

No. 893,745.

PATENTED JULY 21, 1908.

H. W. MORGAN.
MACHINE FOR PRINTING ON BOARDS.

APPLICATION FILED OCT. 2, 1905.

3 SHEETS—SHEET 1.

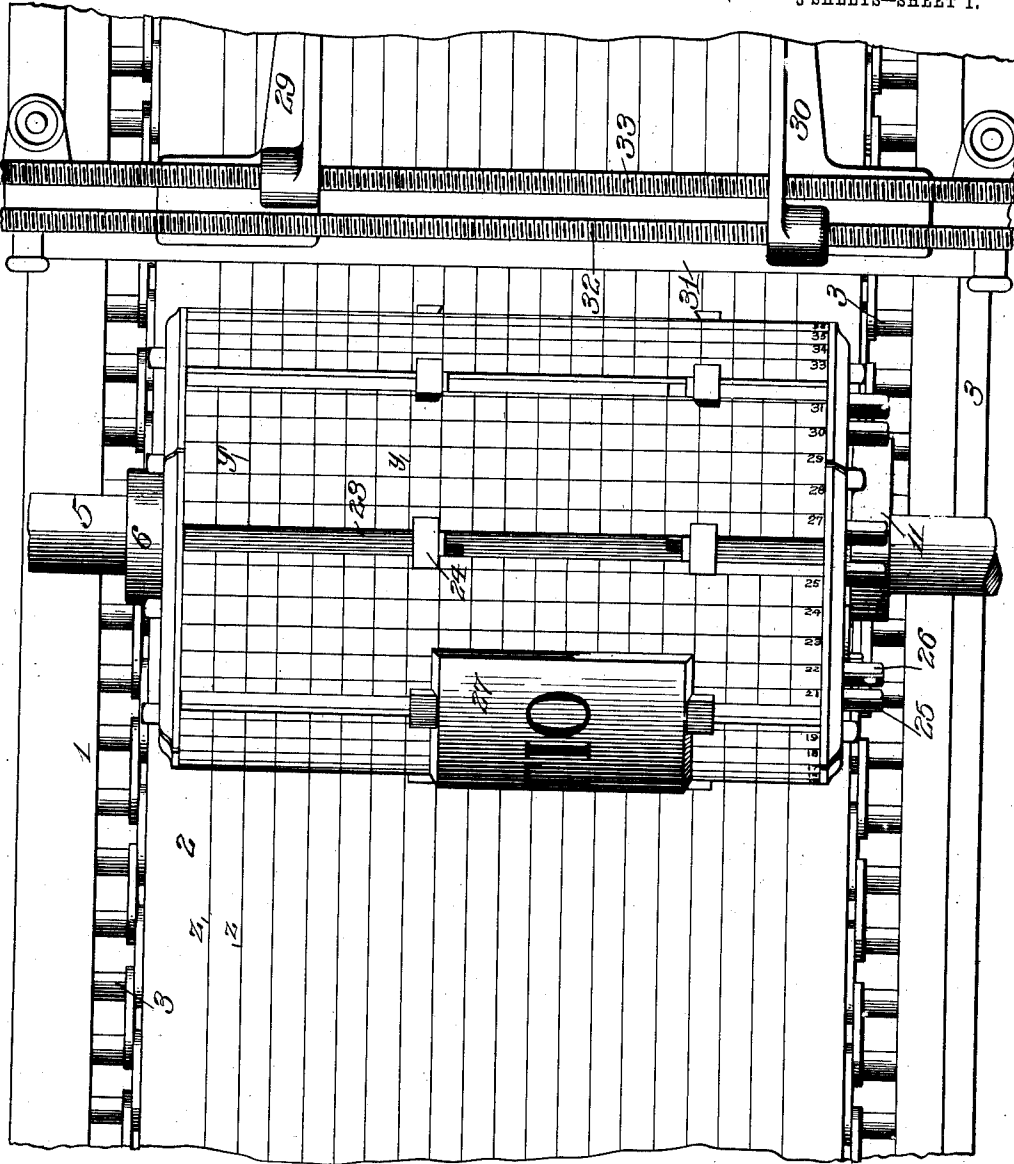


Fig. 1.

