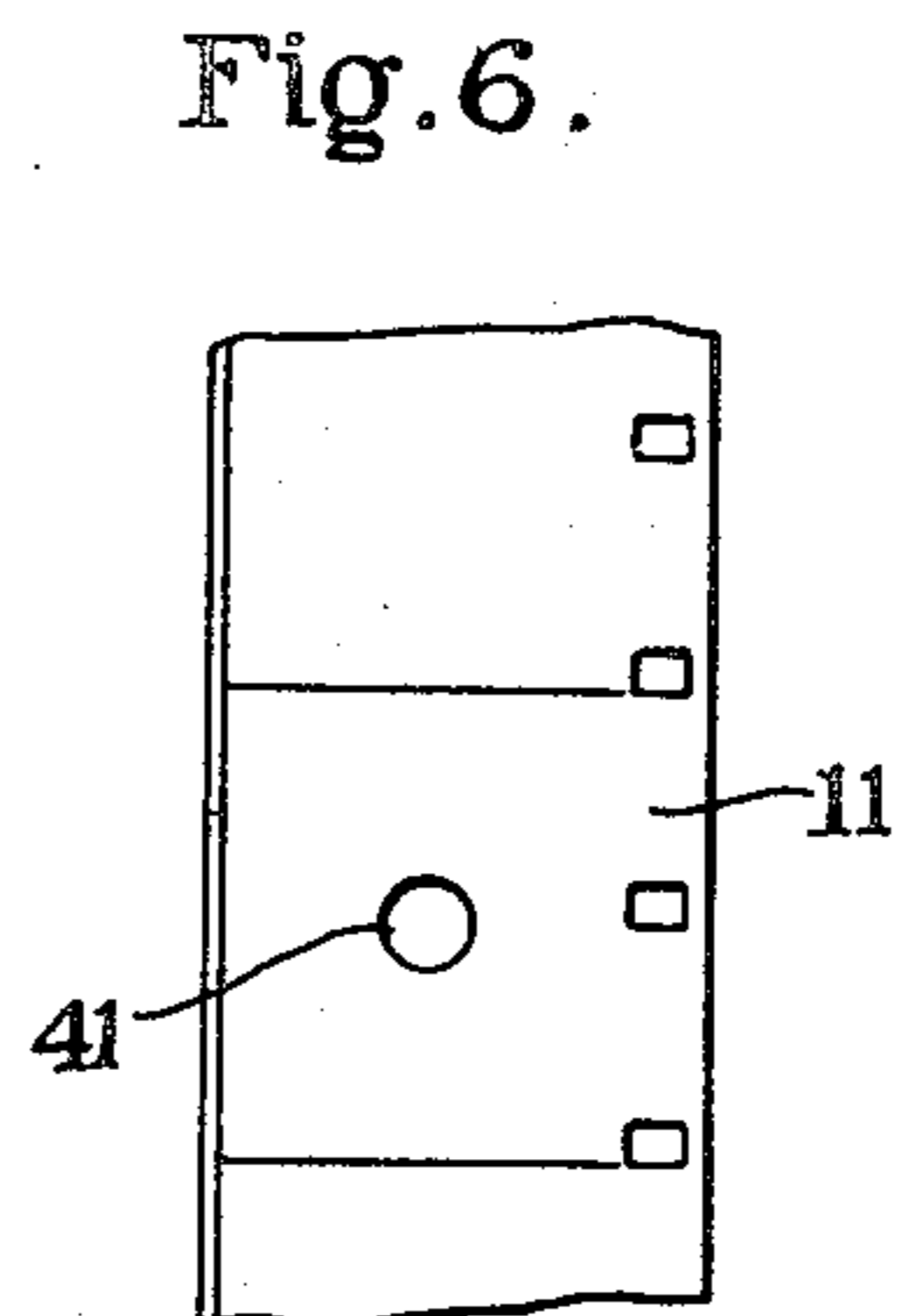
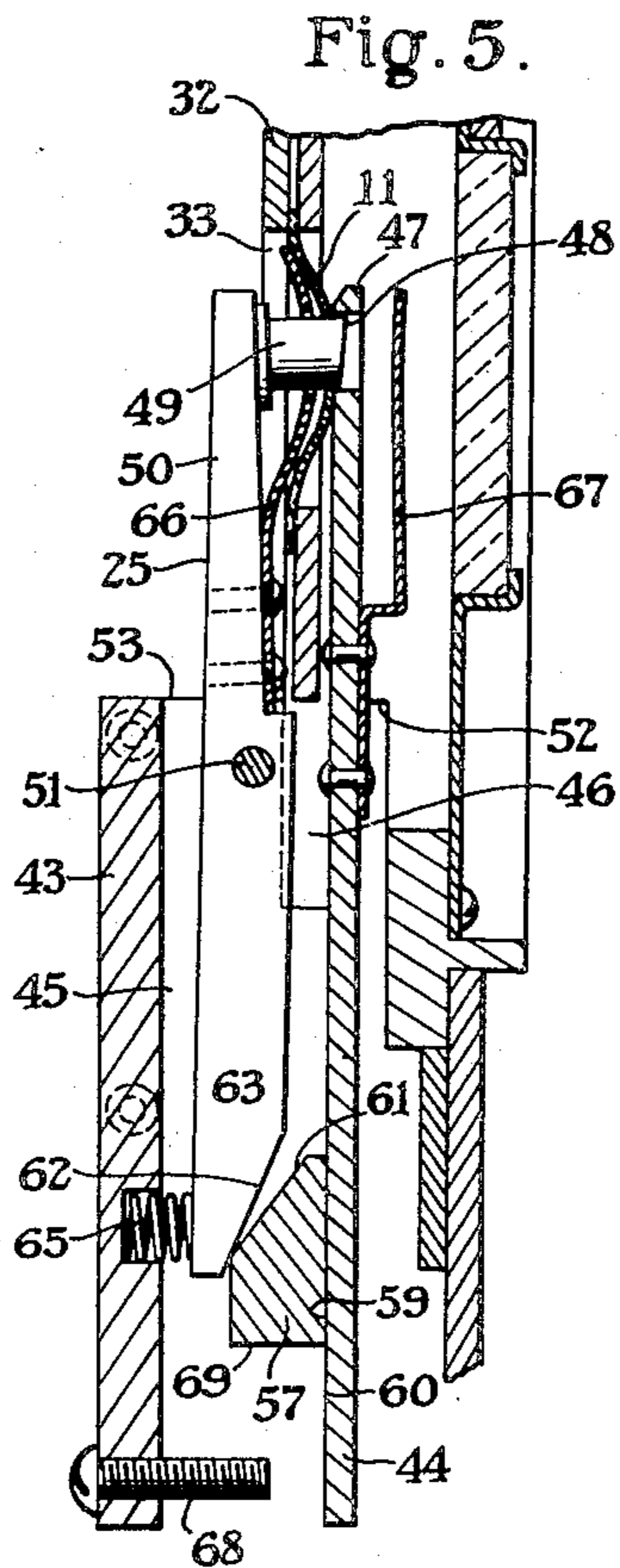
