

980,825.

T. M. NORTH.
PRINTING MACHINE.
APPLICATION FILED SEPT. 23, 1907.

Patented Jan. 3, 1911.
4 SHEETS—SHEET 1.

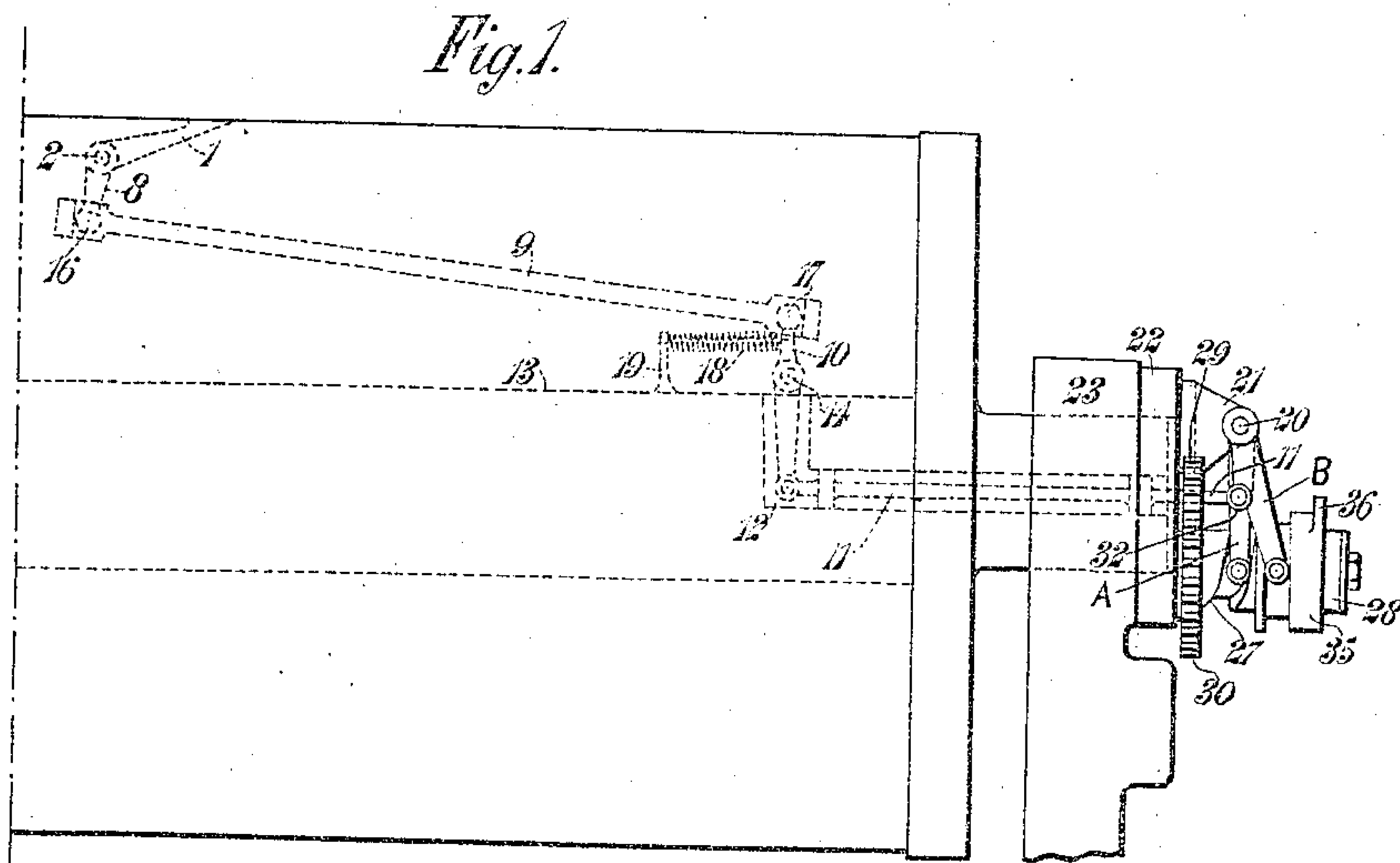


Fig. 5.

