W. S. WARNOCK.

PRINTING PRESS CYLINDER.

APPLICATION FILED SEPT. 3, 1907.

999,279. Patented Aug. 1, 1911.

Fig 1.

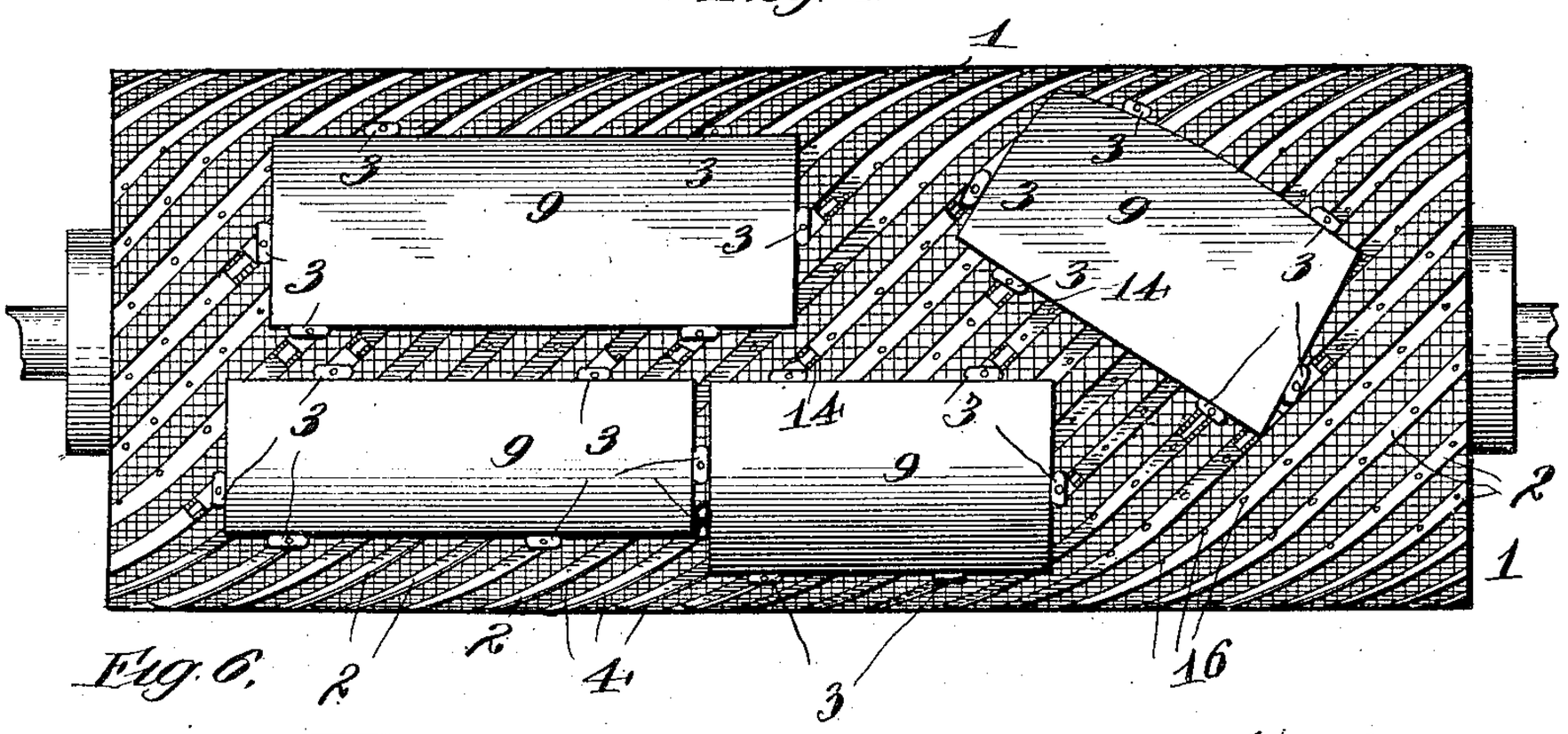


Fig 6.