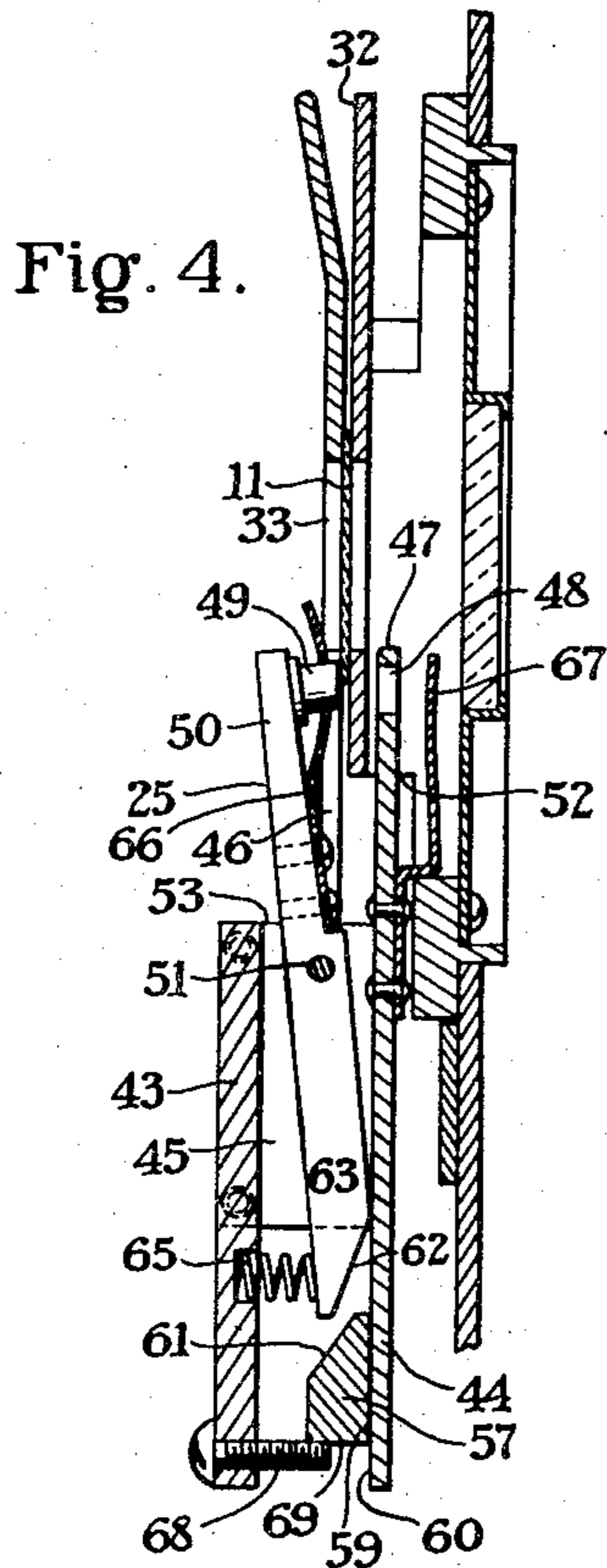
July 6, 1948.

