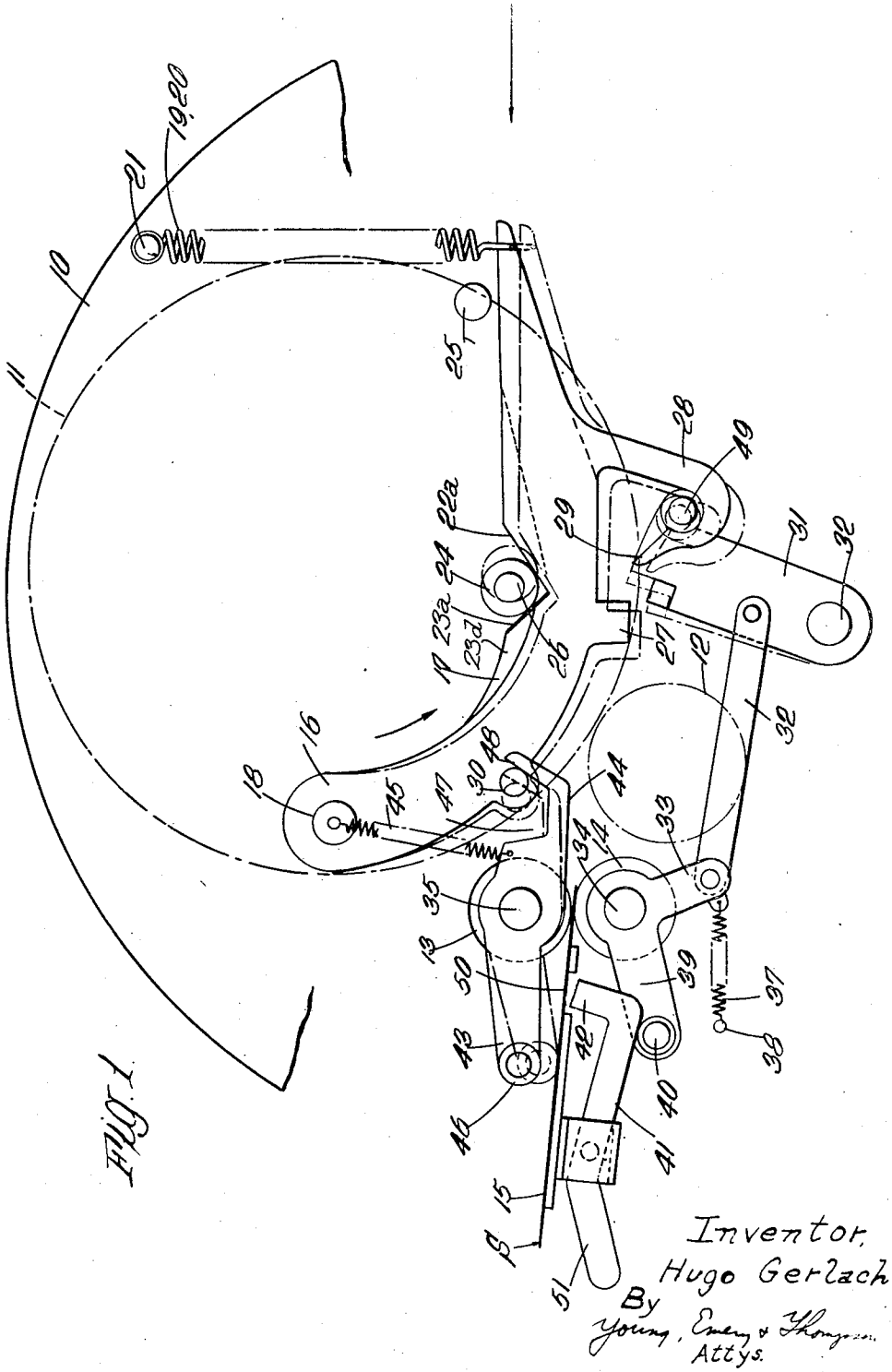
May 22, 1951 H. GERLACH 2,553,911

LOCKING DEVICE IN PRINTING MACHINES

