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H. F. BECHMAN.
THROW-OFF MECHANISM FOR PRINTING MACHINERY.
APPLICATION FILED MAY 29, 1907.

Fig. 1.

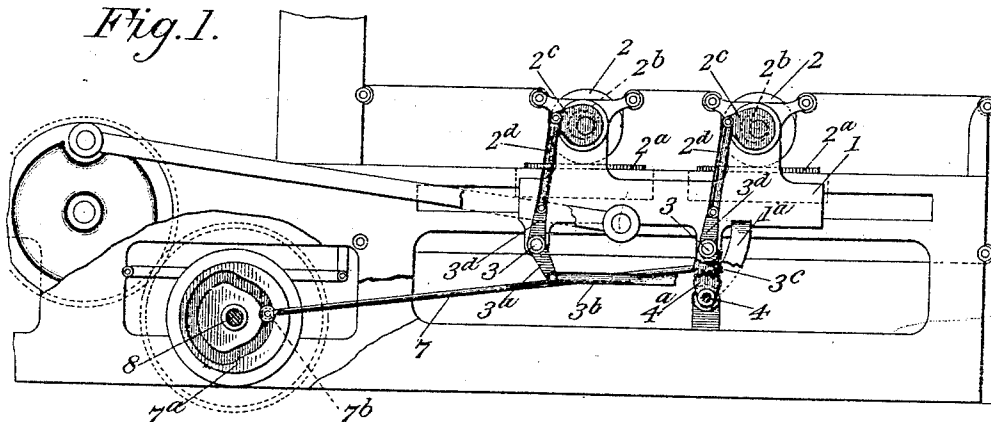


Fig. 2.

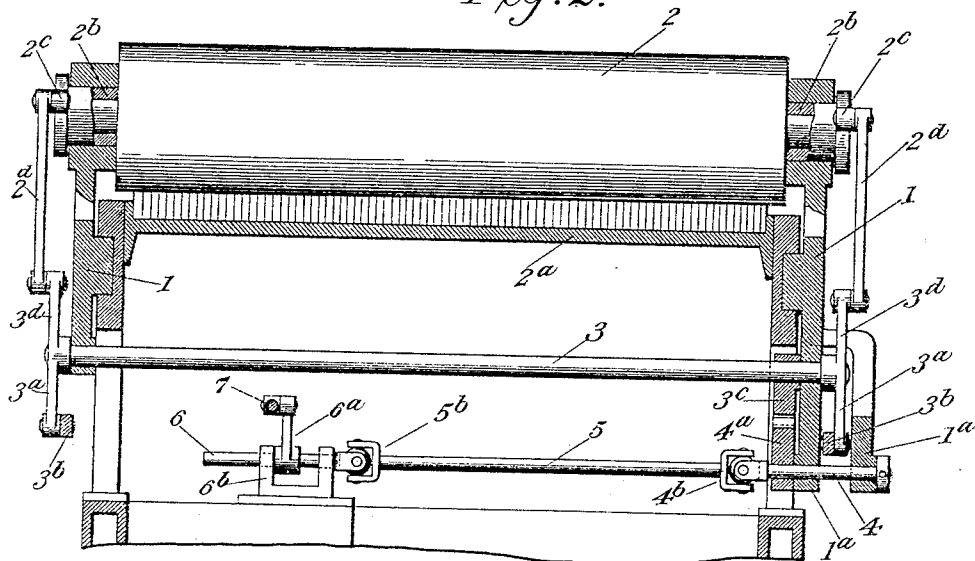
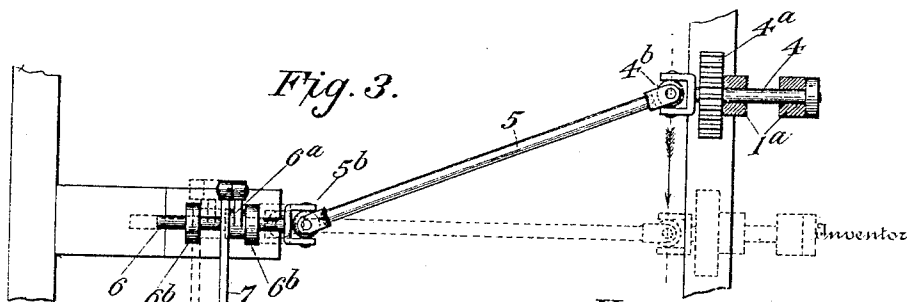


Fig. 3.



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THROW-OFF MECHANISM FOR PRINTING MACHINERY.

No. 876,132.

Specification of Letters Patent.

Patented Jan. 7, 1908.

