(No Model.)

S. WHITLOCK.

PRINTING MACHINE.

No. 413,468. Patented Oct. 22, 1889.

Fig. 1.

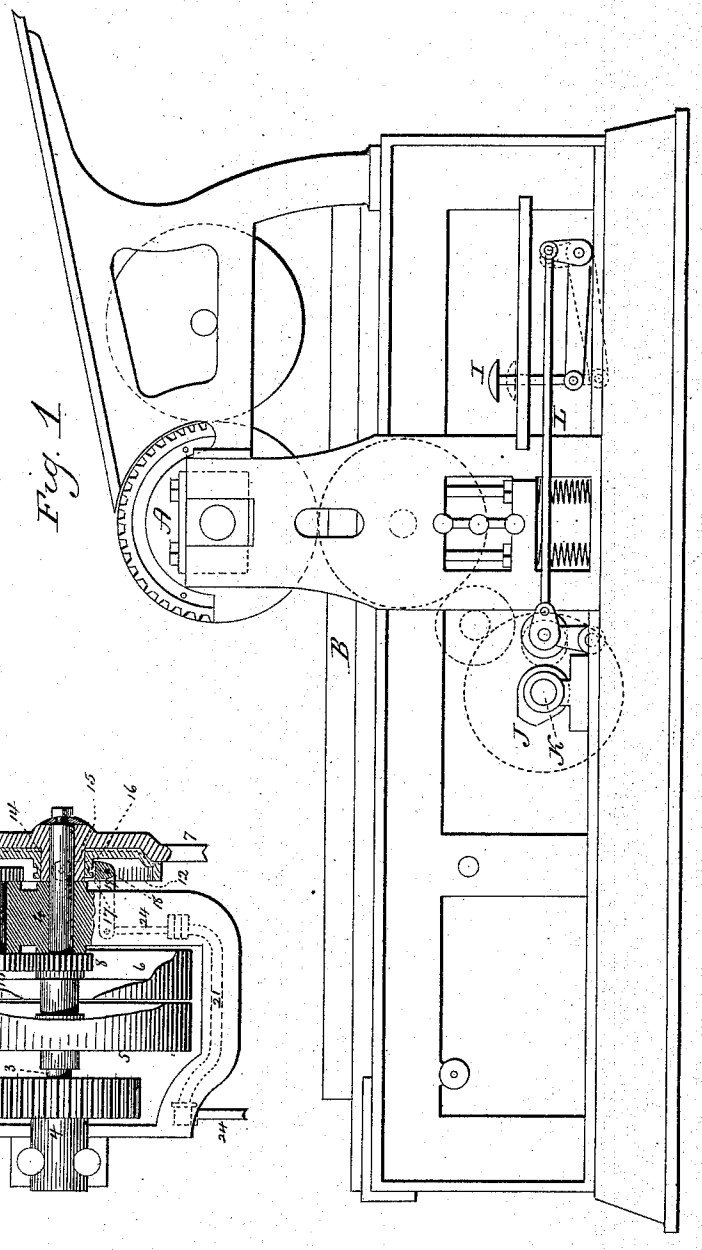
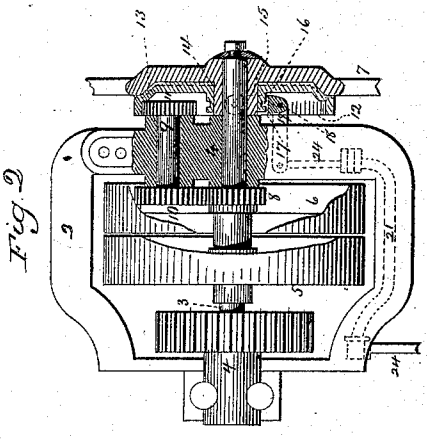


Fig. 2.



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STURGES WHITLOCK, OF BIRMINGHAM, CONNECTICUT, ASSIGNOR TO THE WHITLOCK MACHINE COMPANY, OF SAME PLACE.

PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,468, dated October 22, 1889.

Application filed December 24, 1888. Serial No. 294,541. (No model.)

To all whom it may concern:

Be it known that I, STURGES WHITLOCK, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new Improvement in Printing-Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view of so much of a printing-press as necessary to illustrate the invention; Fig. 2, a sectional top view of the back-up mechanism.