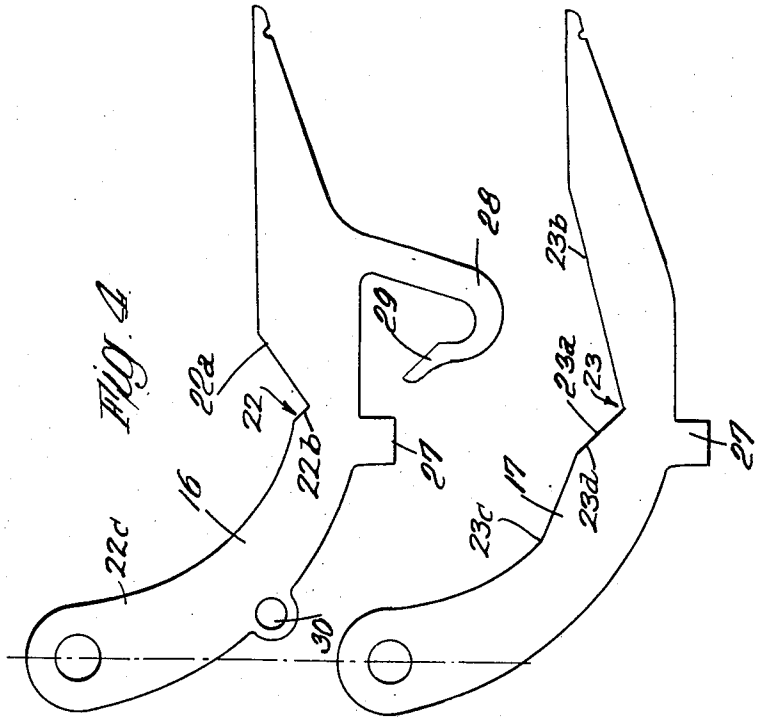
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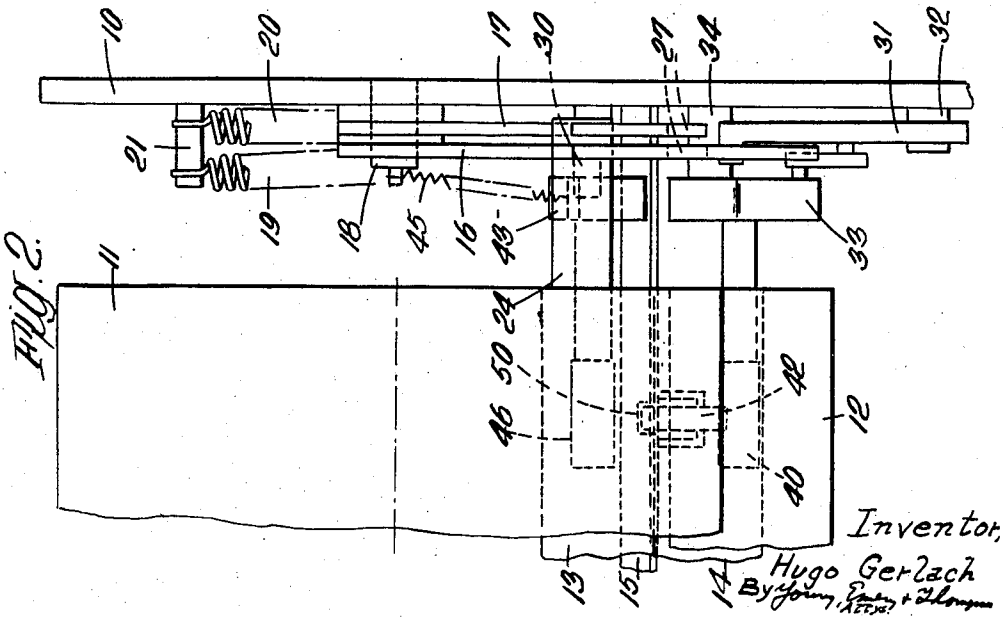


