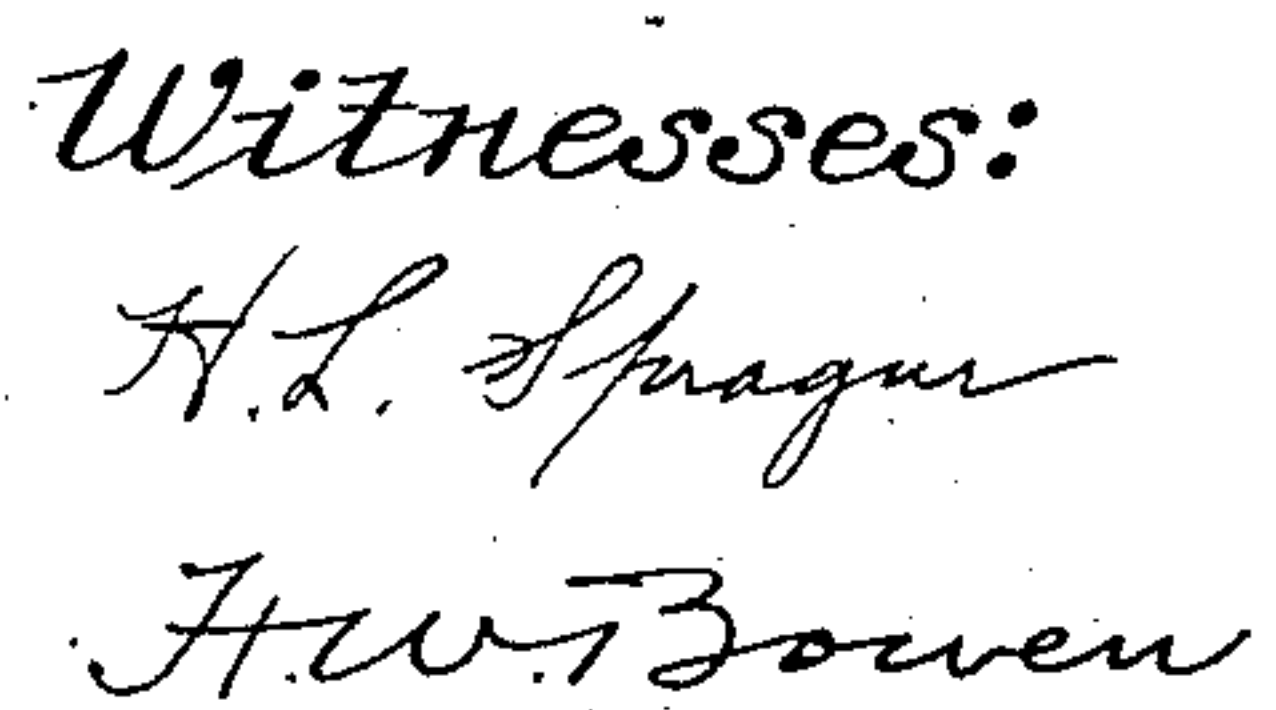


DEVICE FOR DETECTING INACCURATELY FED SHEETS OF PAPER.

908,412.

3 SHEETS—SHEET 1.



Inventor,
Matthias M. Kandle
by Chapin & Co
Attorneys.