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To all whom it may concern:

Be it known that I, HENRY F. BECHMAN, of Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Throw-Off Mechanism for Printing Machinery; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in printing machinery wherein throw-off mechanisms are employed and is particularly designed for use in connection with traveling cylinder presses wherein it may be desired to throw the cylinders off-impression by elevating them during their travel, and the object of this invention is to enable the cylinder throw-off devices, which necessarily travel with the cylinder, to be controlled and operated at the proper time by means of a relatively stationary cam or device located on a relatively fixed part of the frame and not traveling with the cylinder. By means of this invention the time of the throw-off of the cylinder can be controlled with the greatest accuracy, and liability of the failure of the throw-off mechanism to work properly, or to disturbance by reason of the momentum of the parts caused by the travel of the cylinder, is obviated.

In the drawings I have illustrated the throw-off mechanism as applied to a traveling cylinder press without attempting however to illustrate any particular construction of such press, as that is immaterial to the present invention.

In said drawings—Figure 1 represents a side elevation of a traveling cylinder printing press equipped with my improved throw-off mechanism; Fig. 2 is a transverse section through Fig. 1 illustrating the throw-off mechanism partly in section; Fig. 3 is a detail plan view of part of such throw-off mechanism.

1 designates sliding cross heads or carriers mounted on opposite sides of the main frame of the press and adapted to be reciprocated back and forth by any suitable means as, for instance, by crank-gears and pitmen, as in the well-known duplex press. In said carriers are journaled cylinders 2 which are rolled back and forth over the beds 2^a with which the cylinders coöperate, and which beds may be fixed or movable as desired.

The cylinder trunnions are journaled in eccentric boxes 2^b which are attached to crank arms 2^c, and by shifting said arms the eccentric bearings 2^b can be turned and consequently the cylinders 2 can be raised or lowered as is well known. The arms 2^c are pivotally connected by links 2^d to crank arms 3^d on rock-shafts 3 which are journaled in the carriers 1, below the beds, the main side frames being open so as not to interfere with the movements of the shafts 3 as the carriers reciprocate. The shafts 3 are preferably connected, so as to be operated in unison, by means of crank arm 3^a united by links 3^b, as shown.

It is obvious that by rocking either shaft 3 the cylinders 2 may be simultaneously raised or lowered if the eccentric boxes 2^b are set alike for both cylinders, as they are shown in the drawings; but obviously by changing the relative position of the boxes 2^b the parts could be so arranged that the cylinders could be thrown off-impression alternately. All the parts thus far described travel with the cylinders.

In order to operate the rock shafts 3 at the proper time in the travel of the cylinders, I employ the following devices: One of the carriers 1 is provided with a depending bracket 1^a adjacent the end of one of the shafts 3, and in said bracket is journaled a rock-shaft 4. On this rock-shaft is keyed a segment 4^a which meshes with a like segment 3^c on the adjacent rock-shaft 3. The other end of shaft 4 is connected by a gimbal joint 4^b with one end of shaft 5, the other end of which is connected by a gimbal joint 5^b with a short shaft 6 rotatably and slidably journaled in bearings 6^b on the main frame below the cylinders. These bearings are preferably located about midway of the path traversed by shaft 4 during the stroke of the cylinder carriage so that although shaft 4 travels, and shaft 6 is fixed relative to shaft 4, the connecting shaft 5 can swing and maintain a constant connection between shafts 4 and 6; and by rocking shaft 6 at any time, shaft 4 can be rocked in any part of its stroke, and during any portion of the travel of the cylinder carriage.

On shaft 6 is fixed an arm 6^a to which is pivotally connected a rod 7 which extends under the bed to a cam 7^a which may be mounted on one of the transverse driven shafts 8 of the press, or the cam may be otherwise mounted and geared by suitable

gearing (not shown), so as to rotate at a speed of say one revolution for each reciprocation of the cylinder carriage. The bar 7 has a roller or pin 7^b engaging a race in the cam 7^a and this cam can be so adjusted on shaft 8 that for each rotation of the cam the shaft 6 will be rocked back and forth; and when the shaft is rocked in one direction it transmits, through the shafts 4 and 6 and segments 4^a and 3^c, a rocking motion to the shafts 3, and consequently the eccentric boxes 2^b are shifted and the cylinders raised or lowered. The cam 7^a can be set forward or back so as to impart a rocking motion to the shaft 6 at the exact time when it is desired to throw the cylinders off or on impression.

From the foregoing it will be seen that the cylinders are thrown-off or on-impression while they are traveling by means of a relatively stationary cam, the motion being transmitted from the relatively fixed shaft 6 on the frame to the traveling shaft 4 on the carriers by means of the swinging shaft 5.