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LOCKING DEVICE IN PRINTING MACHINES

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LOCKING DEVICE IN PRINTING MACHINES

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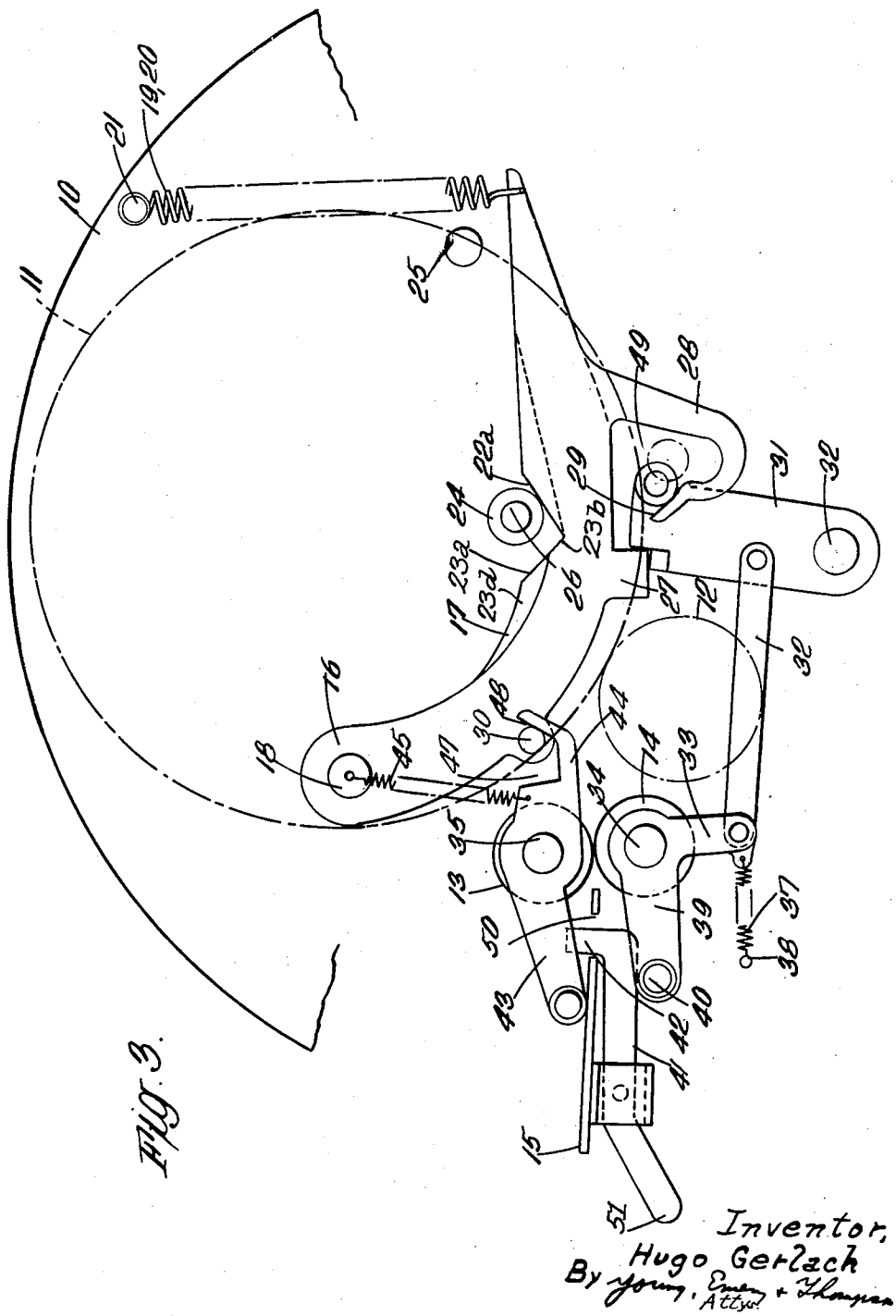


Fig. 3.