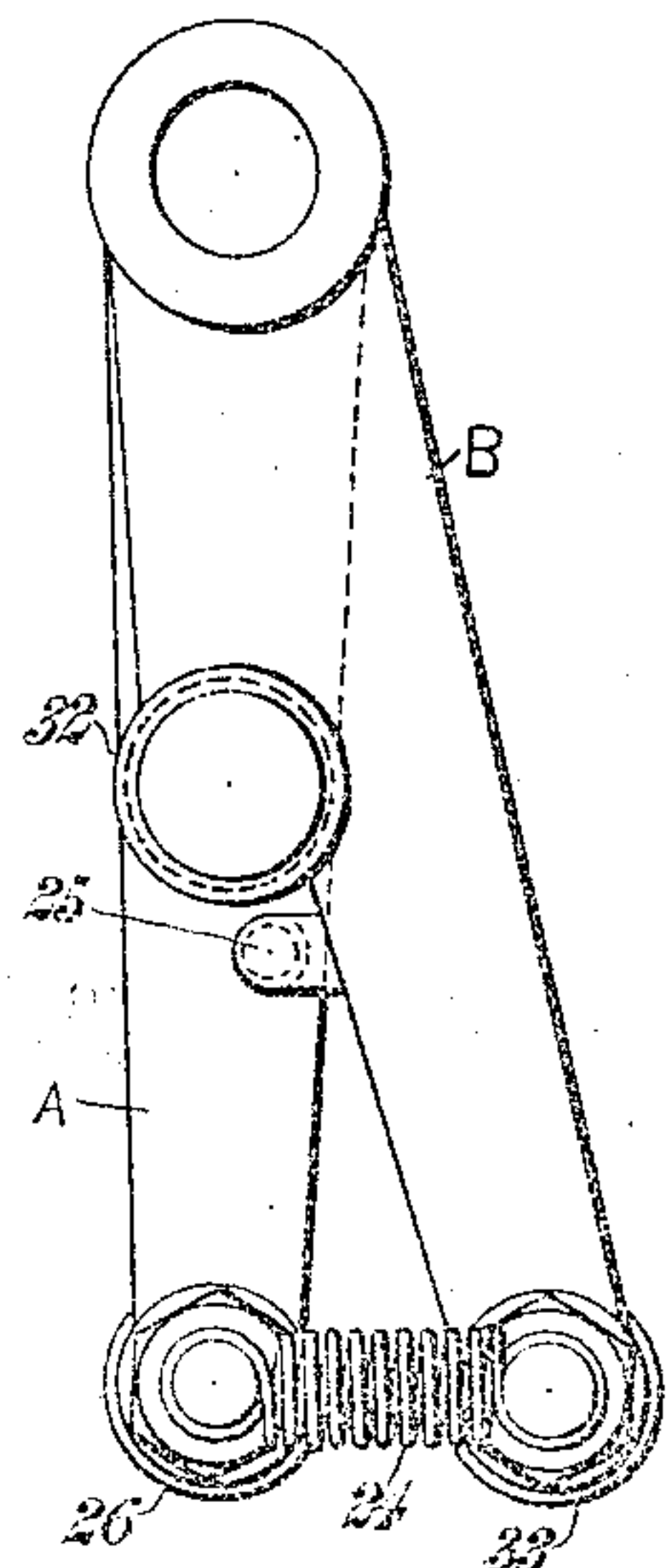
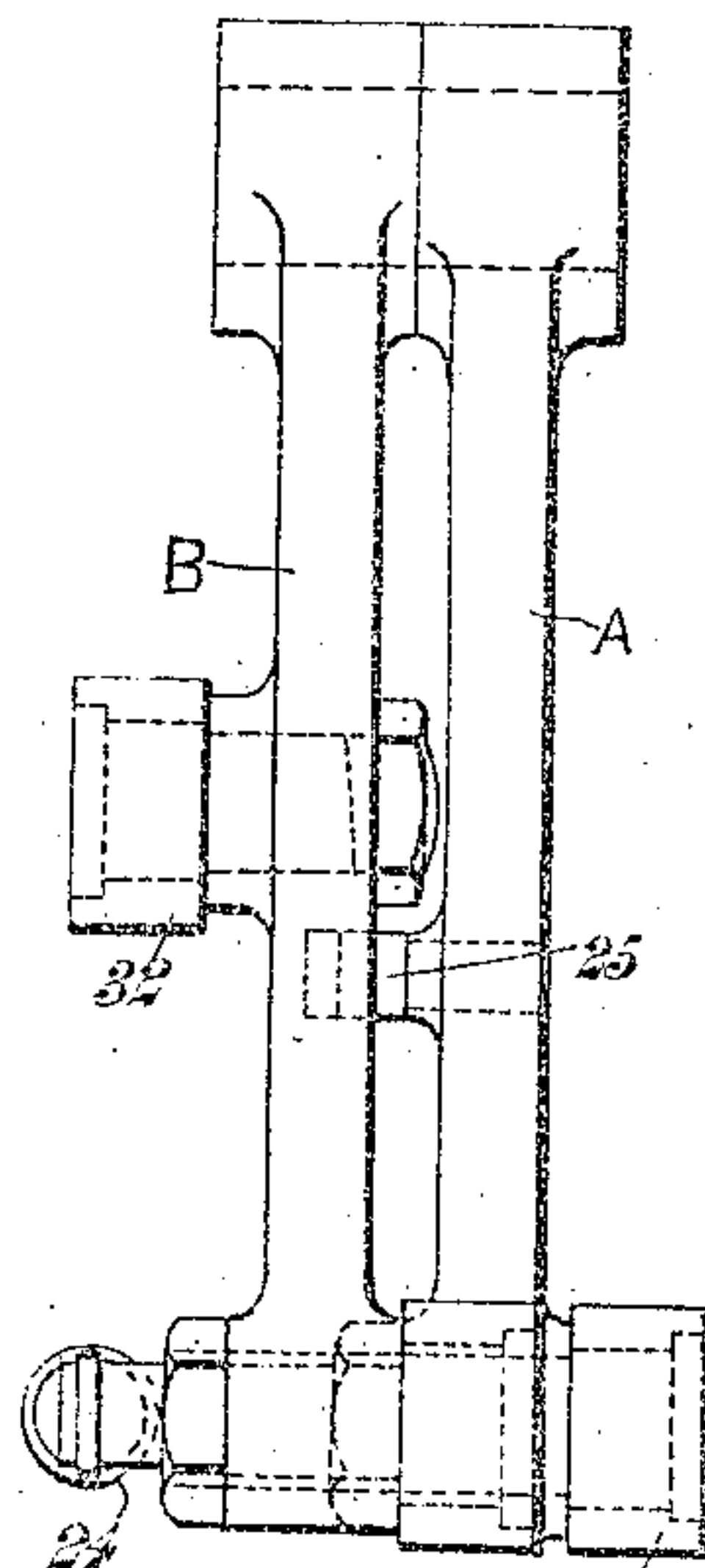