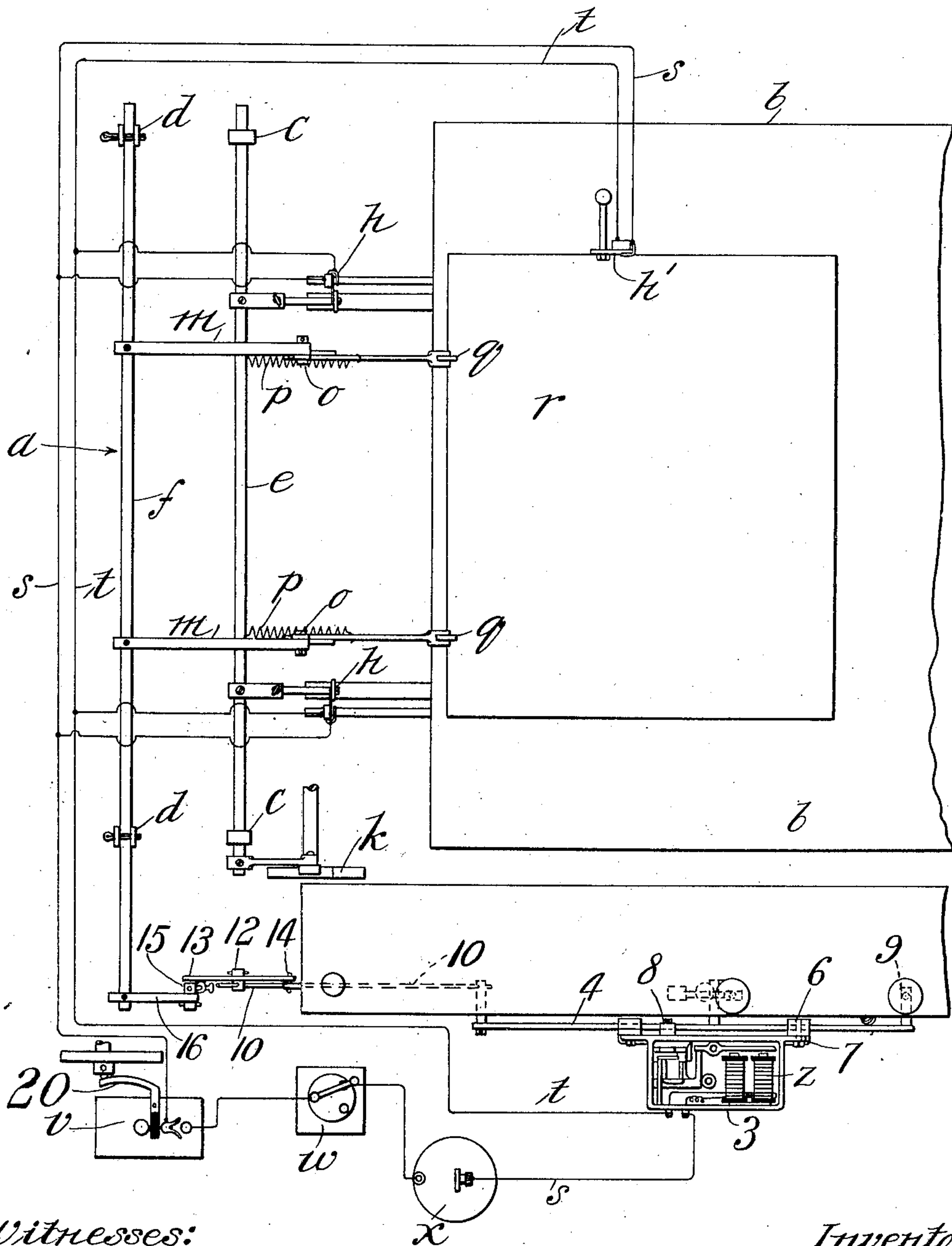
M. M. KANDLE.
 DEVICE FOR DETECTING INACCURATELY FED SHEETS OF PAPER.
 APPLICATION FILED JAN. 10, 1908.

908,412.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
H. L. Sprague
H. W. Bowen.

Inventor,
Matthias M. Kandle.
 by *Chapman & Co.*
 Attorneys.

M. M. KANDLE.
 DEVICE FOR DETECTING INACCURATELY FED SHEETS OF PAPER.
 APPLICATION FILED JAN. 10, 1908.

908,412.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 3.

Fig. 3.