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LOCKING DEVICE IN PRINTING MACHINES

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7 Claims. (Cl. 101—233)

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The present invention relates to manually operated printing or duplicating machines embodying a rotatable printing cylinder and is applicable with particular advantage to spirit reproducing machines in which a mirror-script master is mounted upon a printing cylinder or drum and copies are taken on copy material, either in the form of separate sheets or a web passed between the printing cylinder and an associated pressure roller which contacts the printing cylinder or mirror-script master thereon in the absence of a copy sheet. Moistening is effected with a spirit solvent for the hectograph ink upon the mirror-script master to enable the copies to be reproduced, and in such machines it is common practice to supply the spirit solvent to a moistening pad or roller which serves to apply the solvent, and to control the fluid feed by the rotation of the printing cylinder.

It is desirable in such machines to prevent the rotation of the printing cylinder in the absence of a copy sheet or web from the sheet lay or feeding station ready to feed to the printing cylinder, in order to avoid, inter alia, the supply of solvent to the moistening pad in the absence of the sheet to which it should be applied, to prevent offset from the mirror-script master on to the pressure roller which would contact therewith upon rotation of the printing cylinder in the absence of the copy sheet and to prevent sheet-counting mechanism of the kind actuated by rotation of the printing cylinder from registering numbers in excess of copies actually printed.

One object of the present invention is to provide an improved device for preventing any substantial degree of rotation of the printing cylinder in the absence of a copy sheet or web. A particular object is to provide an arrangement which also serves as the cylinder positioning or locating means normally provided for the purpose of marking or indicating to the operator, the correct initial position at which the application of a fresh copy sheet should take place.

A further object of the invention relates to a manually operated printing or duplicating machine embodying a rotating printing cylinder which is provided with a device for preventing any substantial degree of forward rotation of said cylinder in the absence of a copy sheet or web from the sheet feeding station and which comprises a pair of levers yieldingly held in the path of travel of a member carried by the printing cylinder, said levers being provided with complementary recesses which together form a locating notch for receiving said member when the printing cylinder is in its initial sheet feeding position and means adapted to restrain the yielding movement of at least one of said levers in the absence of a copy sheet or web from the sheet feeding station so that movement of said member out of said notch to permit forward movement of said cylinder is prevented.

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In a desired form of the invention said device is also arranged to prevent any substantial degree of cylinder rotation in a backwards or reverse direction.

Preferably said restraining means comprises a movable blocking member which is arranged to be displaceable into and out of the path of yielding movement of said lever or levers. Conveniently, said blocking member is normally held out of the path of said lever or levers and is adapted periodically to be released for movement in such path under the control of a sheet detecting member which operates to hold the blocking member inoperative when a copy sheet is present.

A practical manner of carrying the invention into effect will now be described, by way of example and with reference to the accompanying diagrammatic drawings in which:

Fig. 1 shows in part sectional end elevation the locking mechanism associated with the printing cylinder or drum of a printing or duplicating machine; the mechanism being shown in the inoperative position and the cylinder free to rotate.

Fig. 2 is a fragmentary side elevation of the mechanism shown in Fig. 1.

Fig. 3 is a view similar to Fig. 1, showing the mechanism in the operative or cylinder locking position, and

Fig. 4 shows details of the associated control levers.

Referring to the drawings, 10 indicates one of the two side frames of the machine frame between which the printing couple comprising printing cylinder or drum 11 and pressure or platen roller 12 are mounted. Co-operating upper and lower sheet feed rollers 13 and 14 carried by spindles 35, 34 respectively, and sheet lay table 15 also extend between the side frames 10 and the sheet lay table 15 is disposed so as to direct the sheet between the rolls 13, 14 which feed the leading edge of the sheet into the bite of printing cylinder 11 and pressure roller 12.

