

Oct. 18, 1932.

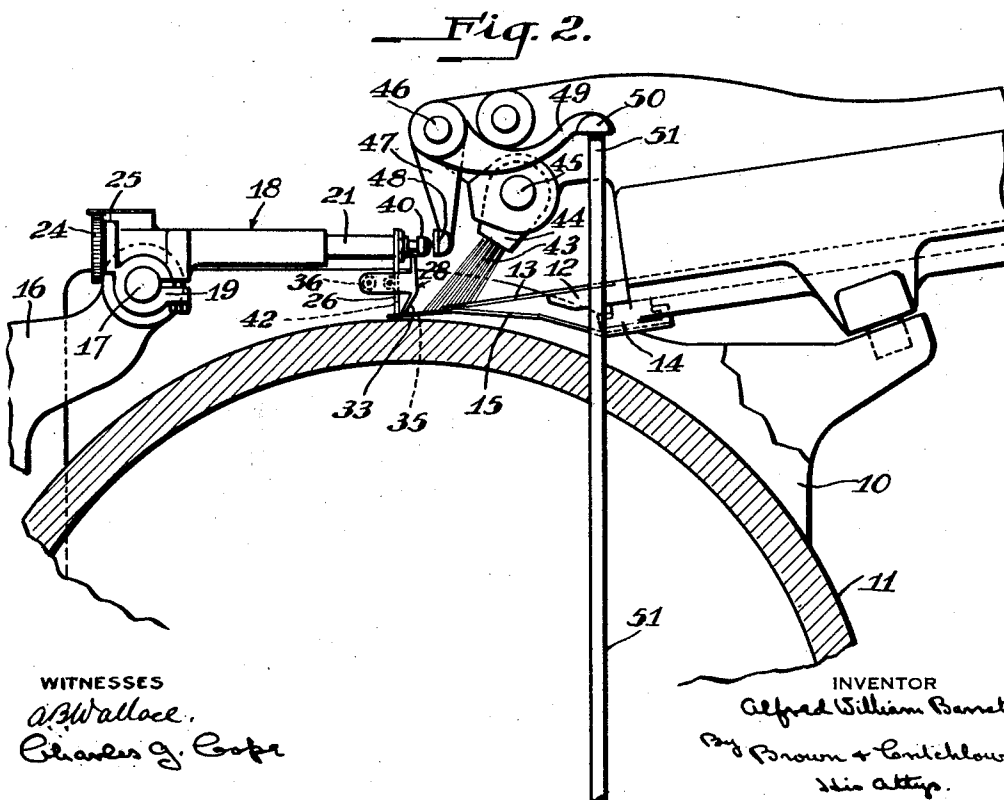
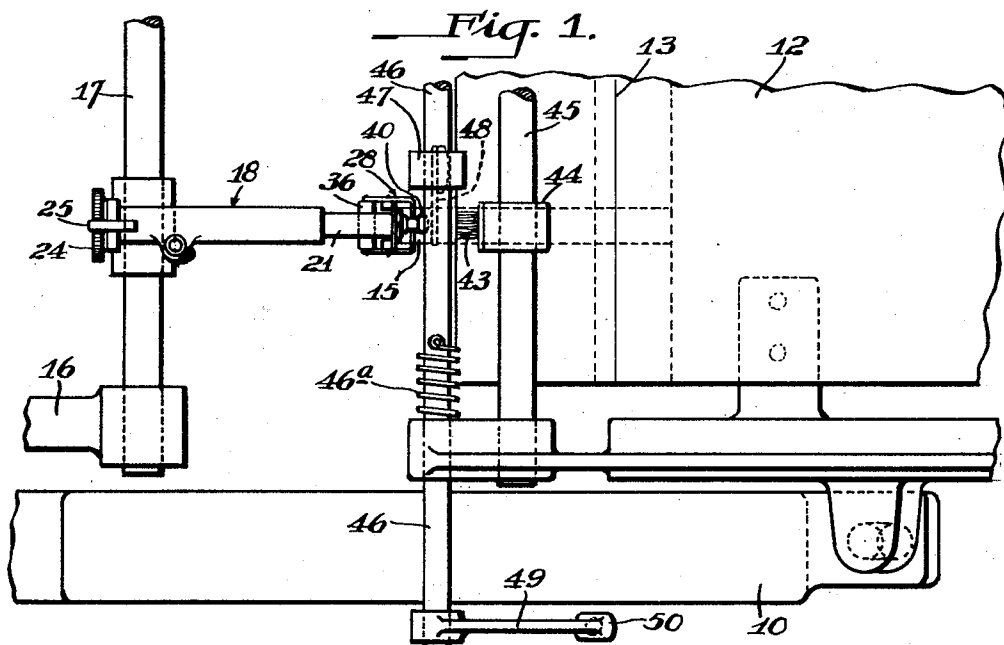
A. W. BARRETT

1,883,471

SHEET DETECTOR

Filed Feb. 10, 1930

2 Sheets-Sheet 1



WITNESSES
A. B. Wallace.
Charles G. Cooper

INVENTOR
Alfred William Barrett
By Brown & Connelley
His Atty.