The advantages of this construction will be obvious—as well as its applicability to very many different kinds of traveling cylinder presses. While it is shown as applied to a two-cylinder press, it is obvious that it can be applied to a single-cylinder press or it can be used to operate any number of cylinders mounted on the same carriers. And it is also obvious that if it is not desired to throw the cylinders on or off impression regularly during the operation of the machine, but only intermittently, as when making up the press or when it is not desired to print, that the bar 7 could be disconnected from the cam and controlled by a hand-lever so that the throw-off mechanism will be entirely under the control of the operator, who could throw the cylinders on or off-impression at will without stopping the machine.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In combination, a traveling cylinder, devices for raising and lowering the cylinder mounted on the cylinder carriage, means on the carriage for operating the said devices, a vibrating rock-shaft having one end connected to the devices on the carriage and the other end connected to a relatively fixed member on the frame, and means for rocking said shaft.

2. The combination of reciprocating carriers, a cylinder mounted thereon, devices for raising and lowering the cylinders mounted on the carriers, a rock-shaft journaled on the frame, a vibrating shaft having one end connected with the devices on the carriers and its other end connected with the rock-shaft on the frame, and means for rocking the latter shaft.

3. In a printing press, the combination of

reciprocating carriers, a cylinder journaled thereon, eccentric boxes supporting the cylinder trunnions, a rock-shaft mounted on the carrier, and connections between said rock-shaft and eccentric boxes, a rock-shaft mounted on the frame adjacent the carrier, and a swinging shaft connected to the rock-shaft on the carrier and the rock-shaft on the frame, substantially as described.

4. In combination, a traveling cylinder, devices for raising and lowering the cylinder mounted on the cylinder carriage, a rock-shaft and connections on the carriage for operating the said devices, a vibrating rock-shaft having one end pivotally connected to the rock-shaft on the carriage and the other end connected to a relatively fixed point on the frame, and means for rocking said swinging shaft.

5. The combination of reciprocating carriers, a cylinder mounted thereon, devices for raising and lowering the cylinder mounted on the carriers, a rock-shaft and connections mounted on the carriers for operating said devices, a rock-shaft journaled on the frame, a vibrating shaft having one end connected by a gimbal joint to the rock-shaft on the carriers and its other end connected by a gimbal joint to the rock-shaft on the frame, and means for rocking the latter shaft.

6. In a printing press, the combination of reciprocating carriers, a cylinder journaled thereon, eccentric boxes supporting the cylinder trunnions, a rock-shaft mounted on the carrier, and crank arm and link connection between said rock-shaft and eccentric boxes, a rock-shaft journaled in one of the carriers below the first rock-shaft, means for operating one rock-shaft from the other, a rock shaft mounted on the frame adjacent the carrier, and a swinging shaft connected to the rock-shaft on the carrier and the rock-shaft on the frame, substantially as described.

7. In a printing press, the combination of reciprocating carriers, a cylinder journaled thereon, eccentric boxes supporting the cylinder trunnions, a rock-shaft mounted on the carriers, and connections between said rock-shaft, and the eccentric boxes, a rock-shaft journaled in one of the carriers adjacent the first rock-shaft, means for operating one rock-shaft from the other, a rock-shaft mounted on the frame adjacent the carrier, a swinging shaft connected to the rock-shaft on the carrier and the rock-shaft on the frame, a cam and rod for operating the rock-shaft on the frame from said cam.

8. In a printing press, the combination of a pair of carriers, a plurality of cylinders mounted thereon, throw-off devices for the cylinders, a rock-shaft adjacent each cylinder, connections between said rock-shafts and the throw-off devices whereby said cylinders are raised and lowered as the shafts are rocked, connections between said rock-

shafts for operating them simultaneously, a rock-shaft journaled in fixed bearings on the frame, a swinging shaft and connections between said swinging shaft and the rock-shafts on the carriers, and between said swinging shaft and the rock-shaft on the frame.

9. In a printing press, the combination of reciprocating carriers, a pair of cylinders journaled thereon, eccentric boxes supporting the cylinder trunnions, rock-shafts mounted on the carriers, crank-arms and links connecting said rock-shafts to the eccentric boxes, and connections between said rock-shafts for operating one from the other.

10. In a printing press, the combination of a pair of carriers, a plurality of cylinders mounted thereon, eccentric boxes on said carriers in which the cylinders are journaled, a rock-shaft adjacent each cylinder, connec-

tions between said rock-shafts and eccentric boxes whereby said cylinders are raised and lowered as the shafts are rocked, connections between said rock-shafts for operating them simultaneously; a rock-shaft journaled in one of the carriers, and connections between this rock-shaft and the adjacent rock-shaft on the carrier for operating the latter from the former; with a rock-shaft journaled in fixed bearings on the frame, and a swinging shaft connected by gimbal joints to the rock-shaft on the carrier and to the rock-shaft on the frame, as and for the purpose set forth.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HENRY F. BECHMAN.

Witnesses:

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