

(No Model.)

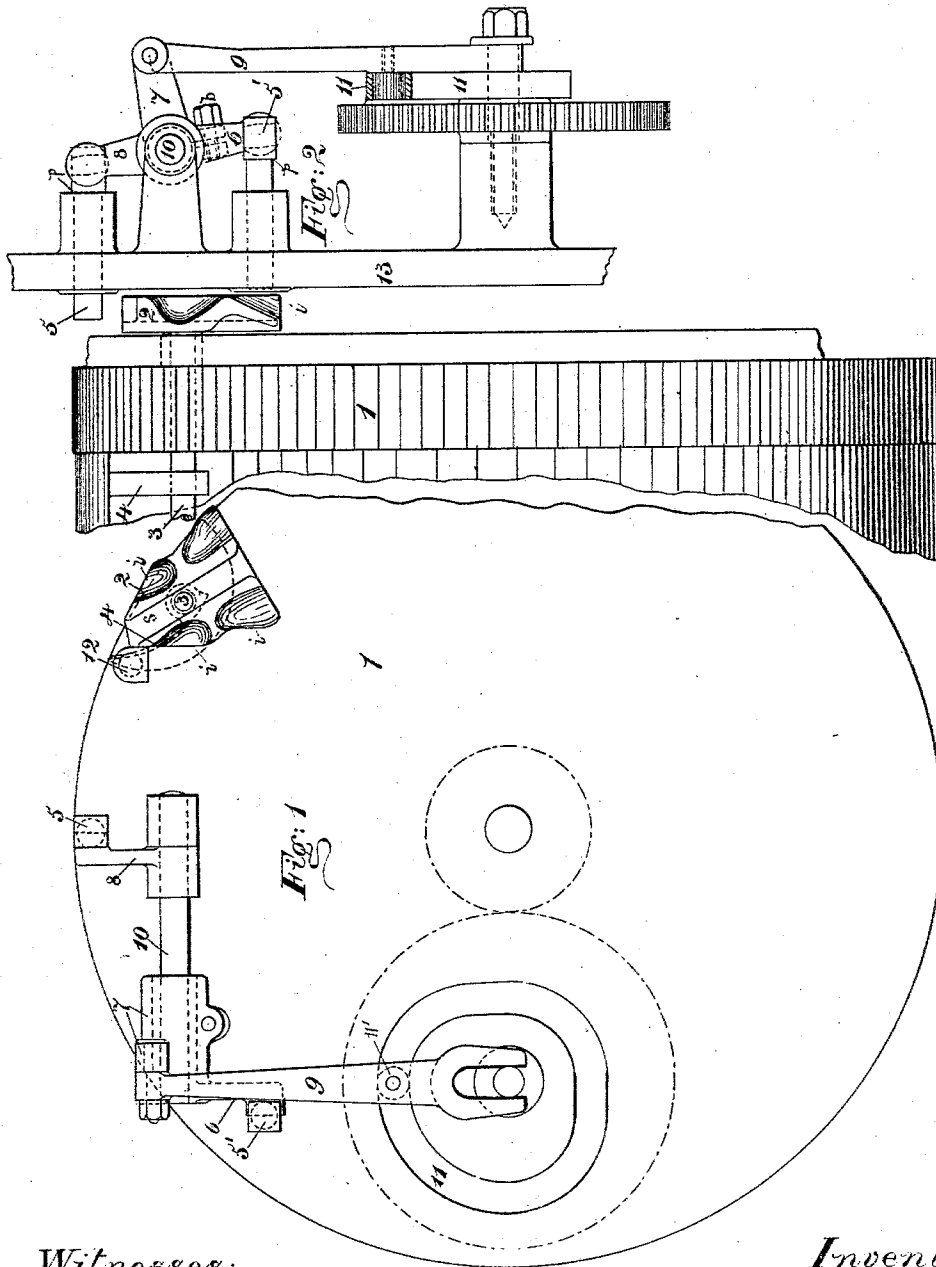
4 Sheets—Sheet 1.

W. B. YATES & W. S. HUSON.

OPERATING GRIPPER TUMBLER CAMS IN PRINTING PRESSES.

No. 561,640.

Patented June 9, 1896.



Witnesses:
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by R. M. Downes
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Fig: 5.

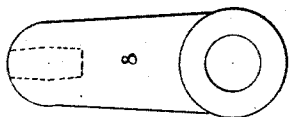


Fig: 3.