Witnesses

Walter B. Payne
Clarence A. Bateman

Inventor

Henry W. Morgan

By J. L. Church
Attorney

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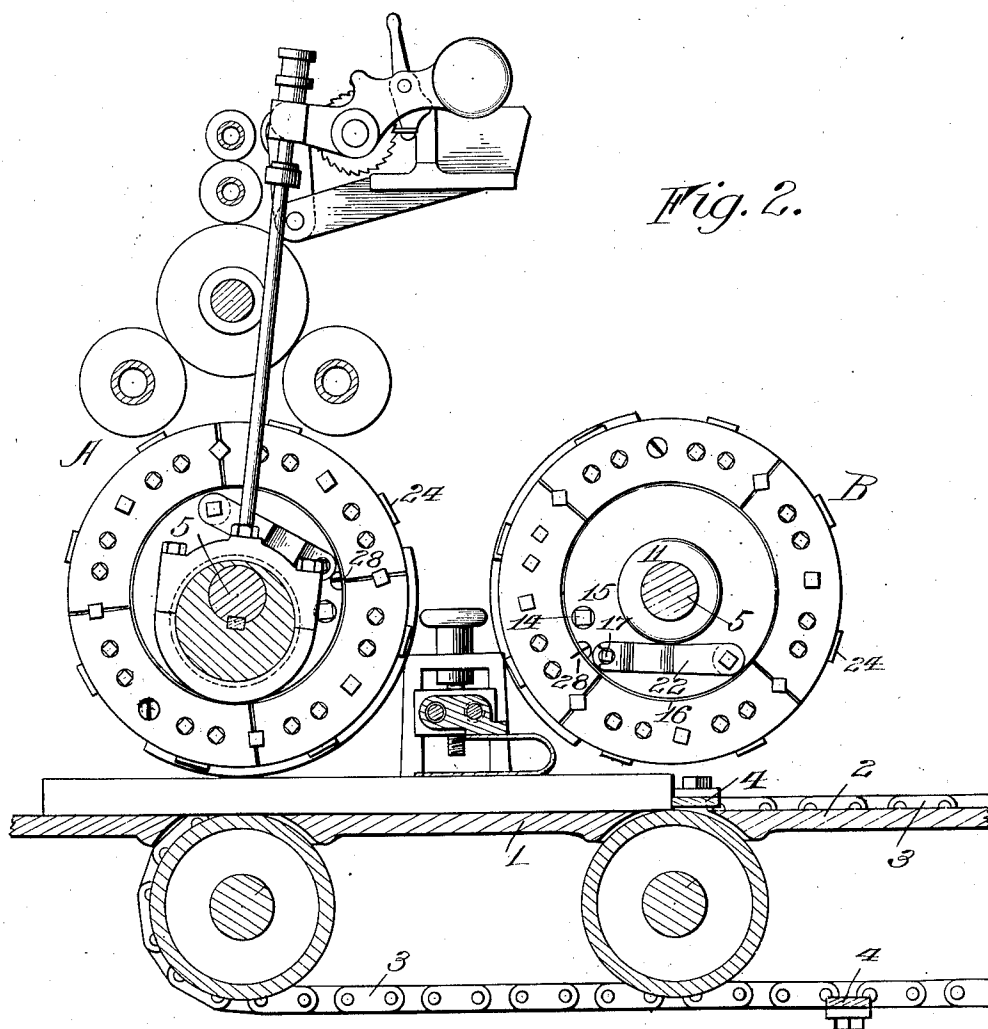


Fig. 2.

Witnesses.

Matt B. Payne
Clarence A. Bateman

Inventor.

Henry W. Morgan
by Hudson & Connel
his Attorney.

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3 SHEETS—SHEET 3.