H. L. FITCH
FILM PUNCH

2,444,732

Filed June 15, 1944

2 Sheets-Sheet 2



Harold L. Fitch

INVENTOR

BY *Morton M. Perrine*
J. Griffin Little
ATTORNEYS

UNITED STATES PATENT OFFICE

2,444,732

FILM PUNCH

Harold L. Fitch, Rochester, N. Y., assignor to
Eastman Kodak Company, Rochester, N. Y., a
corporation of New Jersey

Application June 15, 1944, Serial No. 540,431

3 Claims. (Cl. 88—14)

1

The present invention relates to a punch, and more particularly to a punch for use in connection with "V-Mail" film.

In order to expedite the delivery of letters, particularly between service men and women and their families, the "V-Mail" program was developed. Under this program, the sender writes the letter on a special form of paper which is then delivered to a recording station suitably situated near the writer. At this recording station, the letters are fed one after another into a recording machine to photographically record these letters, in miniature, on a roll of film. After this roll of film has been suitably processed, it is then run through a projecting apparatus, which projects the image of the letters onto a reviewing screen so that the operator may readily check up on any defects that may be present in the various images of the letters. If the roll is found satisfactory, it is then shipped, usually by plane, to a receiving station somewhere near the address of the receiver. At this receiving station, this roll of film is run through a projection printer to print the letters on a long strip of sensitized paper, a portion of which is shown in Fig. 7, and to be later more fully described. These reproduced prints are half the size of the original letter, and such a print is shown at the left of Fig. 7. The strip of printing paper is then cut up to separate the various letters which are then mailed to the addressees.

By means of this arrangement, the letters can be transported over long distances with a great reduction in both time and expense, the advantages of which are apparent. Furthermore, the received letter is an exact reproduction of the original, and thus preserves the personal touch so desirable in such letters.

It has been found, however, that when the letters are fed through the recording machine at the recording station, the operator may feed the letters too close together so that one letter may tend to overlap the next letter with the result that when the letters are printed the address of one of the letters may be partly or wholly blocked off, as shown at the center of Fig. 7. On the other hand, a corner of a letter may become folded over during the feeding operation and the print of such a letter will appear as shown at the right of Fig. 7 in which the reproduction of the folded corner partly cuts off the address of the receiver, as well as the complete address of the sender. In such cases, it is difficult, if not sometimes impossible, to definitely ascertain the correct address of the receiver or the sender, with the result that such

2

a long looked-for letter may never be received, the disadvantages of which are not only discouraging but highly undesirable. Also the folded corner, if folded at the bottom, may tend to block off part of the letter itself, the disadvantages of which are apparent.