This invention relates to an improvement in that class of cylinder printing-presses in which a reciprocating bed passing beneath the cylinder is employed. It is often desirable to run the cylinder backward to some extent—as, for instance, when the grippers shall have failed to take a sheet. Mechanical appliances for producing this back-up movement, so that the power which drives the press may be utilized to produce such back-up movement, are common and well known. Such a mechanism is seen in a patent granted to me, No. 362,344, dated May 3, 1887, and other mechanisms have been employed for the same purpose. That the back-up may be produced by the attendant of the machine a pedal I is arranged in a convenient position at the platform, as seen in Fig. 1, so that the attendant placing his foot upon the pedal may force it downward, as indicated in broken lines, and thereby reverse the action of the power, so that the cylinder will be rotated in a backward direction, and when the desired point is attained the foot is removed and the pedal automatically returns, disconnecting the power or turning it into the advance direction. Under this arrangement there is liability of the back-up movement continuing too long. Such continued back-up movement will advance the type-bed while the cylinder is revolving in the reverse direction, and this would bring the teeth of the segment on the cylinder into the path of the teeth of the rack, the two then moving in opposite directions. In such case breakage of some character in the machine is unavoidable. The back-up is usually desirable only to the extent to bring the grippers to the position to take the sheet.

The object of this invention is to provide a mechanism which will automatically stop the cylinder at a predetermined point when backing up; and it consists in a cam arranged upon a revolving shaft of the machine, the active point of which corresponds to the predetermined point desired to stop the cylinder, with a connection from the back-up mechanism into the path of said cam when the said back-up mechanism is in operation, and whereby the said cam at said predetermined point will throw out said back-up mechanism.

A represents the cylinder, and B the reciprocating type-bed, of a printing-press of common construction, the mechanism for imparting the reciprocating movement to the bed and the rotary movement to the cylinder not being fully illustrated, as such mechanism is immaterial to the present invention.

In order to insure the back-up movement of the cylinder only to a predetermined point, I have provided an automatic device which will throw out the back-up mechanism when the cylinder shall have reached a predetermined point, and this mechanism consists of a cam J, arranged upon the shaft K, or any other shaft which will have the requisite time of rotation, and then from the back-up lever a rod L extends toward the cam and into line therewith, but so that when the pedal I is raised—that is, when the press is regularly working—the rod L will be out of the path of the cam J, but as the pedal is depressed the rod L will be turned toward the cam and into the path thereof. The projection of the cam is at a point corresponding with the predetermined position at which it is desired to stop the cylinder. Then under a back-up movement the cam J will strike the rod L and impart to the back-up mechanism a disengaging movement, so as to throw it out at the time the cam shall have so moved the lever L, and consequently the cylinder will be forced to stop at the predetermined point indicated by the position of the cam J,

and this predetermined point may be adjusted or varied by the corresponding adjustment or variation of the cam J.

In order to show one back-up mechanism with which my invention is adapted to be combined, I represent that for which Letters Patent No. 362,344 were granted to me May 3, 1887. This is shown in Fig. 2.

2 represents a frame or bracket, which is understood to be a part of the frame of the machine; 3, the driving-shaft or shaft through which power is communicated to the machine. This shaft is supported in suitable bearings 4 4, and carries a pulley 5, fixed to the shaft, and through which revolution is imparted directly to the shaft 3. This shaft also carries a loose pulley 6, arranged in relation to the fixed-pulley 5 in the usual manner for tight and loose pulleys.

7 is the fly-wheel, which is fixed to the outer end of the shaft.

On the hub of the loose pulley 6 a toothed pinion 8 is fixed, so as to partake of the revolution of the pulley 6.