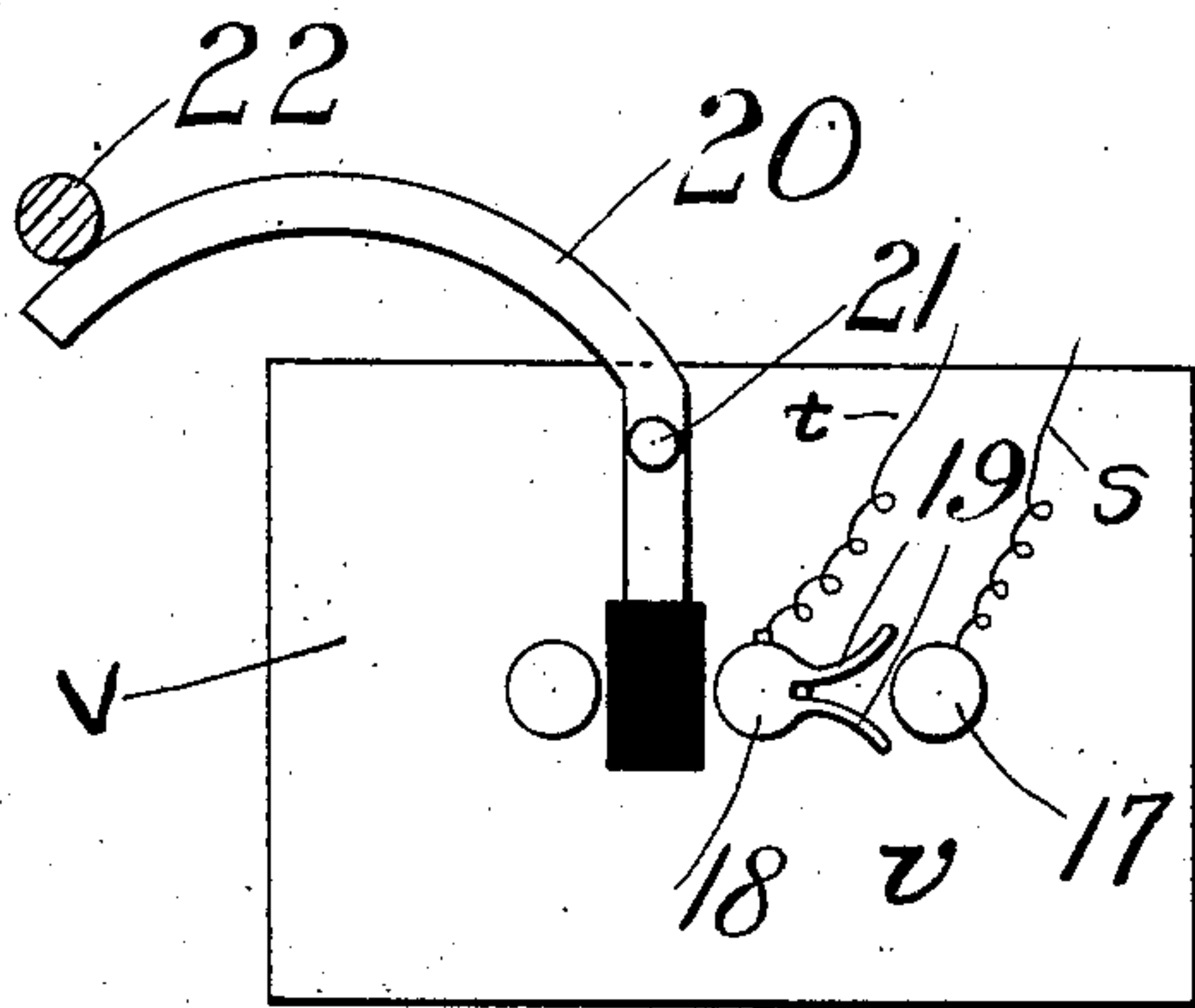


Fig. 5.