In order to overcome these disadvantages, the present invention provides an arrangement by which the operator during the inspection of the film strip, before shipping, may suitably mark any defective image areas. Such areas are noted but the shipping of the film is not delayed. On the contrary, the film strip with its marked defective images is immediately shipped by plane to the receiving station located nearest the addressee. Then the original letter or letters corresponding to the defective images are located at the recording station and reprints on another film strip are made, and this reprint strip is subsequently shipped to the printing station. When the first strip reaches the receiving or printing station, projection prints are made thereof and the defective prints then appear as shown at the center and right of Fig. 7, the markings 70 thereon being sufficiently prominent to call the operator's attention thereto. The prints of these defective letters are then cut out and set aside until the second film containing the reprints is received. Thereupon prints of the retakes are made and a true reproduction of the original letter is then sent to the addressee. In this way, the delivery of all the letters is assured, but the first roll containing a few defective images is not held up pending the making of reprints or retakes of the defective images. The film strip is quickly delivered and the prints thereof reach the destination in the minimum of time, and then only the defective prints are delayed. This delay is, however, comparatively short and even such letters reach their destination far in advance of letters sent through the usual mail channels.

The present invention has, therefore, as its principal object the provision of a punch or mark for clearly and unequivocally designating defective or undesirable image areas in a film strip, thus assuring that suitable retakes will be made and that a proper print of the original letters will be forwarded to the addressee with minimum delay.

Another object of the invention is the provision of such a punch which is easy to operate, simple in construction, made of few parts of rugged construction, and effective in operation.

A further object of the invention is the provision of a punch that so marks the film strip that

3

a print thereof is readily detectable, thus assuring the delivery to the proper receiver or addressee of an exact and true reproduction of the complete original letter.

To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a view of the projecting apparatus for projecting an image of the film strip onto a viewing screen, showing the relation thereto of the punch of the present invention;

Fig. 2 is a front view of the projector itself showing the film gate and the aperture thereof, and the relation of the film punch and its actuating mechanism thereto;

Fig. 3 is a side view of the mechanism illustrated in Fig. 2;

Fig. 4 is a sectional view, on a larger scale than Fig. 2, taken substantially on line 4—4 of Fig. 2, showing the relation of the punch to the projector and the relation of the various punch parts and the actuating mechanism, the punch being shown in its lowered or inoperative position;

Fig. 5 is a view similar to Fig. 4 but on a larger scale than the latter, showing the punch in its elevated and film punching position;

Fig. 6 is a view of the film strip carrying the image of the letter showing the relation of the punch mark designating a defective or undesirable image area; and

Fig. 7 is a portion of the sensitized paper strip showing the prints of the various letters and the markings showing the undesirable prints.

Similar reference numerals throughout the various views indicate the same parts.

The present invention is embodied, in the present instance, by way of illustration only, in a film punch primarily adapted for use in connection with "V-Mail" film. As mentioned above, "V-Mail" letters are reproduced in miniature on a roll of film 11, and prints of the images of the film rolls are then reproduced on long strips of sensitized paper 12. These prints are made by projection and are half the size of the original letters. The reproduction of a suitable letter is shown at 13, Fig. 7. This reproduction, as well as the original letter, contains an area 14 for the censor's stamp, an area 15 for the receiver's name and address, an area 16 for the sender's name and address, and an area 17 for the letter itself, all as shown in Fig. 7. If the letters are properly fed in the recording machine at the recording station, the image area on a film strip will reproduce final prints such as shown at 13, Fig. 7. However, if the letters are fed too fast, the letters may tend to overlap, and when a final print is made, the upper part of one of the reproduced letters may be cut off, as shown at 18, Fig. 7, thus making it difficult if not impossible to ascertain either the receiver's or sender's name and address. On the other hand, an upper corner of the original letter may be inadvertently folded over while being fed into the recording machine. Obviously, the folded corner may block off all or a part of either or both the sender's or receiver's name and address as shown at 19, Fig. 7. Also a lower corner, not shown, may be folded over thus blocking out part of the letter itself, the disadvantages of which are obvious. Thus any defect which will block out any portion of the letter is highly undesirable.