Fig. 6.

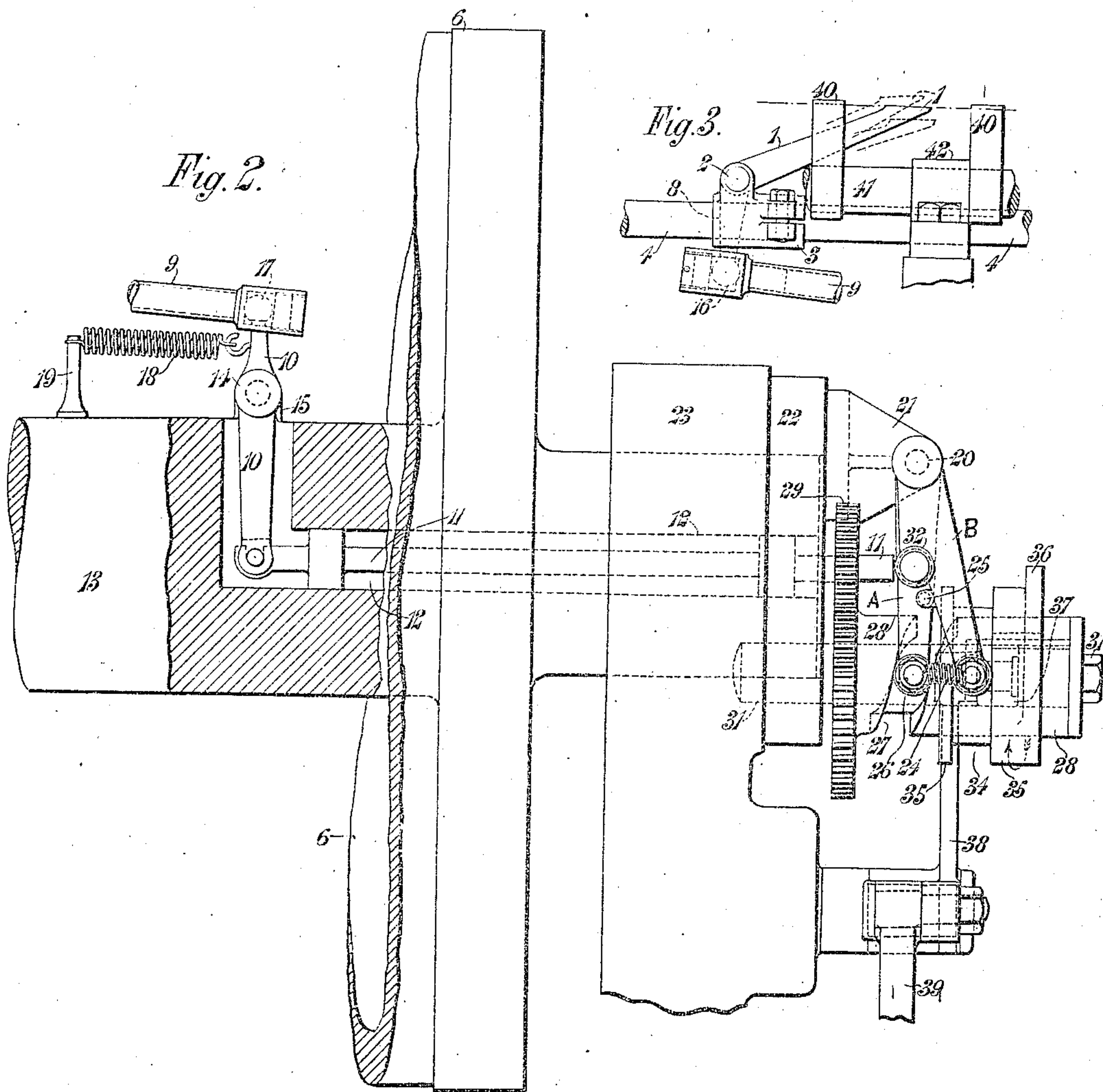


Witnesses
W. Sutherland Robinson
J. J. Blaker.