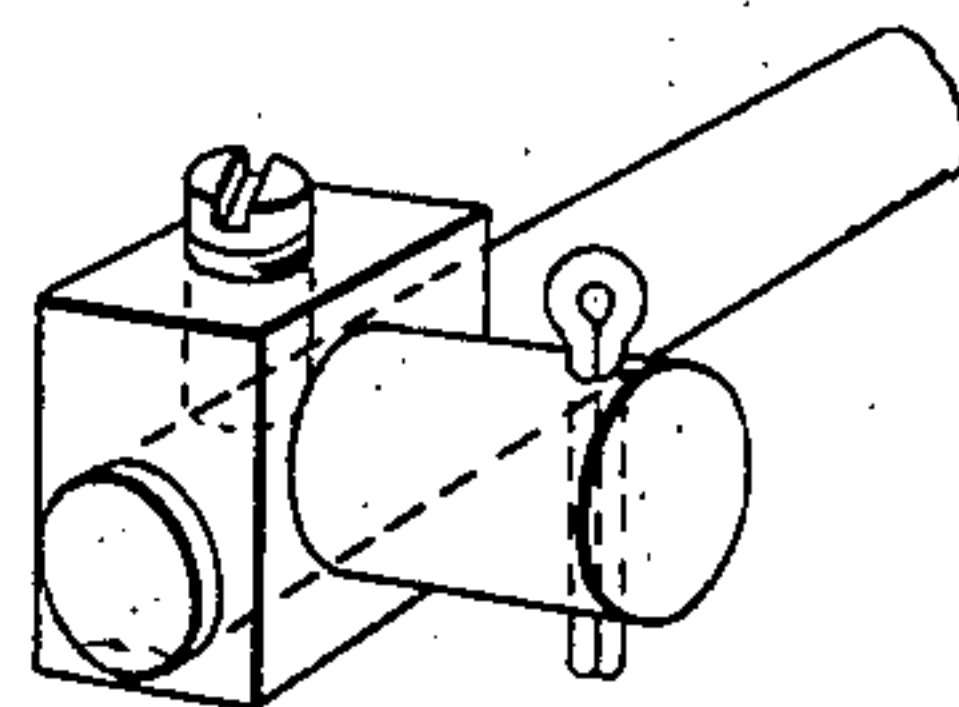
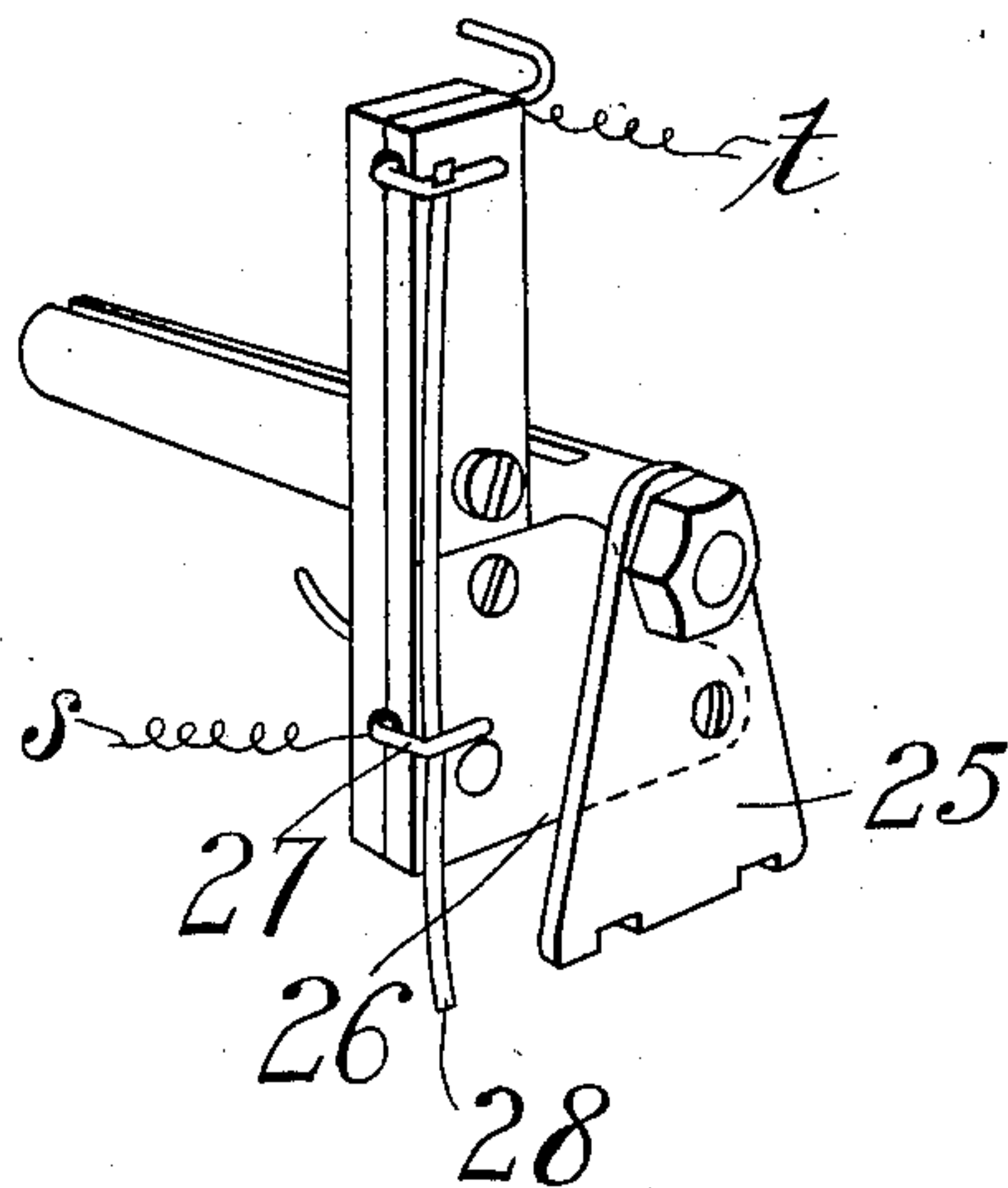