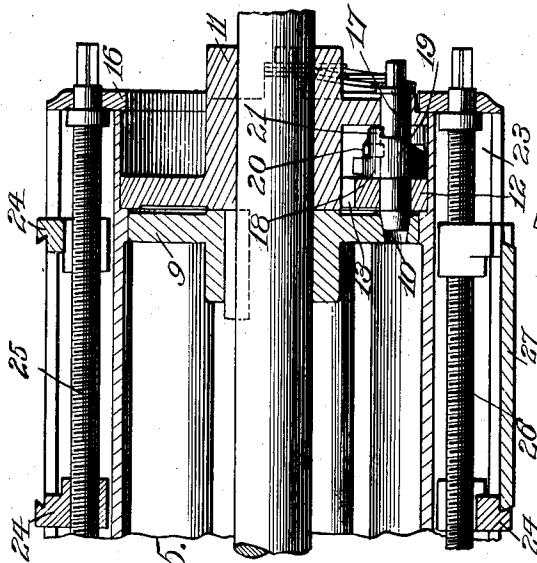


Fig. 5.

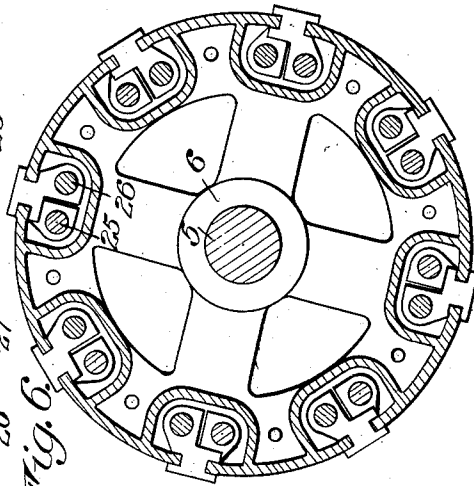


Fig. 6.

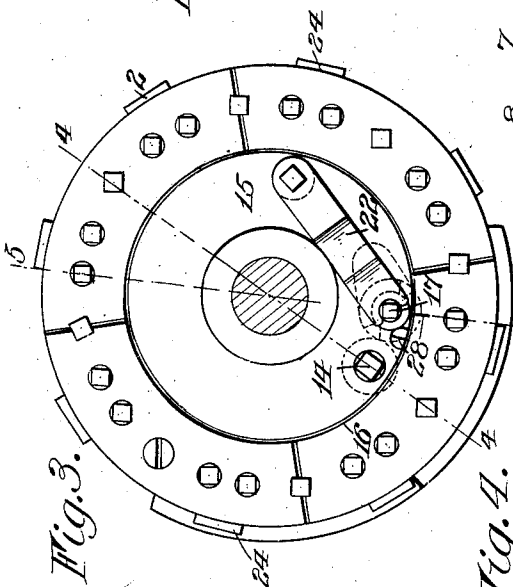


Fig. 3.

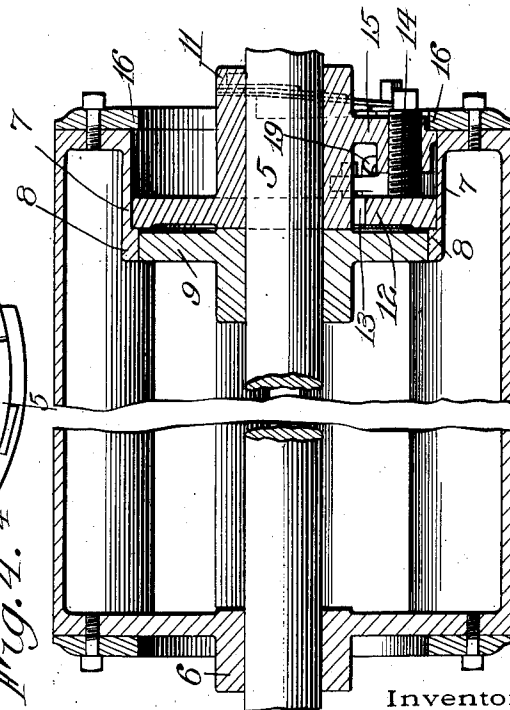


Fig. 4.