Thomas Merrifield North
Inventor
per Chas. Woodroffe,
Attorney

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4 SHEETS—SHEET 2.



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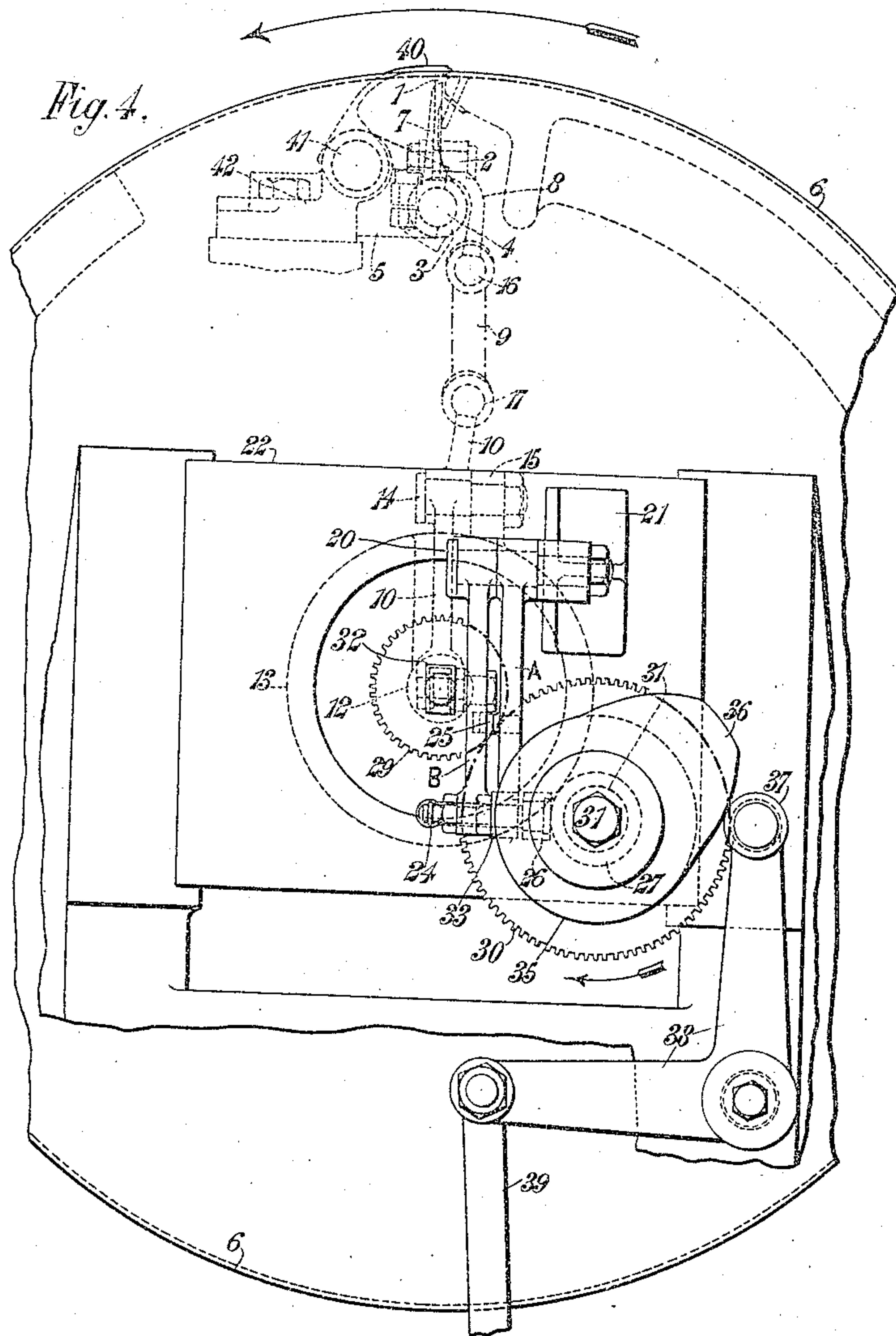