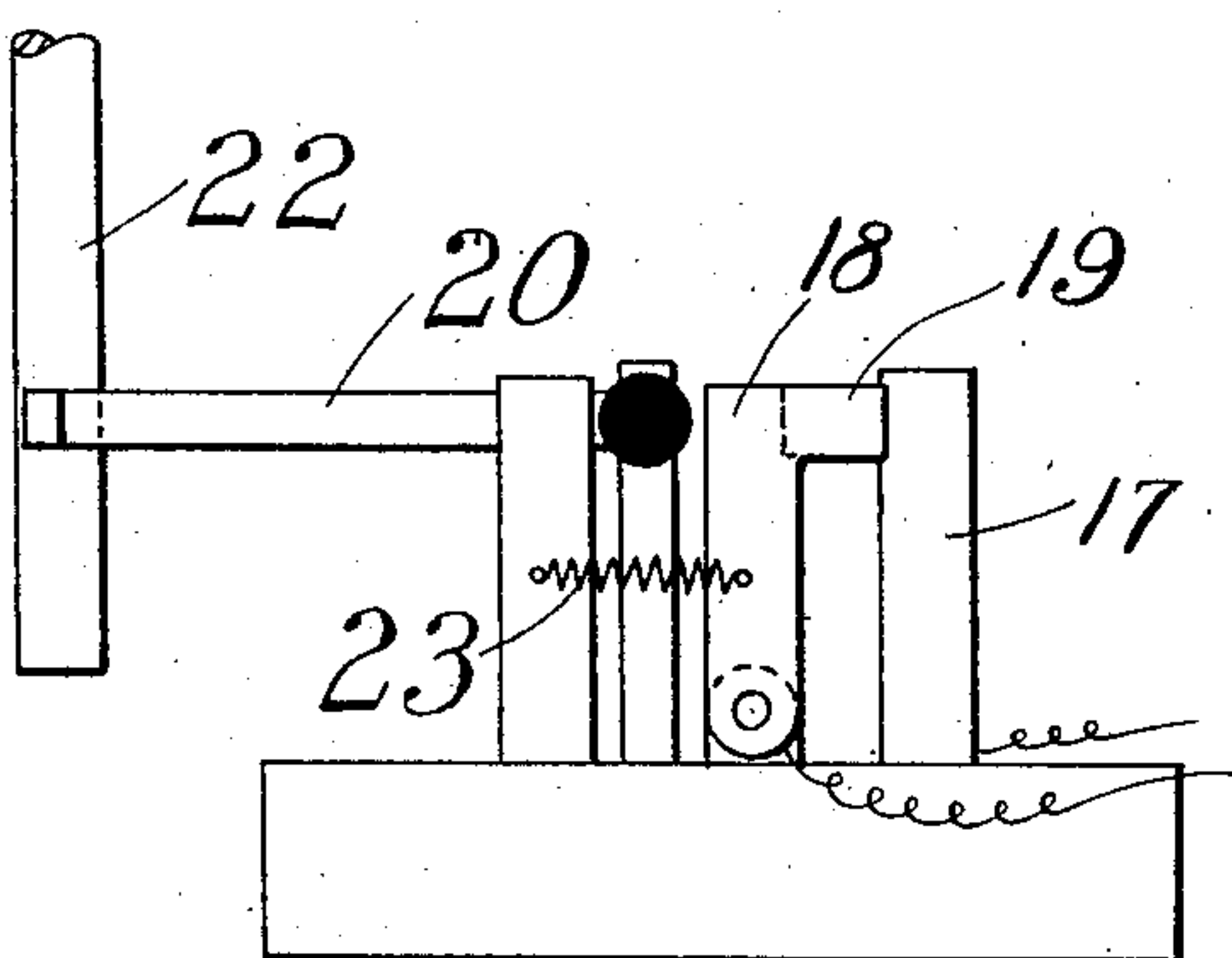