Witnesses.

Walter B. Payne
Caroline A. Bateman

Inventor.

Henry W. Morgan
by Edmund B. Church
Attorney.

UNITED STATES PATENT OFFICE.

HENRY W. MORGAN, OF ROCHESTER, NEW YORK.

MACHINE FOR PRINTING ON BOARDS.

No. 893,745.

Specification of Letters Patent.

Patented July 21, 1908.

Original application filed January 8, 1903, Serial No. 138,200. Divided and this application filed October 2, 1905.

Serial No. 280,935.

To all whom it may concern:

Be it known that I, HENRY W. MORGAN, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Machines for Printing on Boards; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference numerals marked thereon.

My present invention relates to improvements in printing machines, and particularly to that kind of cylinder machines adapted to printing on boards, and the purpose of the present invention is to provide certain improvements for facilitating the positioning of the type forms or dies on the cylinder relatively to the feed devices, whereby the inked impression from the cylinder may be accurately positioned on the boards as they are fed past the cylinder as described in my prior patent No. 868,684 granted October 22nd, 1907 on an application of which the present one is a division.

To these and other ends my invention consists in certain improvements and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of this specification.

In the drawing: Figure 1 is a plan view of a printing machine embodying my invention, parts of the machine being omitted; Fig. 2 is a vertical section of a portion of the machine, showing a pair of printing cylinders in end elevation; Fig. 3 is an end view of a printing cylinder constructed in accordance with my invention; Fig. 4 represents a section through the axis of the cylinder on the line 4—4 of Fig. 3; Fig. 5 represents a section through the cylinder on the line 5—5 of Fig. 3; and Fig. 6 represents a transverse section of the cylinder.

Similar parts are designated by the same reference characters in the several views.

The present embodiment of my invention is shown in connection with a printing machine of the kind described in my prior application aforesaid, comprising generally a frame 1 having a horizontal bed 2 thereon over which the boards to be printed on are fed by means of the traveling carrier chains 3 and the transversely-arranged feed bars 4

connecting them and which move longitudinally of the bed.

Extending transversely above the bed are the printing cylinders A and B, one or more of which may be employed as necessary or desirable, these cylinders being substantially duplicates, each being supported on a driving shaft 5 mounted in suitable bearings and connected to suitable operating mechanism whereby rotary motion may be imparted to the cylinder, as shown in my said prior application. The cylinder is loosely mounted on this shaft by means of the hub 6 at one end and an internal cylindrical drum 7 at its opposite end which has an inward flange 8 bearing loosely on the periphery of a disk 9, the latter being fixed to the shaft 5 and provided with a recess or aperture 10 extending axially of the cylinder.

Within the interior cylindrical drum of the cylinder is arranged a sleeve 11 the hub of which is mounted loosely on the shaft 5, a disk 12 on the sleeve fitting within the drum of the cylinder and resting in coöperative relation with the flange 8 of the drum. A portion of this disk 12 is separated from the hub portion of the sleeve as by the slot 13, to permit it to yield laterally of the disk, and operating upon this yielding portion is a screw 14, the latter being threaded in the outer disk 15 of the sleeve and provided with a squared end exteriorly of the cylinder to receive an operating wrench. On the adjacent end of the cylinder is fixed a flange 16 which extends inwardly beyond the drum 7 and is arranged parallel to the inner flange 8, lying in coöperative relation with the outer disk 15 of the sleeve. By tightening the screw 14 the inner end of the latter will spring the yielding portion of disk 12 laterally into engagement with the flange 8 of the cylinder, while the reaction between the screw and disk 15 will cause the latter to spring outwardly into engagement with flange 16 of the cylinder, and thus by the expansion of these disks against the flanges of the cylinder, the latter will be clamped together with sleeve 11.