4

However, to insure the receipt by the addressee of a suitable and correct reproduction of the original letter, the present invention provides a punch, broadly designated by the number 25 and later more fully described, for perforating or punching the defective or undesirable area or areas of the film strip 11, as shown at 41, Fig. 6. When such punched images are then printed they appear as shown at 26 and 27, Fig. 7 with black circles 70 indicating that such prints are undesirable and should not, therefore, be forwarded to the addressee. After the operator at the recording station has marked the film, as shown at 41, Fig. 6, a notation is made, and after the complete roll has been inspected, it is sent immediately on its way without waiting to make retakes of the letters corresponding to the punched area. The original letters corresponding to these areas are then located and new recording thereof made on a strip of film, the length of such strip depending, of course, on the number of such retakes. Upon receipt of this retake strip at the printing station, the operator makes new prints which then appear as at 13, Fig. 7. These correct prints are then forwarded to the addressee. The original defective prints 26 and 27 may then be destroyed.

Thus the defective prints are detected and marked during the inspection operation at the recording station, but the delivery of the film roll to the printing station is not delayed pending the making of retakes. On the contrary, the film roll having the few marked images is forwarded immediately and the retakes follow later; thus speeding up delivery of the properly reproduced letters. When the prints are made, the black circles 70, resulting from the punch aperture 41, immediately notifies the operator at the printing station that the prints, such as 26 and 27, are defective and should not be sent out. The marks 70 also notify the operator at the printing station that the defects were caught by the inspector at the recording station, and also that retakes will follow.

The projecting apparatus used in the inspecting operation at the recording station may be of any suitable and well-known construction. Fig. 1 shows one form of such a projecting apparatus which comprises a base 30 on which is mounted a projector 31, of well known construction, having a film gate 32 formed with a projection aperture 33. The film strip 11 to be inspected is carried by a supply reel 34, and is pulled horizontally through the gate 32 by a rubber covered roller 35 mounted on top of a housing 36 in which is positioned a drive motor, not shown, directly connected to the roller 35. From the latter, the film passes to the take-up reel 37 also mounted on the housing 36 and driven by means of belt-drive, not shown, from the shaft of the roller 35. As the present invention does not relate per se to the above described mechanism further details thereof are not deemed necessary to an understanding of the present invention.

The film strip 11 is thus pulled horizontally through the gate 32 past the projection aperture 33. The images on the film strip are projected by means of a projection lens 38 onto a suitable viewing screen, not shown. The lens 38 is carried by a plate 39 pivotally or rockably mounted at its lower end on the base 30. During such projection, the images are arranged horizontally and the printing matter is backwards, yet the operator can easily and readily detect any defects or undesirable portions of the image areas. When such

5

an area is encountered, a switch, not shown, is tripped to shut down the motor and stop the film feed. The operator then adjusts the film strip in the gate to bring the defective area back into position. However, as the image is horizontal and the reading is backwards, the operator cannot read the subject matter. In order that the image may be properly viewed, the plate 39 is pivoted to the position shown in Fig. 1 to bring a prism 40, carried by plate 39, into position in front of the aperture 32. This prism serves to both turn the image vertically and to reverse it so that it is in the normal vertical reading position so that it may be properly examined by the operator. The defect may then be noted and the proper data recorded for making subsequent retakes or remakes. The punch 25 is then actuated to punch the defective image area to form an aperture or perforation 41 therein, as shown in Fig. 6. Thus the defective area is properly marked for later identification.

The punch 25 of the present invention preferably comprises a hollow body portion 42 formed with spaced front and back walls 43 and 44 respectively, connected by side walls 45. The body portion 42 is adapted to slide vertically in a slot or groove 46 formed in the film gate 32, as best shown in Fig. 2. The back wall 44 is positioned behind the film gate 32, as shown in Figs. 4 and 5 and has secured thereto or formed integral with the upper end thereof a stationary punch member 47 formed with an aperture 48 adapted to receive the die 49 on the movable punch member 50 positioned in front of the gate 32 and pivotally mounted at 51 on the body portion 42.

It will be thus apparent that when the parts are moved to the position shown in Fig. 5, by mechanism to be later described, the punch members 47 and 50 will be positioned on opposite sides of the film strip 11 in the gate 32, and when the movable member 50 is moved to the right, the die 49 thereof will cooperate with the opening 48 of the stationary member 47 to form the perforation or punch 41 in the film strip.