Fig. 6.

Fig. 4.



Witnesses:

H. L. Sprague

H. W. Brown

Inventor,
Matthias M. Kandle
 by *Chapin & Co.*
 Attorneys.

UNITED STATES PATENT OFFICE.

MATTHIAS M. KANDLE, OF LONGMEADOW, MASSACHUSETTS, ASSIGNOR TO SPRINGFIELD PRINTING & BINDING COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION.

DEVICE FOR DETECTING INACCURATELY-FED SHEETS OF PAPER.

No. 908,412.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed January 10, 1908. Serial No. 410,132.

To all whom it may concern:

Be it known that I, MATTHIAS M. KANDLE, a citizen of the United States of America, residing at Longmeadow, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Devices for Detecting Inaccurately-Fed Sheets of Paper, of which the following is a specification.

This invention relates to printing, and the object thereof is to provide a device whereby inaccurately fed sheets of paper may be detected before they have been drawn into the press; and, coacting with said detecting device, a suitable mechanism to trip the press.

The mechanism embodying the invention may be applied to any press adapted to the printing of separately fed sheets, either hand-fed or automatically fed.

The invention is fully illustrated in the drawings forming part of this application in which,—

Figure 1 is a side elevation of the device in its preferred form as applied to a cylinder press, only such detached parts of the latter being shown as are necessary to a complete understanding of the invention. Fig. 2 is a plan view of Fig. 1, the electrical circuits being shown in a diagrammatic form for the sake of clearness. Fig. 3 is a plan view of a switch for periodically making and breaking an electric circuit by the movement of some part of the machine. Fig. 4 is a side elevation of the switch shown in Fig. 3. Fig. 5 is a perspective view of an adjustable swivel connection for certain moving parts of the device. Fig. 6 is a perspective view of one of the guides whereby the accurate positioning of the sheet is effected.

Referring to these drawings, *a* is the cylinder of a printing press; *b* the feed table; *c* and *d* are rigid supports for two rock-shafts *e* and *f*. The rock-shaft *e* carries, adjustably mounted on the short arms *g*, two guides *h*, *h*, such as shown in Fig. 1, a third guide *h*¹ being adjustably mounted on the feed table *b* and rectangularly disposed relative to the guides *h*. As in all presses these guides are adjusted to accurately position a sheet of any size to be fed to the machine.

The rock-shaft *e* is swung upward, as by a cam *k*, to allow the sheet caught by the grip-

pers on the cylinder (not shown) to be drawn into the machine.

On the shaft *f* are mounted the jointed push-arms *m*, *m*, Figs. 1 and 2, the two members thereof being pivoted together at *o*, the member on the shaft *f* being secured on the same to swing with it, and a spring *p* extending from this member to the other one holds the latter yieldingly against a suitable stop, the tip of the second member being shod with a piece of rubber or like substance *q* normally supported just above the table *b*, as seen in Fig. 1. The oscillation of the shaft *f* in the direction of the arrow will therefore cause the rubber shod tips of the push arms to swing down onto a sheet of paper *r*, Fig. 2, on the table, and after contact therewith the free forward member of the push-arms will tend to straighten out into alinement with the other against the tension of the spring *p*, and thus push the sheet *r* away from the guides *h*, *h*. This movement of the push arms *m*, *m* will take place whenever the sheet of paper *r* fails to contact with each of the three guides *h*, *h*, and *h*¹ when moved forward to feeding position. It does not follow from this that the invention is limited positively to the use of three guides, though this is the usual arrangement, but it is to be understood that the contact of the sheet with all of the guides necessary to insure its proper presentation to the grippers is necessary, or the arms *m*, *m* will reject the sheet and push it back out of the way.