Extending through the disks 12 and 15 of the sleeve 11 is a bolt or pin 17, the inner end of which is formed to fit the recess or aperture 10 of the disk 9, while its outer end is formed to receive an operating wrench. Surrounding this pin is a cam 18 having the in-

clines 19 thereon to cooperate with the projections 20 of the pin to retract the latter from the aperture 10 when rotated, and the shoulders 21 for limiting the rotation of the pin. This pin 17 engaging in recess 10 serves to lock the sleeve 11 to the disk 9 which is fixed to the shaft, causing the motion of one to be transmitted to the other, and the pin is normally held in operative position by means of a spring 22 which has a bearing on the outer end thereof, so that this pin cannot become disengaged from the disk 9 except when it is rotated, causing the projections 20 thereon to cooperate with the cam 18.

The surface of the cylinder is provided with a number of axially-arranged grooves 23 in which operate the paired clamping dogs 24, the latter being operated by means of the longitudinal screws 25 and 26 so that the type form or die 27 may be clamped in position on the periphery of the printing cylinder, and in order to facilitate the positioning of the die relatively to the feeding devices for advancing the boards to be printed, the surface of the cylinder is divided circumferentially by a series of axially-arranged divisions or graduations which are spaced equidistantly and for convenience may be provided with a scale beginning at zero and extending for instance by inches around the circumference of the cylinder, an index 28 being provided to designate the zero mark on the cylinder when the latter is in normal position relatively to the shaft 5, at which time the zero mark on the scale of the cylinder will register with the forward edge of the feed bar 4 or the rear edge of the board as it is fed past the cylinder.

For convenience, the cylinder may be divided by a series of circumferentially-arranged divisions y , and the bed correspondingly divided transversely by the longitudinally-extending lines or divisions z , and by means of these divisions of the bed and cylinder, the die may be readily positioned in a direction longitudinally of the cylinder. The lateral guides 29 and 30 are, as in the machine of the aforesaid application, adjustable on ways 31 in a direction transversely across the bed, being operated by the screws 32 and 33, and after setting these guides on the proper divisions on the bed corresponding to the width of the boards to be printed on, any desired margin may be left on the printed board by setting the die on the cylinder so as to register with the proper circumferential divisions thereon.

In roughly positioning the die on the cylinder, it may be found by trial that the impression is not positioned precisely in a direction longitudinally of the board, particularly when two or more cylinders are employed for printing in several colors in which case it is essential to obtain an accurate registration between the several impressions of the vari-

ous cylinders, and by turning the cylinder in the proper direction about the shaft after the screw 14 has been loosened, the cylinder may be readily adjusted either in advance or behind the operating shaft 5. Normally, the cylinder is secured to sleeve 11 by means of the screw 14, but after loosening this screw the cylinder may be rotated in either direction relatively to the sleeve, and as the latter is locked to the disk 9 of the shaft by the pin 17, rotary motion of the shaft will be transmitted to the printing cylinder.

In applying and removing the type form or dies from the cylinder, it may happen that the latter occupies such an angle in its rotation that the dies are inaccessible, and this difficulty is removed by applying a wrench to the pin 17 and giving it a partial rotation, causing it to withdraw its inner end from the recess or aperture 10 of the disk 9 on the shaft. This will unlock the sleeve 11 relatively to the driving shaft, and consequently permit the cylinder and with it the sleeve 11 to be freely rotated until the type form or die is in a conveniently accessible position, the locking pin 17 being automatically returned to locking position with the recess or aperture 10 of disk 9 by means of the spring 22.