Oct. 18, 1932.

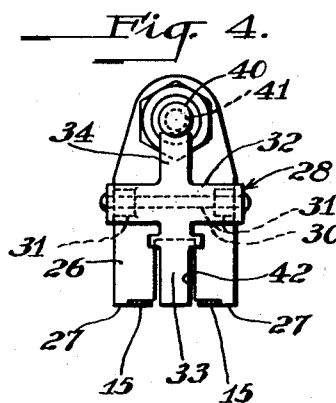
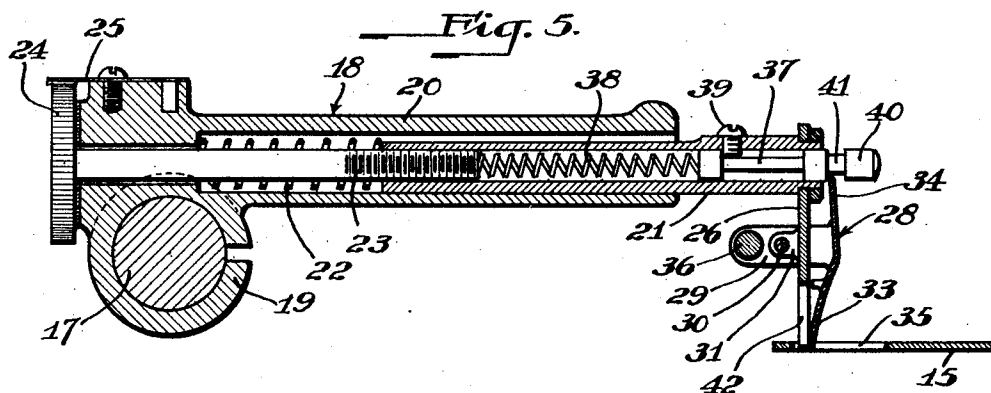
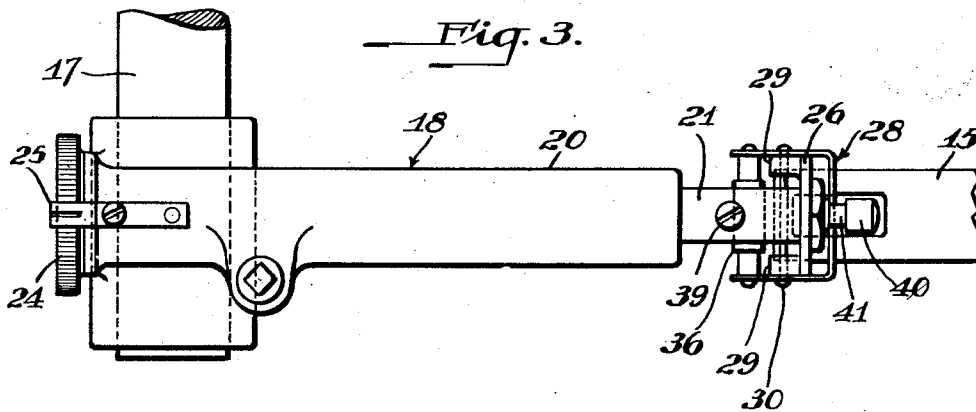
A. W. BARRETT

1,883,471

SHEET DETECTOR

Filed Feb. 10, 1930

2 Sheets-Sheet 2



WITNESSES

A. B. Wallace.
Charles J. Cooper.

INVENTOR

Alfred William Barnett
By Brown & Critchlow
His Atty.

UNITED STATES PATENT OFFICE

ALFRED WILLIAM BARRETT, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO MILLER
PRINTING MACHINERY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION
OF PENNSYLVANIA

SHEET DETECTOR

Application filed February 10, 1930. Serial No. 427,151.

My invention pertains to sheet detectors for printing presses, that is to say, devices for detecting the failure to feed a sheet when such occurs, and relates especially to sheet detectors for use in cylinder printing presses at the point where the blank sheets are taken from the feed table by the cylinder.