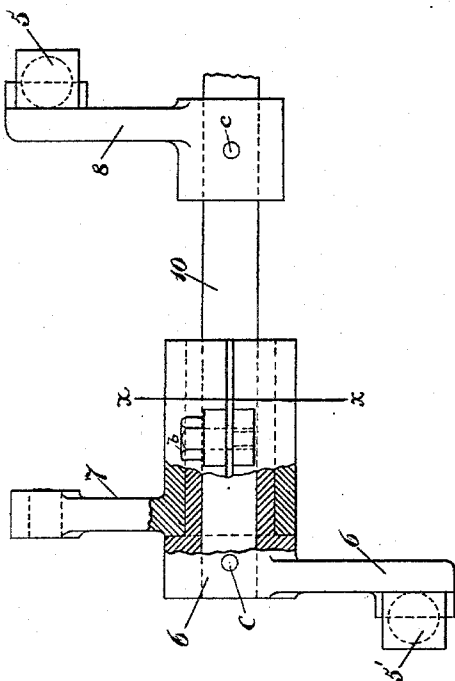


Fig: 4.

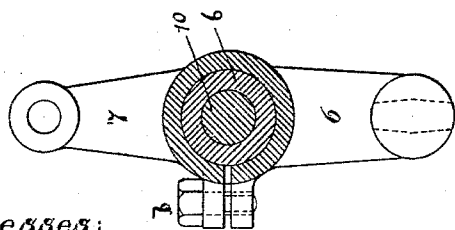
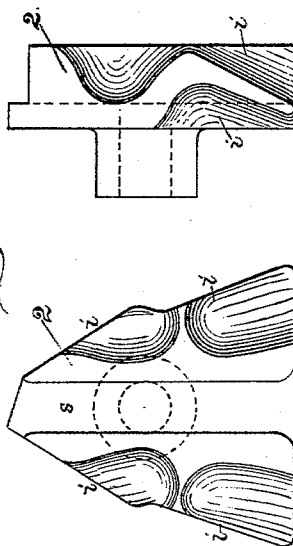


Fig: 6.



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(No Model.)

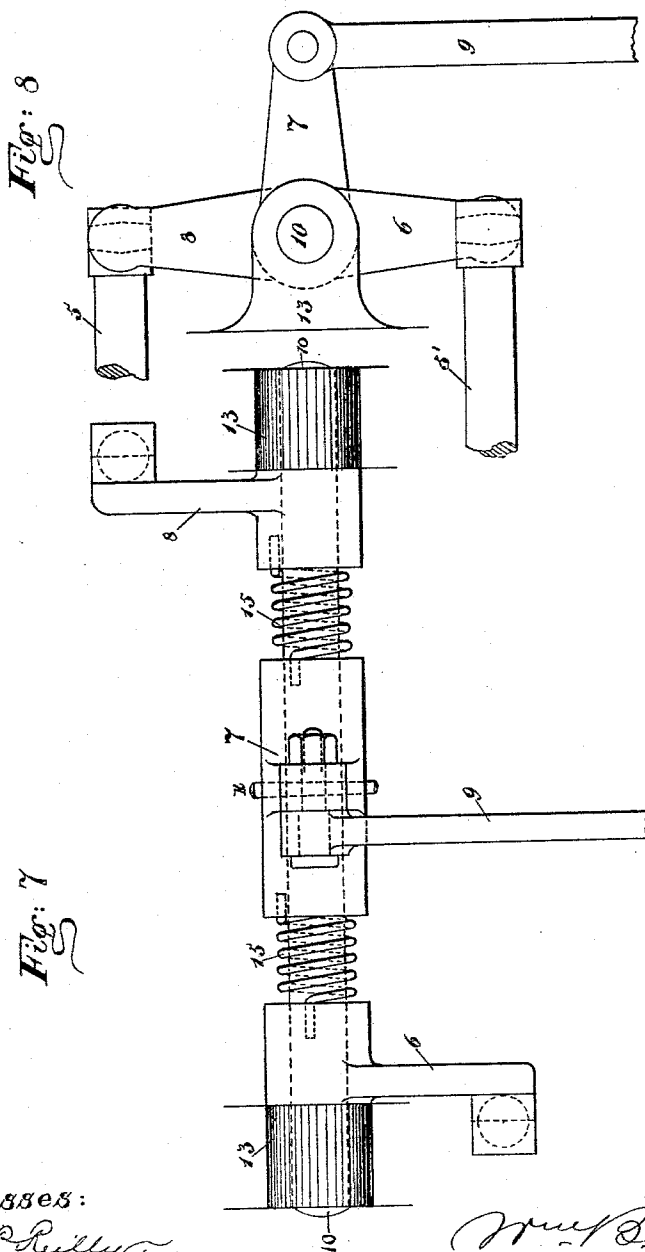
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OPERATING GRIPPER TUMBLER CAMS IN PRINTING PRESSES.