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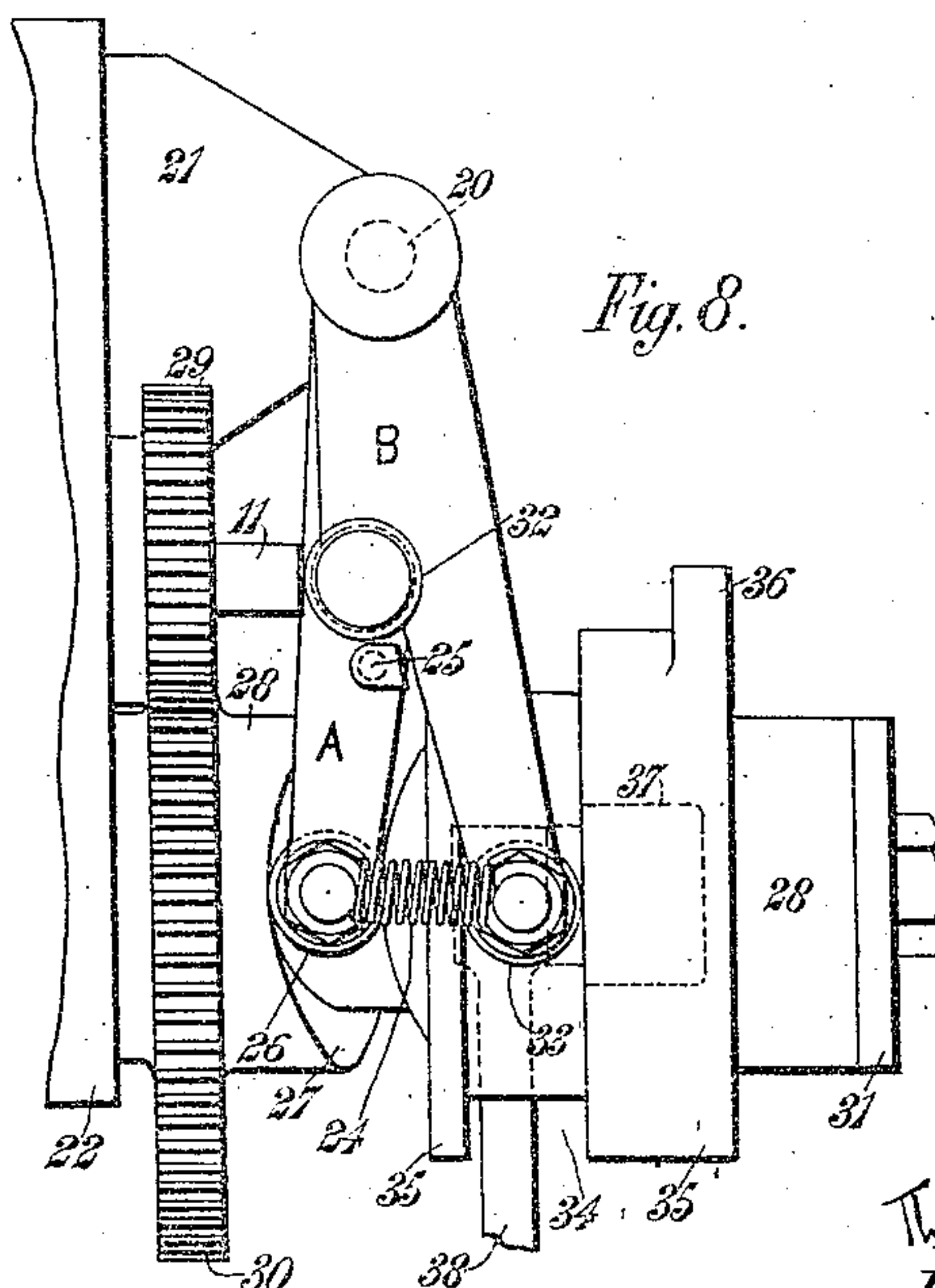
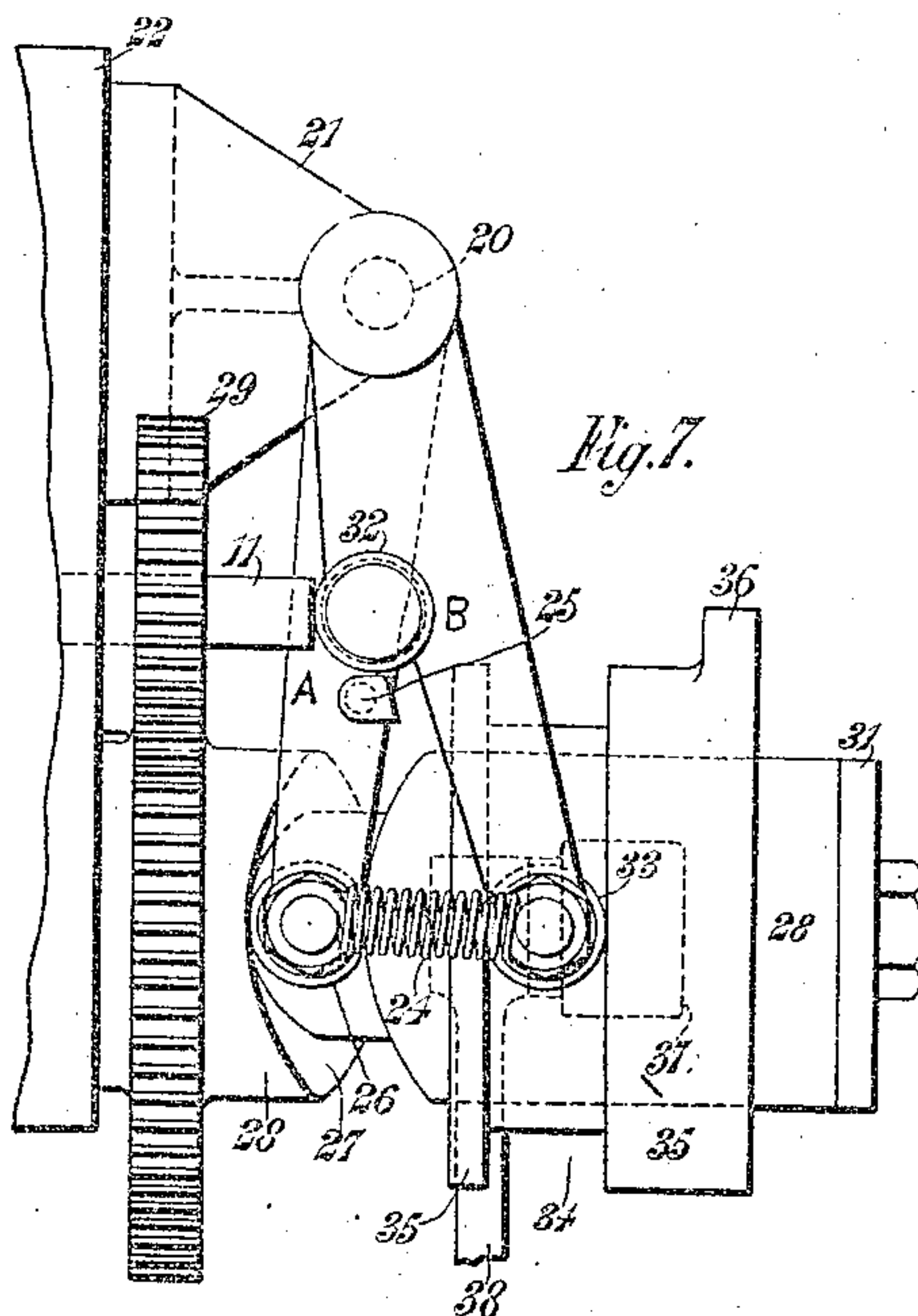
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4 SHEETS—SHEET 4.