The mechanism for carrying the invention into effect comprises a pair of co-operating locking levers 16, 17 which are pivoted upon a trunnion 18 projecting from the inner face of one of the

machine side frames 10. The levers 16, 17 are urged upwards by tension springs 19 and 20 respectively which are secured at one end to the free ends of levers 16, 17 and anchored at their other ends to a pin 21 projecting from the inner face of frame 10; upward movement of the lever 17 is limited by stop 25 extending from frame 10.

The levers 16, 17 are provided with complementary recesses 22, 23 respectively arranged so as to form, when brought together, a V-slot which is adapted to receive a roller 24 mounted upon an axle 26 which projects from the adjacent end of the printing cylinder 11. As shown more particularly in Fig. 4, the recess 22 in lever 16 comprises a major inclined surface 22*a* and a minor oppositely inclined surface 22*b*; the latter leads to an arcuate surface 22*c* extending to the end which receives the trunnion pin 18. The recess 23 in lever 17 comprises an inclined surface 23*a*, normally lying flush with the surface 22*b* of lever 16, and an extended oppositely inclined surface 23*b* leading towards the free end of the lever. The surface 23*a* is approached, in a direction from the end receiving trunnion pin 18, by a further oppositely inclined surface 23*c* forming a proud region 23*d*. Each of the levers 16 and 17 is provided with a lug 27, while lever 16 is also provided with a cam slotted hook 28 with an extended lip 29, and a laterally projecting locking pin 30.

A blocking lever 31 is mounted upon a pivot pin 32 projecting inwards from the side frame 10 and is formed at its free end with a shouldered portion which is adapted to engage the lugs 27 when lever 31 is suitably disposed as hereinafter described. A pin 49 projects laterally from member 31 for engagement by the hook 28. Lever 31 is connected by an articulated link 32 to one arm 33 of a bell crank which is mounted upon the end of the feed roll spindle 34, and a tension spring 37 is connected at one end to the linked arm 33 of the bell crank and anchored at its further end by a pin 38 fixed to frame member 10. The second arm 39 of the bell crank is provided at its free end with a roller 40 and projects beneath the sheet lay table 15 so that roller 40 lies in the path of movement of a sheet detector 41 which is pivotally secured to the underside of the table 15. The free end of the member 41 is cranked to form a sheet engaging finger 42 which is arranged to project through a slot 50 in the sheet lay table 15 in the absence of a copy sheet from the table. A two arm lever 43, 44 is freely mounted upon feed roll spindle 35 and arm 44 thereof is connected to one end of a tension spring 45, the further end of the latter being anchored to the fixed trunnion 18. Arm 43 of the two arm lever carries a wide roller 46 which is disposed above the sheet lay table 15, and arm 44 is formed with a recess 47 having an inclined lateral face 48 adapted for engagement with pin 30.

The operation of the above described constructional form of the invention is as follows:

For purposes of illustration, it may be assumed that the mechanism is in the position shown in Fig. 1, i. e. the initial feeding position, with a copy sheet S upon sheet lay table 15. At this position the cylinder 11 is appropriately located by the presence of the roller member 24 carried thereby within the V-shaped notch formed in the levers 16, 17. When the operating handle of the machine (not shown) is turned to rotate printing cylinder 11 in the forward or operative, i. e., anti-clockwise direction, roller 24 will move from the

full line position to the chain-dot position and in so moving will depress levers 16, 17 to the chain-dot position, and pin 30 will move to permit the two arm lever 43, 44 to rock in anti-clockwise direction so that roller 46 bears upon copy sheet S as the leading edge of the sheet moves into the bite of feed rolls 13, 14. When in this position i. e. correctly registered ready for feeding between cylinder 11 and roller 12, the sheet S is firmly held down upon table 15 so as to cover gap 50 and therefore prevents finger 42 from rising through the gap. At the same time hook 28 carried by lever 16 has moved downwards and pin 49 is freed to move out of the hook and commences to travel along the lip 29 thus to release blocking member 31 for movement under the influence of spring 37. The depressed sheet detector member 41, however, lies in the path of roller 40 on the bell crank arm 39 and so holds the bell crank, with its connecting link 32 and blocking member 31, in the dotted line position (Fig. 1). Roller 24 is therefore permitted further to depress lever 16 and so move from recess 22 and the cylinder 11 is left free to perform an operative revolution. During this movement the lever will again be raised by spring 19 to the full line position. At the same time the lip 29 of hook 28 will engage pin 49 and, by cam action, restore the blocking member 31 to the full line position (Fig. 1). Then, towards the completion of the revolution, roller 24 will depress, first lever 17 by contact with proud region 23*d* and then also lever 16 before entering the V-recess as shown.