A printing machine embodying my improvements enables the type forms or dies to be accurately and expeditiously positioned and secured to the printing cylinder in such relation to the feeding mechanism that the printed impression will be precisely arranged on the printed boards, and in cases where a plurality of cylinders are employed for printing in different colors, an accurate registration of the several impressions is readily secured, as each printing cylinder is clamped to the sleeve 11 by means of the screw 14 in such a way that the cylinder may be adjusted in various angular relations therewith, and the sleeve 11 in turn is locked to the disk 9 on shaft 5 by means of the pin 17, and while this locking pin normally rests in its cooperating recess 10 in disk 9 for transmitting rotary motion of the driving shaft to the printing cylinder, by rotating this pin and withdrawing it from the aperture 10, the cylinder may be rotated freely relatively to the operating shaft without disturbing the adjustment between the cylinder and the sleeve, and as the latter are locked together by frictional engagement there is no liability of their loosening during the operation of the machine.

I claim as my invention.

1. In a printing machine, the combination with a suitable bed, of a cylinder adapted to receive the printing form, a shaft for operating it, devices for securing the shaft and cylinder in fixed relation at different positions circumferentially of the shaft, and a locking device for permitting relative rotation of the cylinder and shaft independently of said se-

curing devices, and serving to lock the cylinder in predetermined relation to the shaft.

2. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed to the shaft, and clamping devices rotatable on the shaft and frictionally engaging the cylinder and a device for locking the clamping device to the disk for transmitting the motion of the shaft to the cylinder.

3. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed on the shaft, a sleeve revoluble on the shaft, means for positively locking and unlocking the disk relatively to the sleeve, and connecting means between the sleeve and cylinder capable of permitting circumferential adjustment of the latter and the shaft.

4. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a sleeve loosely mounted on the shaft, means for connecting the cylinder and sleeve and capable of permitting circumferential adjustment between the sleeve and cylinder, and a locking device carried by the sleeve and cooperating with the disk for positively locking the sleeve in predetermined relation to said shaft.

5. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed on the shaft, a sleeve revoluble on the shaft, means for locking the disk and sleeve in predetermined relation about the shaft, and capable of being unlocked to prevent rotation of the cylinder on the shaft, and a connection between the sleeve and cylinder for permitting circumferential adjustment of the cylinder relatively to the shaft independently of the locking means.

6. In a printing machine, the combination with a bed, of a form cylinder having a drum formed therein and provided with oppositely arranged flanges thereon, a shaft for operating the cylinder, a sleeve on the shaft and within said drum having clamping surfaces corresponding to the flanges of the cylinder, and means for engaging the clamping portions and the flanges to form a connection between the cylinder and sleeve.

7. In a printing machine, the combination

with a bed, of a form cylinder having a pair of annular flanges thereon, a sleeve having relatively yielding clamping portions corresponding with those of the cylinder, means for spreading the clamping portions into frictional engagement with the flanges of the cylinder, and a shaft operating on said sleeve for rotating the cylinder.

8. In a printing machine, the combination with a bed, of a form cylinder having spaced flanges thereon, a sleeve having spaced disks thereon arranged in coöperative relation with the flanges of the cylinder, one of the disks having a yielding portion partially separated from the body of the sleeve, and a device passing through the disks of the sleeve and operating on the yielding portion thereof for expanding the disks into frictional engagement with the flanges of the cylinder, and means connected to the sleeve for operating the cylinder.

9. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed on the shaft, a sleeve loose on the shaft and adjustable circumferentially relatively to the cylinder, and interlocking means between the sleeve and disk for locking them together and to the shaft in predetermined relation.

10. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed on the shaft, a sleeve loosely mounted on the shaft independent of the cylinder, a movable pin for detachably connecting the sleeve and disk in predetermined relation and devices for connecting the cylinder in adjusted position on the sleeve.

11. In a printing machine, the combination with a bed, of a form cylinder, a shaft for operating it, a disk fixed on the shaft, a sleeve loose on the shaft and adjustably connected to the cylinder, a movable pin carried by the sleeve and cooperating with a recess of the disk, a cam operating on the pin for disengaging it from the disk, and a spring operating on the pin for normally retaining it in locking engagement with the disk.

HENRY W. MORGAN.

Witnesses:

CLARENCE A. BATEMAN,
G. WILLARD RICH.