Witnesses
D. Sutherland Robinson
J. J. Blaker.

Thomas Merrifield North
Inventor

per Chas. S. Woraroff,
Attorney

UNITED STATES PATENT OFFICE.

THOMAS MERRIFIELD NORTH, OF LONDON, ENGLAND, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE FUCHS & LANG MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PRINTING-MACHINE.

980,825.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed September 23, 1907. Serial No. 394,226.

To all whom it may concern:

Be it known that I, THOMAS MERRIFIELD NORTH, a subject of the King of the United Kingdom of Great Britain and Ireland, residing at 188 and 189 Fleet street, in the city of London, England, have invented new and useful improvements in Printing-Machines, of which the following is a specification.

10 This invention relates to printing machines and has for its object to provide improved mechanism for automatically tripping the impression cylinders where there has been a failure in the supply of sheets thereto. Means have hitherto been devised for attaining this same result, which means have, as in the present invention, contemplated or provided for the use of reciprocating detector fingers or feelers whose amplitude of movement is restricted by the presence of the sheets fed to the machine, but, so far as I am aware, these detector devices have never been arranged to fulfil their function after the impression cylinder grippers have completed, whether successfully or unsuccessfully, their sheet-gripping operation, and consequently it has sometimes happened that the impression cylinder has remained untripped when no sheet has been seized by its grippers, and consequently the impression has been received on the impression cylinder blanket.

15 In accordance with the present invention the before mentioned difficulties are overcome by locating the detector devices in or on the impression cylinder and causing them to fulfil their detecting function immediately after the impression cylinder grippers have fulfilled their sheet gripping function, so that when the said grippers properly secure a sheet, the movement of the detector devices is limited by such sheet to the extent necessary to prevent the operation of the cylinder tripping gear, and when the grippers fail to secure a sheet, the detector devices, having nothing to restrict their motion, move through their full stroke and cause the cylinder tripping gear to operate.

20 In the accompanying drawings which are to be taken as part of this specification and read therewith:—Figure 1 is an elevation showing diagrammatically the general arrangement of the apparatus constructed ac-

cording to the present invention; Fig. 2 is an enlarged elevation shown partly in section, of the said apparatus; Fig. 3 is an elevation constituting in reality a detached portion of Fig. 2, as indicated in Fig. 1; Fig. 4 is an elevation as seen from the right hand end of Fig. 2, and embodying in it also the devices shown in Fig. 3; Figs. 5 and 6 are elevations as viewed in directions at right angles to each other of detached portions of the apparatus shown in Figs. 1 and 2, and Figs. 7 and 8 are elevations generally similar to Fig. 5 but showing the parts in respectively different operative positions.