No. 561,640.

Patented June 9, 1896.



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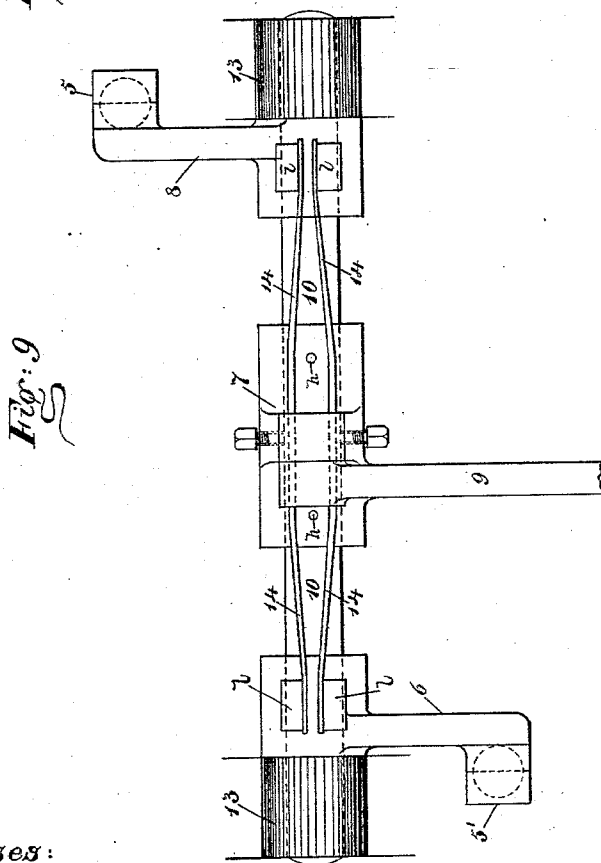
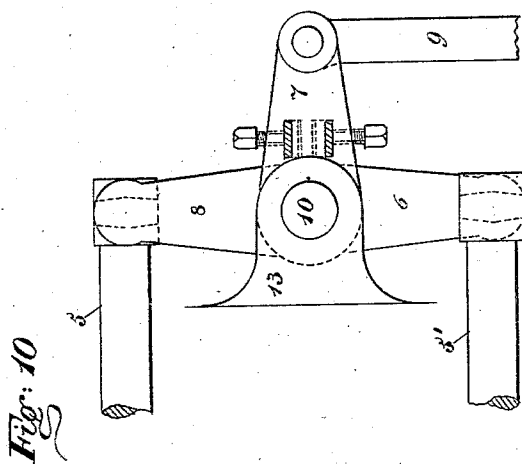
4 Sheets—Sheet 4.

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OPERATING GRIPPER TUMBLER CAMS IN PRINTING PRESSES.

No. 561,640.

Patented June 9, 1896.



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UNITED STATES PATENT OFFICE.

WILLIAM B. YATES AND WINFIELD S. HUSON, OF TAUNTON, MASSACHUSETTS,
ASSIGNORS TO THE CAMPBELL PRINTING PRESS AND MANUFACTURING
COMPANY, OF NEW YORK, N. Y.

OPERATING GRIPPER TUMBLER-CAMS IN PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 561,640, dated June 9, 1896.

Application filed November 12, 1890. Serial No. 371,263. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM B. YATES and WINFIELD S. HUSON, citizens of the United States, and residents of Taunton, in the county of Bristol and State of Massachusetts, have jointly invented a new and useful Improvement in Operating Gripper Tumbler-Cams in Printing-Presses, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

This invention is in particular applicable to that class of printing-presses in which the cylinder is continuously rotating when in operation, and on which cylinder the sheet to be printed is taken and held by grippers secured to a gripper-shaft journaled in said cylinder and operated by a tumbler-cam secured to said gripper-shaft. Upon one of the ends of said gripper-shaft is secured a slotted tumbler-cam, which, by the revolution of the cylinder in conjunction with studs suitably located, oscillates said shaft to open and close the grippers secured thereto.