The body portion 42 and the punch members 47 and 50 are normally arranged below the aperture 33 during projection. When, however, the film area is to be punched or perforated, the body portion 42 and punch members 47 and 50 are then lifted or moved vertically, as a unit, to bring the punch members 47 and 50 into alignment with the aperture 33 as shown in Fig. 5. Now when the punch member 50 is moved to the right it will cooperate with the stationary punch 47 to perforate the film. In order to position the members 47 and 50, means is provided for limiting or arresting the upward movement of the body portion 42. To secure this result, the slot 46 is terminated below the aperture 33 to provide a shoulder or abutment 52 adapted to be engaged by the upper edge 53 of the body portion 42 to limit the upward movement thereof to thus properly position the punch members 47 and 50 in the aperture 33 and on opposite sides of the film strip 11 in the gate 32, as clearly shown in Fig. 5.

It is apparent, that the body portion 42 and the punch members 47 and 50 will first be moved vertically from the inoperative position shown in Fig. 4 to the operative position shown in Fig. 5. Then the punch member 50 is pivoted on the body portion 42 to move relative thereto and to the stationary punch member 47 and to cooperate with the latter to punch or perforate the film. To secure this dual movement of the punch member 50, a shaft 54 is mounted on the base 30 and

6

has secured to one end thereof an operating handle 55 by which the shaft 54 may be rocked in opposite directions. A coil spring 56 connected to the shaft 54 serves to return the shaft and handle 55 to the position shown in Fig. 2, for reasons to be later described. The other end of the shaft 54 has connected thereto a radially extending arm 57 the free end 58 of which extends between the front and back walls 43 and 44 of the body portion 42, as clearly shown in Figs. 2, 3, 4, and 5. One face 59 on the end 58 slides along the inner surface 60 of the wall 44 while the other face is beveled off, as shown at 61, Figs. 2, 3, 4, and 5.

During the projection of the film strip 11, the punch parts and the actuating mechanism therefor are in the position shown in Figs. 2, 3, and 4. When, however, the film is to be punched, the plate 39 is first pivoted to bring the prism 40 into position to properly project the image of the film in the correct reading position on the viewing screen. The handle 55 is then moved to the right, as viewed in Fig. 2. Such movement serves to rock the shaft 54 in a clockwise direction to similarly move the arm 57 upwardly until the beveled portion 61 thereof engages with a similarly beveled portion 62 formed on the lower end 63 of the movable punch member 50. Upon such engagement the end 58 of the arm 57 is then wedged between the lower end 63 of the punch member 50 and the inner surface 60 of the back wall 44. Further rocking of the shaft 54 then causes the end 58 to lift the body portion 42 and the punch members 47 and 50 as a unit therewith until the parts reach the position shown in Fig. 5, whereupon the upper edge 53 of the body portion 42 engages the shoulder 52 formed at the upper end of the slot 46 to limit the upward movement of the body portion and the punch members.

The parts are then in the general position shown in Fig. 5 with the punch members 47 and 50 positioned in the aperture 33 and on opposite sides of the film strip 11. Further movement of the handle 55 rotates the shaft 54 and the arm 57 to move the end 58 upwardly between the lower end 63 of the punch member 50 and the surface 60 of the wall 44. Such movement causes the punch member 50 to move in a clockwise direction about its pivot 51 to force the die 49 thereof through the film 11 to cooperate with the opening 48 of the stationary punch member 47 to punch or perforate the film, as shown at 41, Fig. 6.

Upon release of the handle 55, the spring 56 returns the handle 55, shaft 54 and arm 57 to the position shown in Figs. 2, 3, and 4. Such movement causes the end 58 to be withdrawn from engagement with the end 63 of the punch member 50. The latter is now rotated in a counterclockwise direction about its pivot by means of a coil spring 65 positioned intermediate the end 63 of the member 50 in the front wall 43 to draw the die member 49 from the film 11. During such withdrawal, the film is stripped from the die 49 by means of a stripping plate 66 carried by the punch member 50 and through which the die 49 passes when punching the film. When the piece has been punched from the film, it has been found on some occasions that such a piece may reach and stick onto the projector lens. In order to eliminate any such possibility, a guard plate 67 secured to the back wall 44 and extending up behind the opening 48 of the stationary member 47 is provided. Now when the film is punched, the separated piece will not strike the

lens but rather will strike the guard plate 67 and will drop down to a suitable point of disposal, thus eliminating any possibility of the separate piece reaching and sticking to the lens of the projector.