25 In the preferred arrangement of the apparatus, as shown in the drawings, the above-named detector devices comprise a finger or feeler 1 forming one arm of a lever hereinafter, when specifically mentioned, referred to as the detector lever—pivoted as at 2 to a bracket 3 fast to the usual tympan or blanket-finger shaft 4. This shaft 4, as ordinarily, is mounted in bearings 5 (one of which only is shown in dotted lines in Fig. 4) within the impression cylinder 6 so that it may be adjusted for causing the fingers 7 thereon, to clamp and unclamp the tympan, or, as it is hereinafter called the “blanket”; in Fig. 4 only one of the fingers 7 is shown, but it is to be understood that a plurality of these devices are provided as ordinarily. A second arm 8 of the detector lever 1, is connected by a link 9 to one arm of a second lever 10, whose other arm is pivotally connected to a rod 11 capable of sliding in the direction of its axis within a hole 12 formed concentrically with in the impression cylinder shaft 13. The lever 10 is pivoted on a stud 14 secured in a lug 15 fast to the shaft 13, as shown in Figs. 2 and 4. The link 9 is so connected to the two levers 1 and 10, as for example by the ball and socket joints 16, 17 as to permit of the detector lever 1 moving with the blanket finger shaft 4 when the latter is adjusted for clamping and unclamping the blanket. One end of the sliding or slidable rod 11, as shown best in Fig. 2, projects outward beyond the corresponding end of the impression cylinder shaft 13, and, at any suitable part, a spring 18 is provided which tends to constantly prevent the rod 11 from being pushed into the shaft 13 and move the

feeler finger 1 inward toward the axis of the impression cylinder 6. In the arrangement shown in the drawings, the just-mentioned spring 18 is attached, see Fig. 2, to the outer end of the lever 10 and to a post or stud 19 fast to the shaft 13.

Adjacent to the outwardly projecting end of the slidable rod 11 there are provided two levers A and B, pivoted on the same stud 20 which is secured to a bracket 21 fast to the bearing or journal box 22 vertically slidable, as ordinarily, in the adjacent machine frame 23. The free or vibrating ends of the levers A B are connected together by a tension spring 24 which is sufficiently strong to overcome the influence exerted by the before described spring 18. The lever A carries a stop 25 against which the spring 24 constantly tends to hold the lever B, and it is further provided with a roller 26 which engages with the groove 27 of a cam 28 which, by suitable gearing 29, 30, is continuously rotated once for every two revolutions of the impression cylinder 6; for this latter purpose the pinion 29, which is fast to the impression cylinder shaft 13, has half the number of teeth possessed by the wheel 30 which is fast to the cam 28. The cam 28 with its spur wheel 30 is free to rotate upon a stud shaft 31 rigidly secured to the journal box 22, but it is incapable of moving longitudinally on the said stud shaft.

The lever B, through a roller 32, carried thereon, makes operative contact with the adjacent end of the slidable rod 11, and at its free or vibrating end, it is provided with a roller 33 in permanent engagement with an annular groove 34 formed in the boss or sleeve 35 of an edge cam 36. This cam 36 is "feathered" to the cylindrical portion of the cam 28 so that, although it is compelled to rotate always along with the said cam 28, it is free to slide relatively thereto in the direction of its axis of rotation. The edge cam 36 is formed as an outward or "proud" projection from the otherwise cylindrical boss or sleeve 35 whose outer surface forms a track for an anti-friction roller 37 rotatably mounted on one arm of a bell-crank lever 38 whose other arm, through a link 39 is in operative connection with the ordinary cylinder-trip lever, which latter is not represented in the drawings.

The before described spring 24 is attached to the two levers A and B preferably through the studs by which the rollers 26 and 33 are secured on the said levers, the stud appertaining to the roller 26 being elongated sufficiently to bring its end into line with that of the other of such studs.

40 are the sheet grippers, 41 the rocking gripper shaft on which they are adjustably secured, and 42, Figs. 3 and 4, one of the bearings within the impression cylinder 6, and in which the shaft 41 is capable of be-

ing rocked for causing the grippers 40 to secure and release the sheets, all as ordinarily practiced.