In the operation of cylinder printing presses, it is common to lay, either automatically or by hand, each sheet upon a feed table, with its leading edge abutting against a pair of front guides; whereby the sheet is registered endwise. The cylinder grippers seize the sheet from the feed table during the rotation of the cylinder; the front guides being raised at the proper instant, to allow the sheet to be drawn off the feed table by the cylinder. Should a sheet not have been fed to the front guides at the time the cylinder grippers close to take a sheet, a printing impression would be made on the cylinder, which impression would be reproduced, by offset, upon the backs of a number of following sheets, when fed to the press. To meet this situation, various automatic mechanisms have been put in use, designed to throw off the impression of the press whenever failure occurred in the feed of a sheet, but difficulty has been experienced in attaining the requisite degree of delicacy of working, and in rendering the device sufficiently certain in its operation when sheets having curled or upturned edges, torn edges, or the like, are encountered.

It is the principal object of my invention to provide a sheet detector which will work with exceptional delicacy, and which will operate with entire certainty in spite of the fact that the sheets being fed to the press may present obstacles to easy handling, such as having curled leading edges, or the like.

A sheet detector constructed in accordance with my invention is described by way of example in the following specification, and shown in the accompanying drawings, in which:

Fig. 1 is a plan showing a portion of a frame, feed table, and one of the front guides of a cylinder printing press, the front guide having a sheet detecting member constructed

in accordance with my invention applied thereto;

Fig. 2 is a side elevation of the same, the press frame being omitted and the impression cylinder shown in section;

Fig. 3 is an enlarged plan of one of the front guides;

Fig. 4 is an end view of the same; and

Fig. 5 is a vertical section taken through the front guide and the feed table tongue with which it cooperates.

The press indicated in the drawings includes a frame 10 in which is rotatably supported, in the usual manner, a cylinder 11, and with which is associated a feed table 12 upon which the blank sheets are fed, either by hand or automatically, into a position in which they are correctly placed for being drawn away by grippers on the cylinder 11. At the front end of the feed table, is a lip plate 13, the leading edge of which comes close to the cylinder; and beneath the feed table is mounted a guide bar 14 upon which are supported a pair of tongues 15 of which only one is shown, these tongues being adjustable laterally of the feed table. The front ends of the tongues 15 extend beyond the lip plate 13 and come into close proximity with the cylinder surface.

In suitable members such as that indicated at 16 is mounted a cross bar 17 upon which are secured a pair of front guides 18, one only of which is shown. Each front guide consists of a casting 19 having a tubular portion 20 in which is slidably mounted a stem 21, a spring 22 being interposed between the stem and the casting, and tending to press the stem 21 outwardly. Passing longitudinally through the casting 19 and threaded into the stem 21 is a screw 23 having at its outer end a knurled head 24 with which engages a detent spring 25 mounted on top of the casting. To the front end of the stem 21 is secured a gauge plate 26 having ears 27 extending downwardly therefrom and spaced apart a distance something greater than the width of the associated tongue 15, so that when the gauge plate rests upon the tongue the ears will extend downwardly on each side of the latter, as shown in Fig. 4,

thereby preventing the edge of the sheet from entering beneath the gauge plate. A fine adjustment of the gauge plate towards and from the feed table can be effected by rotating the knurled head 24 manually, such head being retained in its adjusted position by means of the detent spring 25. By manipulating the knurled heads 24 of the two front guides, and by adjusting a side register device on the feed table (of which many kinds are well known in the art), the position of the sheet on the cylinder can be determined with great accuracy. The sheet is, of course, fed against the gauge plates 26 of the front guides, so that its front edge is exposed, except for those portions which lie on the tongues 15. From this position it is withdrawn by the grippers on the cylinder 11, the front guides being made to rise, in a well known manner, to permit this.

For detecting the presence or absence of a sheet at the gauge plates 26 of the front guides, each gauge plate has pivoted thereto a detecting member 28, which includes a pair of arms 29 connected by a pin 30 which is pivotally mounted in ears 31 extending rearwardly from the gauge plate. The arms 29 are connected by a front portion 32 having a downwardly extending leaf 33 and an upwardly extending leaf 34. The downwardly extending leaf 33 is adapted to enter a slot 35 formed in the associated tongue 15, and the arms 29 are provided with a counterweight 36 which tends to swing the whole detecting member 28 into a position in which the leaf 33 stands in the slot 35 in a position in advance of the gauge plate 26, as indicated in Fig. 5.

The stem 21 is made hollow and contains a plunger 37 which is normally pressed outwardly by means of a spring 38 disposed between said plunger and the end of the screw 23, the possible outward movement of the plunger being limited by a screw 39. The plunger protrudes from the front end of the stem 21 and is formed at that point with a head 40 having an annular groove 41 formed therein. The position and dimensions of the parts are such that when the detector member is in its normal position, shown in Fig. 5, its upper leaf 34 will be disposed in the groove 41, and will prevent movement of the plunger inwardly with respect to the stem 21. When, however, a sheet is fed correctly, so that its edge comes into registering engagement with the gauge plate 26, such edge will push the lower leaf 33 forward, rocking the detector member about its pivot, and cause such lower leaf to enter a slot 42 formed for the purpose in the gauge plate 26. Such rocking movement of the detector member will cause its upper leaf 34 to swing forward into a position in which it no longer enters the groove 41 of the plunger 37. In these circumstances, the plunger 37 is free to move

inwardly with respect to the sleeve 21. It is the fact of whether or not the plunger 37 is free for inward movement that controls whether the press shall continue to print, or whether it shall be stopped or its impression shall be thrown off.