When the end 58 of the arm 57 has returned to its inoperative position shown in Figs. 2, 3, and 4, the body portion 42 and the punch members 47 and 50 may also be returned to the inoperative position shown in these figures by means of gravity or by a spring. It is preferred, however, to positively return the parts to their inoperative position to insure the complete removal of the punch members from the aperture 33 during the projecting and inspecting operations. To this end, the lower end of the front wall 43 of the body portion 42 is provided with a screw 68 positioned in the path of the end 58 of the arm 57. Now as the spring 56 returns the end 58 to its inoperative position, the lower edge 69 thereof strikes the screw 68 to move the body portion 42 and the punch members 47 and 50 downwardly as a unit so as to move the punch members out of the aperture. The parts are then in the position shown in Figs. 2, 3, and 4, and the film strip may be again moved for examination, the plate 39 being, of course, pivoted to bring the projecting lens 38 into position.

It is apparent from the above description that the present invention provides a film punch which normally is in an inoperative position, but when the film is to be punched the punching members are moved up into position and actuated to punch or perforate the film. While the punch has been shown in connection with photographic film bearing an image, it is apparent that such a punch has a wide range of other applications. For this reason, the term "film" is used in a generic sense to cover all strip materials capable of being punched or marked to provide an indication or mark to be used as a later reference to designate a defective or undesirable part of the strip.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive idea may be carried out in a number of ways. This application is, therefore, not to be limited to the precise details described, but is intended to cover all variations and modifications thereof falling within the scope of the appended claims.

I claim:

1. A film punch comprising in combination a support, a body portion movably mounted on said support, a stationary punch member formed on said portion, a movable punch member pivoted on said portion, a lever rockably mounted on said support, means on said lever for operatively connecting the latter to said portion so that movement of said lever in one direction will lift said body portion and said members as a unit to position the latter on opposite sides of said film and will then move said movable member toward said stationary member to punch said film, means on said support for limiting the lifting movement of said portion to position said members in film punching relation, means on said support for moving said movable member away from said stationary member when said lever is moved in the opposite direction to lower said portion and members, and means for stripping the film off said movable member when the latter is moved away from said stationary member after the film has been punched.

2. In a projecting apparatus, the combination

with a projector having a film gate formed with a projection aperture adapted to frame an image area to be projected, of a body portion movably mounted on said gate and carrying a pair of punch members normally positioned below said aperture and on opposite sides of said gate, a lever rockably mounted on said projector, means for operatively connecting said lever with said portion whereby movement of said lever in one direction will lift said portion and members as a unit to position the latter on opposite sides of the film area in said gate, cooperating members on said gate and portion for limiting the lifting movement of said portion to bring said members into registry with said aperture, cooperating parts on said lever and one of said members, means for rendering said parts operative upon further movement of said lever in said one direction to move said one member towards the other member to punch said film, and means operative upon movement of the lever in the opposite direction to move said members away from each other to release said film, said movement of said lever in said opposite direction serving to disconnect said lever from said body portion to permit said members to move downwardly and out of said aperture.

3. In a projecting apparatus, the combination with a projector having a film gate formed with a projection aperture adapted to frame an image area to be projected, of a body portion movably mounted on said gate, a stationary punch member formed on said portion and positioned on one side of said gate, a movable punch member pivotally mounted on said portion and positioned on the opposite side of said gate, a spring engaging said movable member and tending to move the latter away from said stationary member, a lever rockably mounted on said projector, means on said lever engaging said movable member so that movement of said lever in one direction serves to first lift said portion and members as a unit toward said aperture with the members on opposite sides of said film, means on said projector for limiting the lifting movement of said portion to position said members in registry with said gate, cooperating parts on said lever and said movable member, means for rendering said parts operative upon further movement of said lever in said one direction to pivot said movable member on said support to move said movable member toward said stationary member to punch said film, the movement of said lever in the opposite direction first serving to move said parts out of cooperating relation to render said spring operative to move said movable member away from said stationary member and to then move said lever away from said portion to permit said portion and members to move downwardly as a unit and out of said aperture, and means carried by said movable member for stripping the film therefrom when moved away from said stationary member.

HAROLD L. FITCH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
487,737	Hollerith	Dec. 13, 1892
1,005,562	Lease	Oct. 10, 1911
1,232,418	Akeley	July 3, 1917
2,177,788	Ross	Oct. 31, 1939