During the normal working of the machine the edge cam 36 is constantly rotated along with the cam 28 and reciprocated in the direction of its axis of rotation on the boss of the said cam. The extent of this reciprocating motion during, be it understood, the normal working of the machine, is not sufficient to move the concentric portion of the boss or sleeve 35 out of operative contact with the roller 37 or to bring the edge cam 36 into a plane in which it can act on the said roller, because, although the lever A constantly tends (through the spring 24) to draw the lever B to its innermost position (in which position it would hold the edge cam 36 in position to operate the lever 11 prevents the lever B from reaching that position, the lever A pursuing the latter part of its inward course alone and the spring 24 meanwhile becoming elongated all as indicated in Fig. 7. When, however, through the failure of the cylinder grippers 40 to secure a sheet on the said cylinder, no resistance is presented to prevent the detector finger 1 from being moved outward through the influence of the spring 24, the rod 11 will be moved inward when and after the roller 32 comes into contact with its outer end and consequently the lever B will also be allowed to move to its innermost position (left-most in Figs. 1, 2 and 5) and thereby bring the cam 36 into operative connection with the cylinder trip gear as will be well understood by reference to Fig. 8.

During the rotation of the impression cylinder 6, immediately following that during which it was tripped, the cam 27 moves the edge cam 36 out of the operative plane of the roller 37 so that the normal condition of working is thereby restored, the impression cylinder 6 remaining in its printing or untripped position until, by the absence of a sheet thereon, it is next caused to be tripped.

It is to be understood that the before described automatic tripping mechanism is or may be supplementary to, and in no way interferes with the operation of, the ordinary tripping mechanism which is controlled by the attendant.

It will be observed that the before-described rod 11 constitutes merely a means of conveying an impulse, or of allowing one to be conveyed to the cylinder tripping mechanism when a sheet is absent from its printing position on the impression cylinder, and that being so, it will be obvious that other means might be employed with equally good results, for example, the detector finger 1 or its mechanical equivalent on the impression cylinder, might serve for completing or interrupting a circuit which by electric or

pneumatic means would cause the cylinder to be tripped.

I claim:—

1. In a printing machine, the combination
5 with an impression cylinder and sheet grippers thereon, of a detector device mounted within said cylinder, means constantly operative upon said detector to normally maintain it out of detecting position, and mechanism intermittently operative upon said detector against the action of said means and
10 timed to operate just after each operation of said grippers.

2. In a printing machine, the combination
15 with an impression cylinder, of a detector device mounted therein, a chamber in and concentric with the shaft of said cylinder, a slider in said chamber, operative connection between one end of said slider and said detector, mechanism adapted to trip said cylinder, and operative connection between the
20 other end of said slider and said mechanism.

3. In a printing machine the combination of an impression cylinder, a detector device
25 mounted thereon and adapted to be projected outward beyond its periphery, a rod operatively connected with the detector device and extending axially through one end of the impression cylinder shaft, a lever
30 acted upon by the rod, and a rotating cam operatively connected with the said lever and adapted to operate the cylinder tripping mechanism.

4. In a printing machine the combination
35 of an impression cylinder, a detector device mounted thereon and adapted to be projected outward beyond its periphery, a rod operatively connected with the detector device and extending axially through one end
40 of the impression cylinder shaft, a lever acted upon by the outwardly projecting end of the rod, a rotating cam operatively connected to the said lever and adapted to be moved by it in the direction of its axis of
45 rotation and to operate the cylinder tripping mechanism, a second lever in spring connection with the first named one, and a cam operatively connected with the second lever and adapted to rock both levers.

5. In a printing machine the combination
0 of an impression cylinder, a detector device mounted thereon and adapted to be projected outward beyond its periphery, a rod operatively connected with the detector de-

vice and extending axially through one end 55 of the impression cylinder shaft, a lever acted upon by the rod, a rotating cam operatively connected to the said lever and adapted to be moved by it in the direction of its axis of rotation and to operate the 60 cylinder tripping mechanism, a second lever in spring connection with the first-named one, a cam operatively connected with the second lever and adapted to rock both levers, and a stop on one of the levers adapted to 65 limit the movement of the said levers relatively to each other.

6. In a printing machine the combination of an impression cylinder, a detector device mounted thereon and adapted to be projected outward beyond its periphery, a rod
70 operatively connected with the detector device and extending axially through one end of the impression cylinder shaft, a lever acted upon by the rod, a rotating cam operatively connected to the said lever and adapted to be moved by it in the direction of its axis of rotation, a second lever in spring connection with the first-named one, a cam operatively connected with the second 80 lever and adapted to rock both levers, a further lever constituting an element of the cylinder tripping mechanism and with which the axially movable cam, when in its normal position, is out of operative relationship and with which lever the last-named cam is brought into operative relationship when the detector device is caused to project beyond the periphery of the impression cylinder. 90

7. An automatic trip mechanism for printing presses comprising, in combination with the impression member of a press and sheet grippers carried thereby, a feeler arranged to engage the inner surface of the 95 margin of a sheet held by the grippers, means acting to move the feeler outwardly in the absence of a sheet from the grippers, and throwout mechanism for throwing the press out of operation, said mechanism being 100 thrown automatically into operation when the feeler moves outwardly.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

THOMAS MERRIFIELD NORTH.

Witnesses:

WARWICK HY WILLIAMS,
T. J. OSMAN.