In order to stiffen the front edge of the sheet, and also iron out any curliness of such front edge, brushes 43 are provided, one for each front guide. These brushes are carried in holders 44 which are mounted for lateral adjustment upon a cross bar 45 associated with the feed table 12. They are inclined forwardly, so as to present no material resistance to the feeding of the sheet and yet resist any tendency of the sheet to bounce back from the gauge plates 26 of the front guides. They are so adjusted as to make alignment with the slots 35 of the tongues 15; so as to stiffen the front edge of the sheet, and iron it out, just at that point where it is required to operate upon the leaves 33 of the detector members. This, in connection with the fact that the leaves 33 extend into the slots 35, thereby precluding any change of the edge of the sheet passing beneath the leaves, renders the device entirely certain in its operation, regardless of thinness of the sheet or of any tendency of the latter to curl either downwardly or upwardly.

Extending across the feed table 12 is a rock shaft 46 operated upon by a torsion spring 46a, or some other means tending to rock the same in a clockwise direction, when viewed as in Fig. 2. Such rock shaft has mounted for lateral adjustment thereon a pair of tappet levers 47, one for each of the front guides. These tappet levers have engaging portions 48 which, when the parts are adjusted, stand opposite the heads 40 of the plungers 37. At its outer end, the shaft 46 is provided with a lever 49 having an abutment portion 50 which lies above a vertically reciprocable rod 51. The details of the mechanism actuating, and actuated by, the rod 51 are not of interest here. The rod is reciprocated once for each cycle of the press, thereby, by its engagement with the abutment portion 50, causing the shaft 46 to rock against the action of its spring 46a, and then return. The mechanism, further, is such that when, at a time when a sheet should be presented to the front guides, the spring 46a does not, through the lever 49, exert its pressure downwardly upon the rod 51, the press will either be stopped, or the impression of the press will be thrown off, or both, according to how it is desired to constitute the mechanism. When, however, at that period, pressure of the spring 46a is exerted downwardly on the rod 51, the press will continue to print.

It will be seen that when the sheets are fed correctly, so as to make registering engagement with the gauge plates 26 of the front guides, the detector members will be pushed

forward so that their upper leaves 34 pass out of the slots 41 of the plungers 37. Under these conditions, when the rod 51 descends, the engaging portions 48 of the tappet levers 47 can push the plungers inwardly with respect to the stems 21, and accordingly the shaft 46 can rock clockwise under the action of its spring 46a, the latter exerting a downward thrust upon the rod 51. Under these conditions, the press will continue to print. When, however, a sheet does not reach the gauge plates 26 of the front guides, the detector members 28 will remain in the position shown in Fig. 5, in which the upper leaves 34 lie in the grooves 41 of the plungers 37. In these circumstances, when the rod 51 descends and the spring 46a causes the engaging portions 48 of the tappet levers 47 to push against the heads 40 of the plungers 37, the latter are prevented, by the upper leaves 34, from moving inwardly, and the shaft 46 is thereby held against further rocking movement. Thus the spring 46a cannot exert any downward pressure upon the rod 51. Under these conditions, the press will either be stopped, or its impression will be thrown off, or both, according to how the mechanism is constituted. There are two of the front guides and associated detecting members, either of which functions separately. Therefore if a sheet should be fed properly against the gauge plate 26 of one front guide, but not against the other, the press stoppage, or impression throw off, or both, will occur, as will also take place if a sheet having a portion of its front edge torn away should present itself.

I claim:

The combination with a feed table having a sheet supporting member formed with a slot therein, and a front guide movable into and out of operative position and having a gauge cooperating with said member, of a rock shaft mounted on said table, tripping mechanism associated with said rock shaft to be operated when said shaft is not rocked, an abutment member on said rock shaft, a plunger reciprocally mounted on said front guide for bodily movement therewith, said plunger being disposed for engagement by said abutment member, whereby when said plunger is locked against movement, said rock shaft is prevented from being rocked, said plunger having a groove in the end thereof and a detecting member carried by said front guide and having a portion adapted to enter said slot, whereby said detecting member is moved from one position to another when a sheet is fed against said gauge, said detecting member having a portion adapted to enter said groove, thereby to lock said plunger against movement, when said detecting member is in one of its positions.

In testimony whereof, I sign my name.

ALFRED WILLIAM BARRETT.