The purpose of this depression of lever 17 is to cause the lowering of its lug 27 to a position in front of the shouldered portion of the blocking lever 31 whereby the momentary release of the latter by the subsequent depression of lever 16 as the roller 24 nears the completion of its revolution, does not set up a blocking action similar to that described below due to the fact that the sheet S is no longer present at the vicinity of the sheet detector 41.

In the absence of a sheet from the lay table 15, the sheet detector 41 is left free to rise with the finger 42 passing through gap 50 in the table and so the blocking lever 31 and associated mechanism is drawn by spring 37 into the position shown in Fig. 3 when roller 24 and levers 16, 17 are located as shown. Lever 16 is then restrained from further yielding movement by means of blocking lever 31; roller 24 is thus locked in the V-notch formed by recesses 22, 23 so that cylinder 11 is prevented from turning before any substantial degree of forward movement has been effected. A similar action takes place when the cylinder 11 is turned backwards, the movement of roller 24 out of the depression 22 of lever 16 causing the release of the blocking member 31 to a position similar to that shown in Fig. 3, where it restrains the further depression of the second lever 17 which would occur upon further reverse rotation of the cylinder 11, due to the passage of roller 24 up the surface 23*a* of such lever 17. A resetting handle 51 may be provided, if desired, for depressing the detector 41, 42 by hand when it is desired to feed another copy sheet to the lay table or to permit the printing cylinder to be rotated in the absence of a sheet, e. g., when the machine is being serviced.

The invention is not restricted to the above described constructional embodiment and equivalent mechanical devices and arrangements for carrying the invention into effect may readily

be devised within the ambit of the appended claims.

I claim:

1. In a manually operable printing machine having a machine frame, a rotatable printing cylinder, means for feeding copy material to said printing cylinder and a feeding station for directing a supply of copy material to said feeding means, the provision of a device for preventing any substantial degree of rotational movement of said printing cylinder away from the proper starting position for each operative printing revolution thereof in the absence of copy material from said feeding station comprising an abutment member carried by said printing cylinder in offset relation to its axis, a pair of levers pivotally mounted on said machine frame and yieldingly held in the path of said abutment member, recesses in each of said levers shaped so as to form, together, a locating notch for receiving said abutment member when said printing cylinder is in said starting position, means for testing for the presence of copy material at said feeding station, a blocking member movable into and out of the path of yielding movement of at least one of said levers, means for normally holding said blocking member out of the path of yielding lever movement and for periodically releasing said blocking member to permit movement thereof into said path of lever movement, at the instant of initial forward movement of said printing cylinder away from said starting position and means operated by said testing means for controlling the position of said blocking member when released so that it is moved into the path of lever movement in the detected absence of copy material and held out of said path of lever movement in the detected presence of copy material by said testing means.

2. A manually operable printing machine in accordance with claim 1 wherein said means by which the blocking member is normally held and is periodically released is controlled by one of said pair of levers.

3. A manually operable printing machine in accordance with claim 2 wherein said means by which the blocking member is normally held and is periodically released comprises a hook-shaped extension of one of said levers shaped for engagement with a projecting abutment upon said blocking member.

4. A manually operable printing machine in accordance with claim 3 wherein said hook-shaped extension is provided with a cammed lip for engagement with said projecting abutment on said blocking member for restoring the latter to its normal position out of the path of lever movement.