Referring now particularly to Fig. 2, it will be seen that all of the guides *h*, *h*, and *h*¹ are in an electrical circuit consisting of the line wires *s* and *t*, in which circuit is also included the make and break switch *v*, periodically closed in time with the rotation of the cylinder *a*; the second switch *w* which may be moved by the operator to open or close the circuit manually; the battery *x* and the electro magnet *z*, which forms part of a latch-locking device, indicated as a whole by 3, a latch being locked by this device in position to support the lever 4 pivoted at 6 on the frame 7, the latch engaging the lever at the point 8, Fig. 2 and supporting it in the position shown in Fig. 1 against the tension of the spring 9. To that end of the lever 4 opposite to that to which the spring 9, is attached, is connected the rod 10 by one

end, the opposite end of which passes through a swiveled stud 12 on the arm 13, which arm may swing in a vertical plane on the pivot 14. To the free end of this arm is secured another stud like the stud 12, and secured therein is a vertically disposed rod 15 extending upward and connected pivotally with an arm 16 fixed on the rock-shaft *f*. If, therefore, the locking device which holds the latch in supporting position under the lever 4 be withdrawn, the tension of the spring 9 will cause the opposite end of the lever to swing down and oscillate the rock-shaft *f*, bringing the push arms down onto a sheet on the table *b* and push the same back away from the guides *h*, *h*, and this will occur at the time the grippers on the cylinder *a* are ready to take hold of a sheet of paper fed to the press to draw it into the latter, if at that time the electric circuit is not broken by the contact of the sheet of paper with each of the guides *h*, *h*, *h*¹ whereby the sheet is accurately positioned, and the operation of these devices to accomplish this is as follows: By referring to Figs. 3 and 4, it will be seen that the switch *v* consists of two parts 17 and 18 to which the line wires *s* and *t* are connected. One of the parts is stationary, as 17, and the other is movable, and may be provided with suitable means to make an effective contact with the part 18, as for instance, by means of the spring jaws 19. This movable part 18 is periodically moved into contact with the part 17 just an instant before the moment that grippers on the cylinder *a* are in position to take hold of a sheet of paper to pass it through the press, and this movement of the part 18 into contact with the part 17 will thus close the circuit; and whenever the circuit is closed the magnet *z* will be energized and the locking latch (which holds the lever 4 in the position shown in Fig. 1) will be released, the push-arms *m* being brought quickly down onto a sheet on the feed table to push it out of the reach of the grippers.

The breaking and making of the circuit by the device *v* may be effected in any suitable way. For example, an angular lever 20, pivoted at 21, may have one of its arms in contact with the movable member 18, the other arm being curved and lying in the path of movement of a part 22 of the machine which is in time with the cylinder *a*. This angular lever moves the part 18, and a spring 23 swings it in the opposite direction. Any other similarly operating device may be used instead of that described above, if desired. It is to be borne in mind, however, that the periodic closing of the circuit does not take place until an instant prior to the time for the sheet to be grasped by the grippers, and therefore if before that time the circuit be broken at some other point the contact of the parts 17 and 18 will not be

effective to energize the magnet *z*, and thus the push arms will remain suspended over the feed table.

Means are provided to break the circuit on the guides *h*, *h*, and *h*¹ by means of the sheet of paper but only in case the sheet is positioned with accuracy against all of the guides, on each of which is located a make and break device to be described. Hence, if there be three guides, as in these drawings, and the sheet of paper is so positioned relative thereto that the circuit will be broken on only two of them, then the periodic closing of the circuit above described an instant later will be effective to cause the actuation of the push-arms to reject the sheet.

The guides *h*, *h* and *h*¹ may be of the usual construction and one of them is shown in Fig. 6. The part 25 is that against which the edge of a sheet abuts to insure its correct position, and near this part is a slender spring finger 26 constituting one terminal of a make and break device in the electric circuit, the other terminal being the piece 27 in the shape of a hook, against which the spring finger normally bears, the hook 27 being so located that the lower end 28 of the finger extends a little beyond the face of the part 25 of the guide *h*. The two terminals 26 and 27 are insulated from their supports.

From the above description it is clear that when a sheet is moved up against the guides the electric circuit in which they are all located will be broken, if the edges of the sheet are brought into contact with each of the parts 25 of the guides, and therefore when an instant later the periodic contact is made in the device *v*, the circuit will still remain open. Failure to break the circuit at any of the guides by reason of an inaccurately placed sheet will, as stated above, result in its rejection.

As usual, the front guides *h*, *h* are periodically lifted by the oscillation of the rock-shaft *e* to allow the sheet, when taken by the grippers, to pass under them; and the make and break device *v* is so timed that the circuit at that point is broken just as the guides lift so that the release of the fingers 26 by said lifting movement will not result in a closed circuit which would cause the actuation of the push-arms.