The object of this invention is to prevent injury to the gripper mechanism should the tumbler-cam fail to properly engage the studs above mentioned.

The invention will first be described in detail, and then particularly set forth in the claims.

In the accompanying drawings, Figure 1 shows in outline an end view of the cylinder of a printing-machine, partly broken away, in connection with the gripper mechanism hereinafter described. Fig. 2 is a side elevation of one end of the cylinder, showing the gripper mechanism in similar elevation with part of said mechanism secured to a portion of the framework of the machine. Fig. 3 shows in side elevation, partly in section, a part of the operating mechanism for the gripper opening and closing studs detached. Fig. 4 is an end view of a part of Fig. 3, taken through the section-line *x x*, looking to the left. Fig. 5 is an elevation of the arm marked 8 in Fig. 3, looking to the right, detached. Fig. 6 shows, detached, in front and side elevation, respectively, the gripper tumbler-cam hereinafter described. Fig. 7 is a front elevation of a modified form of stud-operating

mechanism, detached, hereinafter described. Fig. 8 is an end elevation of the parts shown in Fig. 7. Fig. 9 shows in front elevation another modification of the stud-operating mechanism, detached, hereinafter described. Fig. 10 is an end elevation of the parts shown in Fig. 9.

In said figures the several parts are respectively indicated by reference numbers and letters, as follows:

The numeral 1 indicates the cylinder of a printing-machine partly broken away to exhibit such portions only as are required to illustrate the invention; 2, a gripper tumbler-cam; 3, an oscillating gripper-shaft journaled in suitable bearings in cylinder 1, upon which said cam is secured; 4, one of the sheet-grippers mounted on said shaft 3; 5, a stud mounted in the frame of the machine, operating as hereinafter described, for closing the grippers, and 5 a stud, operating as hereinafter described, for opening the grippers.

The numerals 6, 7, and 8 indicate arms mounted on a rock-shaft 10, as hereinafter described. To the arm 7 is articulated at one end a cam-rod 9, whose opposite end is forked, spanning a shaft on which is mounted a box-cam provided with a groove 11, in which groove a roller 11', journaled in the side of the rod 9, travels. The tumbler-cam 2 is provided with a central slot *s* and with inclined planes *i* upon its outer side.

The numeral 12 indicates a stop for the gripper tumbler-cam secured in the cylinder 1, Fig. 1, and 13 a supporting side frame or bracket in which the opening and closing studs 5' 5 are carried and to which their operating mechanism, hereinbefore described, is secured.

The arm 7, Figs. 1, 2, 3, and 4, is mounted upon the hub of arm 6 and secured thereon by frictional contact only, its hub being split and clamped over the hub of arm 6 by a clamp-bolt *b*. The arms 6 and 8 are rigidly secured to the rock-shaft 10 by pins through holes *c* or otherwise, Fig. 3.

Referring to Figs. 7, 8, 9, and 10, the arm 7, Fig. 9, is rigidly secured to rock-shaft 10 by pins in holes *h* or otherwise, and the arms 6 and 8 are loosely mounted on said rock-

shaft, the flat springs 14, whose ends are held between lugs *l* on said arms, permitting said arms to yield or move a certain distance around the rock-shaft 10 as a center. Said springs are bolted to a lug of arm 7, suitably located. The coiled springs 15, Fig. 7, surrounding the rock-shaft 10, perform the same office as the flat springs 14, (shown in Fig. 9,) the ends of said coiled springs being inserted in holes in the hubs of the arms 6 7 8 and the hub of the arm 7 being pinned fast to the rock-shaft 10 by the pin *k*.