Parallel with the shaft 3 a second shaft 9 is arranged in suitable bearings, extending into the loose pulley 6 and carrying a gear 10 upon its inner end corresponding to the pinion 8, and so that the said pinion 8 and gear 10 will work together, that the revolution of the pinion 8 may be communicated to the shaft 9. On the opposite end of the shaft 9 a pinion 11 is fixed, and loose upon the shaft 3, outside the pinion 8, an internal gear-wheel 12 is arranged, its internal teeth corresponding to the pinion 11, and so that the revolution of the pinion 11 will be imparted to the internal gear 12, the said internal gear working loosely on the shaft 3, or on the hub of the fly-wheel, which is the same thing. The outer side of the internal gear 12 projects outward, forming a frustum of cone shape 13, and the hub 14 of the fly-wheel is correspondingly recessed upon its inner side, so that the projection 13 of the internal gear 12 will stand within the said recess. The gear 12 is movable longitudinally on the driving-shaft or hub of the fly-wheel to such an extent that the conical surface of the projection 13 may be brought into close contact with the corresponding surface of the fly-wheel or withdrawn therefrom, as seen in broken lines. This arrangement of the gear 12 and its projection 13 with the corresponding surface of the fly-wheel acts as a common friction-clutch, so that when the wheel and gear are engaged in frictional contact the revolution of the gear 12 will be imparted to the fly-wheel, or when the gear 12 is withdrawn from the fly-wheel then the fly-wheel will be free and independent of the revolution of the gear 12.

The hub 15 of the gear 12 is constructed with an annular groove 16, into which the forked arm 17 of a lever hung upon a fulcrum 18 works. From the fulcrum 18 a second arm 19 extends, and by which the fork may be thrown outward or inward to correspondingly move the gear 12 and its projection 13 and force it into frictional contact with the fly-wheel or withdraw it therefrom, as the case may be.

In operation suppose the band to be on the fixed pulley 5 and the machine running in the usual manner, and in what may be called the "advance" direction, and that the gear 12, with its projection 13, is withdrawn from the hub 14, so as to prevent engagement. In this condition the machine runs as in ordinary work, and if the band be thrown onto the loose pulley 6 that pulley will revolve loosely on the shaft and permit the machine to stop. Now, while the band is driving the loose pulley and the machine at rest the pinion 8 on the hub of the loose pulley will impart revolution to the shaft 9 and to the gear 12 and projection 13, (which may properly be called the "clutch;") but because of the disengagement of the clutch from the hub 14 the loose pulley runs without effect upon the machine. The clutch, because of the gearing, runs in the opposite direction to the pulley. If now it be desired to run the machine backward, the backwardly-revolving clutch is thrown into engagement with the hub 14, and the power of the band through the pulley 6 is applied to the fly-wheel to give to it the backward direction of the clutch, and when a sufficient extent of backward movement has been produced the clutch is withdrawn. Under this arrangement the gear portion of the mechanism always remains in engagement, revolving only with the loose pulley, and because of the natural friction between the gearing the loose pulley will generally remain stationary while the machine is working, the driving-shaft 3 revolving loosely in the loose pulley and in the clutch, and the clutch mechanism being of the simplest possible character the wear of this reverse mechanism is very little, but yet is always ready for easy application. From the clutch-fork or lever 17 connection is made with the foot-pedal through a rock-shaft 21 and rod 24, which extends to an arm (not shown) on the rock-shaft 25, with which the pedal is connected, as seen in Fig. 1, and so that as the pedal is depressed the rock-shaft 25 will be turned accordingly and throw the mechanism into a back-up action, and when the cam J comes into action it will disengage the back-up mechanism, as before described.

The illustration of this back-up mechanism will be sufficient to enable those skilled in the art to apply my invention to other back-up mechanisms, so that the impression-cylinder may be stopped at a predetermined point, as I have described.

It will be understood that any of the known substitutes for the foot-pedal for engaging the back-up mechanism may be employed.

While this automatic disengagement of the back-up mechanism is specially adapted to a printing-press in which the cylinder is provided with a toothed segment and the

type-bed with a corresponding rack, this capacity of positively stopping the cylinder at a predetermined point is desirable in other constructions of press. The invention, therefore, is not to be understood as limited to a press in which the cylinder and type-bed are positively engaged as by rack and segment.

I claim—

The combination of the impression-cylinder and reciprocating bed of a printing-press, a back-up mechanism substantially such as described, a cam on a revolving shaft at a position corresponding to a predetermined point at which it is desired to stop the back-up of the cylinder, and a connection from said back-up mechanism, substantially such as described, to a point in the path of the said cam, substantially as and for the purpose described.

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