5. In a manually operable printing machine having a machine frame, a rotatable printing cylinder, means for feeding copy material to said printing cylinder and a feeding station for directing a supply of copy material to said feeding means, the provision of a device for preventing any substantial degree of rotational movement of said printing cylinder away from the proper starting position for each operative printing revolution thereof in the absence of copy material from said feeding station comprising an abutment member carried by said printing cylinder in off-set relation to its axis, a pair of levers pivotally mounted on said machine frame and yieldingly held in the path of said abutment member, recesses in each of said levers shaped so as to form, together, a locating notch for receiving said abutment member when said printing cylinder is in said starting position, means for testing for the presence of copy material at said feeding station, a blocking member movable into and out of the path of yielding movement of each of said levers, means which normally operate to hold said blocking member out of the path of yielding movement of said levers and which are periodically released for control by said testing means at the instant of initial movement of said printing cylinder in either direction away from said starting position and means operated by said testing means for controlling the position of said blocking member so that it is moved in to the path of yielding movement of each of said levers in the detected absence of copy material whereby movement of said abutment member out of said locating notch to permit movement of the printing cylinder in either direction is prevented.

6. In a manually operable printing machine having a machine frame, a rotatable printing cylinder, means for feeding copy material to said printing cylinder and a feeding station for directing a supply of copy material to said feeding means, the provision of a device for preventing any substantial degree of rotational movement of said printing cylinder away from the proper starting position for each operative printing revolution thereof in the absence of copy material from said feeding station comprising an abutment member carried by said printing cylinder in off-set relation to its axis, a pair of levers pivotally mounted on said machine frame and yieldingly held in the path of said abutment member, recesses in each of said levers shaped so as to form, together, a locating notch for receiving said abutment member when said printing cylinder is in said starting position, means for testing for the presence of copy material at said feeding station and comprising a movable testing member normally located clear of the path of travel of said copy material to said feeding means and mechanism for periodically moving said testing member into a position to test for the presence of copy material, said latter mechanism being arranged for operation by the initial movement of said printing cylinder in either direction away from said starting position, a blocking member movable into and out of the path of yielding movement of each of said levers and means operated by said testing means for controlling the position of said blocking member so that it is moved in to the path of yielding movement of each of said levers in the detected absence of copy material whereby movement of said abutment member out of said locating notch to permit movement of the printing cylinder in either direction is prevented.

7. In a manually operable printing machine having a machine frame, a rotatable printing cylinder, means for feeding copy material to said printing cylinder and a feeding station for directing a supply of copy material to said feeding means, the provision of a device for preventing any substantial degree of rotational movement of said printing cylinder away from the proper starting position for each operative printing revolution thereof in the absence of copy material from said feeding station comprising an abutment member carried by said printing cylinder in off-set relation to its axis, a pair of levers pivotally mounted on said machine frame and yieldingly held in the path of said abutment member, recesses in each of said

levers shaped so as to form, together, a locating notch for receiving said abutment member when said printing cylinder is in said starting position, means for testing for the presence of copy material at said feeding station said testing means comprising a movable testing member normally located clear of the path of travel of said copy material to said feeding means and means for periodically moving said testing member into a position to test for the presence of copy material, said latter means being arranged for operation by the initial movement of said printing cylinder in either direction away from said starting position, said testing means including a further member for engaging and holding said copy material during testing movement of said movable testing member, a blocking member movable into and out of the path of yielding movement of each of said levers and means operated by said testing means for controlling the position of said blocking member

so that it is moved in to the path of yielding movement of each of said levers in the detected absence of copy material whereby movement of said abutment member out of said locating notch to permit movement of the printing cylinder in either direction is prevented.

HUGO GERLACH.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,616,922	Ramdor	Feb. 8, 1927
1,658,139	Osborne	Feb. 7, 1928
2,358,401	Knauer	Dec. 1, 1936

FOREIGN PATENTS

Number	Country	Date
253,283	Great Britain	June 17, 1926