Associated with the above described means for preventing the feed of an inaccurately placed sheet into the press, is a device for stopping the press when the arm 4 is released to effect the actuation of the push-arms, and this device is constructed and arranged as follows: The end of a shaft 29 extends out over, or nearly over, the arm 4 and is provided with a crank-arm 30. The arm 4 is provided with a hook 31 which extends up to, and over the upper edge of this crank-arm. The oscillation of the shaft 29

will stop the press, this shaft being the usual trip shaft. Now, when the arm 4 swings downward, the hook 31 pulls the crank-arm 30 down and thus effects the oscillation of the shaft 29. The crank-arm is provided with a spring 32 which raises the crank-arm again to the position shown in Fig. 1, when the arm 4 is returned to the position shown in that figure, which return movement is effected by means of a push-rod 33 actuated by the foot of the pressman, and for that purpose extends up through the foot-board 34. Similarly a push-rod 35 is attached to the arm 4, to enable the pressman to trip the press independently of the electrical devices above referred to, that is, independently of the movement of the arm 4.

By the use of the herein before described mechanism on a printing press the following points of utility are attained: Improper registration is prevented and consequently all of the evil effects attendant thereon are eliminated; for example, the registration may be so imperfect that part of the sheet may run off of the type bed which may result in battered types or cuts which may necessitate renewal at the cost of considerable time and expense, or the sheets may be picked up on the ink rollers making it necessary to remove them from the press, or again it may result in what are termed "skips" or printing on the packing of the cylinder which would cause the characters to appear on the back side of the following sheets; all of these defects, of course, resulting in a waste of stock.

The switch *w* may be operated at any time to render the electrically operated devices herein described inoperative and may be placed in any convenient position within reach of the pressman.

In this specification the word "stop" when used as describing the means to stop the press whenever a sheet is imperfectly presented to the guides as described, is used synonymously with the word "trip," it being of course well understood that these words "trip" and "stop" are applied to the art generally respectively to automatic and hand-fed presses; but to save confusion the word "stop" has been used almost exclusively herein to designate the means whereby the press is rendered for the moment inoperative.

What I claim, is:—

1. In combination with a printing press, a plurality of guides for properly positioning a sheet of paper, a device on each guide adapted to be actuated by the sheet of paper during the positioning operation, means operatively connected with the guides to trip the press if any one of said guides is not

operated by the sheet during the positioning of the same, and means for rejecting the improperly positioned sheet.

2. In combination with a printing press, a plurality of guides for determining the position of a sheet of paper fed to the press, an electro magnetic element, electrical connections between the guides and said element, the connections being such that the electro-magnetic element will be operated if any of the guides are not engaged by the sheet of paper, and means actuated by said element to reject the inaccurately fed sheets of paper.

3. The combination with a printing press, of a device to engage and move a sheet of paper away from feeding position, and an electrically actuated device to hold said device inoperative; guides for the paper, and means to lift the same; a normally open electric circuit comprising a source of electricity, and a make and break device periodically actuated in time with the movement of the device to feed a sheet into the press, and comprising also a make and break device on the guides, whereby the circuit may be opened at the guides by a correctly placed sheet just prior to the periodic closing of the circuit by the movement of the machine.

4. The combination with a printing press, of push-arms to engage and move a sheet of paper away from feeding position, and means to actuate said arms; mechanism to hold said arm-actuating means in inoperative position and comprising an electro magnet; suitable guides to accurately position sheets of paper to be fed to the press; an electrical circuit comprising make and break devices on the guides whereby the circuit may be interrupted by a correctly positioned sheet and another make and break device periodically actuated by the movement of the machine in time with the movement of suitable feeding devices to carry a sheet of paper into the press, whereby if said circuit is not interrupted by a correctly positioned sheet, said electro-magnet will be energized to effect the actuation of said push-arms to engage and remove the sheet as described.

5. In combination with a printing press, a plurality of stop devices for alining a sheet of paper, said devices being arranged in rectangular relation to each other and included in an electric circuit, a make and break device on each stop, push-arms, and means for actuating said arms when the circuit is unbroken at each of the stop devices by the sheet of paper.

MATTHIAS M. KANDLE.

Witnesses:

K. I. CLEMONS,
H. W. BOWEN.