The operation of the invention is as follows: In the ordinary operation of the machine as the cylinder 1 rotates, through the operation of the cam 11, its rod 9, and arm 7, the rock-shaft 10 is caused to rock or oscillate, so as to alternately protrude and withdraw the studs 5 5', connected, respectively, to the arms 8 and 6 of said rock-shaft. The several movements of the parts are so timed that when the stud 5' is protruded the cylinder 1 has brought the tumbler-cam 2 in such position that said stud, as the cylinder continues to rotate, enters said slot and thereby imparts an oscillating movement to said cam upon its central point—the gripper-shaft 3, to which it is secured—which oscillation, being imparted to said shaft, opens the grippers 4, secured thereon. At the proper time for closing said grippers the action of the cam 11, through the parts described, withdraws the stud 5' and protrudes the stud 5, which in like manner engaging the slot *s* in the cam 2 closes the grippers by oscillating the cam in the opposite direction. So far this mere action and the parts effecting that action do not differ from what is already known and practiced in the art; but should the tumbler-cam 2 be accidentally thrown out of its proper position or if for any reason should meet either one of the studs 5 5' at the wrong time breakage of some part of the mechanism would almost certainly take place, due to the momentum of the revolving cylinder 1. In order to prevent such breakage or liability of breakage, the tumbler-cam 2 is provided with the inclined planes *i* hereinbefore described, and the arms 6, 7, and 8 are mounted upon the rock-shaft 10, so as to yield or rotate upon said rock-shaft, as hereinbefore described. The effect of this construction of cam and rock-shaft arms is as follows: The slight power required to overcome the friction of the moving parts in reciprocating the studs 5 5' by the cam 11 is not sufficient to turn the arms 6 7 8 independently of the rock-shaft 10, and said arms when moved by said cam act as if rigidly secured to the rock-shaft 10; but should the tumbler-cam 2 in its travel meet either one of the studs 5 5' at the wrong time one of its inclined planes *i* will strike said stud on its end and, by reason of its inclination, force said stud backward out of its way. Such stud in yielding to the cam moves either the arm 6 or 8, as the case may be, with it. If said arms be secured rigidly to the

rock-shaft 10, as shown in Figs. 1 to 4, inclusive, said rock-shaft will turn backward within the eye of the hub of the arm 7, said arm being only frictionally clamped upon the hub of the arm 6, as hereinbefore described, the rod 9 and the cam 11 not opposing such movement of the rock-shaft 10; but if the arm 7 be rigidly secured to the rock-shaft 10, as shown in Figs. 7 to 10, inclusive, then either the arm 6 or 8 will turn upon the rock-shaft 10 when the stud 5 or 5', as the case may be, is pushed backward by one of the inclined planes *i* of the cam 2, the rock-shaft 10 remaining unmoved by such yielding of the arm 6 or 8. All danger of breakage of the parts is thus provided for by automatic means.

It is obvious that, if preferred, the arm 7 instead of being rigidly secured to the rock-shaft 10, when used in conjunction with springs for the arms 6 and 8, may be simply secured by a friction-clamp, as shown in Figs. 1 to 4, inclusive, the degree of friction being easily regulated by said clamp so that said arm may be capable of yielding under severe strain instead of being absolutely fixed and unyielding.

If the arms 6 and 8 are fitted with springs, as described, the reactive force of said springs will always keep said arms set at their proper angle on the rock-shaft 10, so that the studs 5 5' will always be protruded the proper distance to engage the tumbler-cam 2; but if the arm 7 be frictionally secured instead of rigidly fixed to the rock-shaft 10 it is obvious that if said rock-shaft be once turned independently of said arm by the backward movement of either of the studs 5 5' the normal angle of said arm thereon must be restored or the studs 5 5' may not be protruded so as to properly engage the tumbler-cam 2. The one stud might be protruded too far and the other not far enough. This result is obviated by the shoulders *p* on said studs, which, either one, coming in contact with the side of the boss in which it is carried on the frame 13, will prevent the stud from being pushed too far in, and the pressure of said shoulder against the boss, if continued, will rotate the rock-shaft 10 independently of the arm 7 far enough to the point where the arm 7 will stand at its normal angle to the arms 6 and 8 thereon. Thus the whole object of the invention is automatically effected in preventing all danger of breaking any part of the gripper-operating apparatus.

Having thus fully described our said invention, we claim—

1. In a cylinder printing-press, a gripper tumbler-cam provided with safety-inclines, in combination with sliding studs, mechanism for operating said studs, and a yielding connection between the studs and the operating mechanism, substantially as described.

2. In a cylinder printing-press, a gripper tumbler-cam provided with safety-inclines, in combination with sliding studs, a rock-shaft

provided with arms for operating said studs, means for operating said rock-shaft, and a yielding connection between the rock-shaft and its operating mechanism, substantially as described.

3. In a cylinder printing-press, the combination of a gripper tumbler-cam provided with safety-inclines, sliding studs, a rock-shaft having rocker-arms connected to the sliding studs, an arm yieldingly connected to operate the rock-shaft, and means for operating this arm, substantially as described.

4. In a cylinder printing-press, a gripper tumbler-cam provided with inclined planes, in combination with sliding studs, means for operating the same, and yielding rocker-arms, each of said studs being provided with a stop or shoulder connecting it to one of said arms, substantially as described.

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