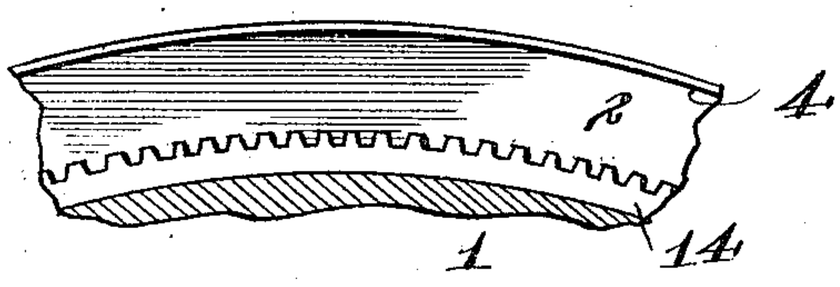


Fig 2

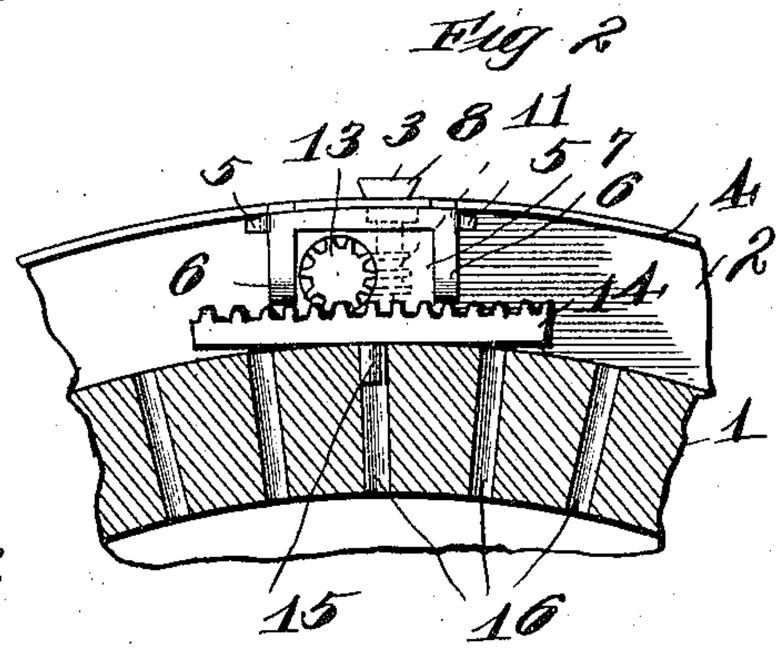


Fig 3.

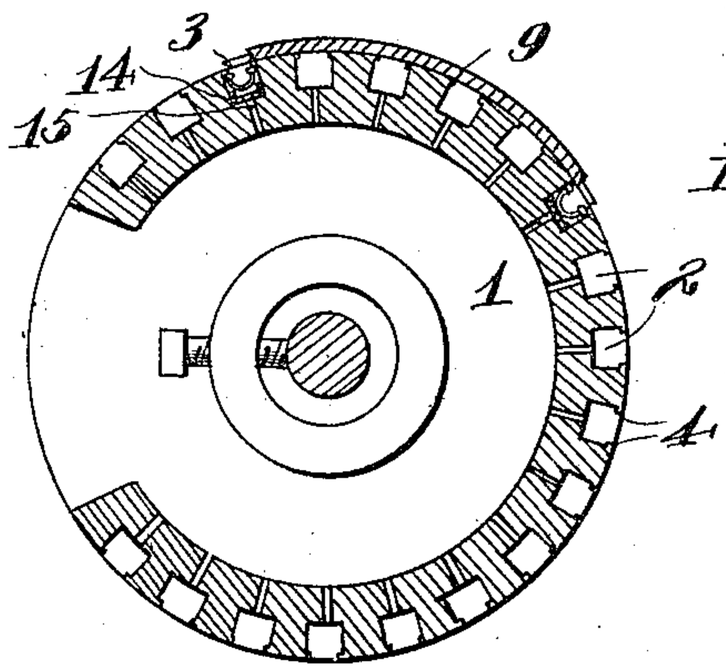


Fig 4.

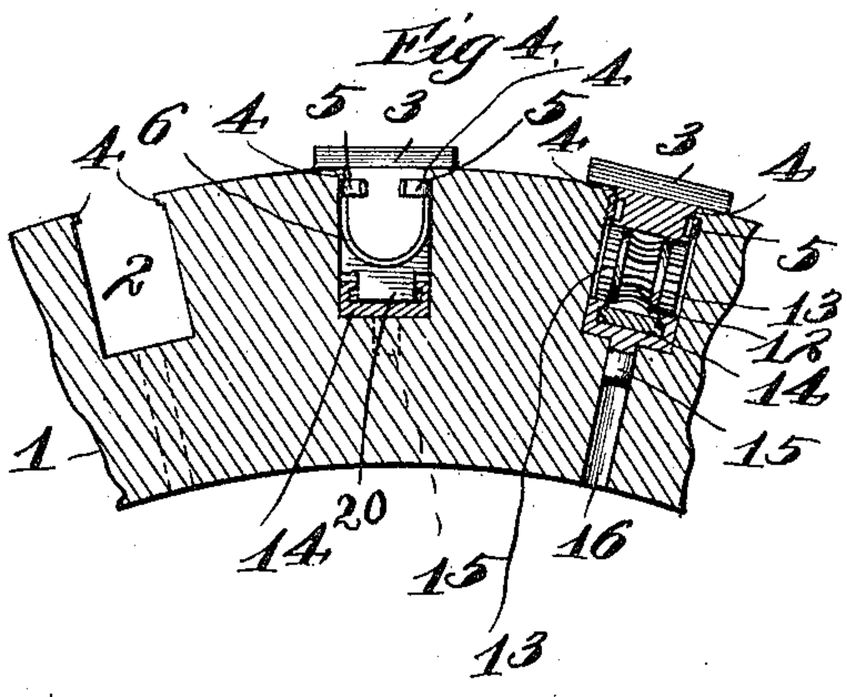
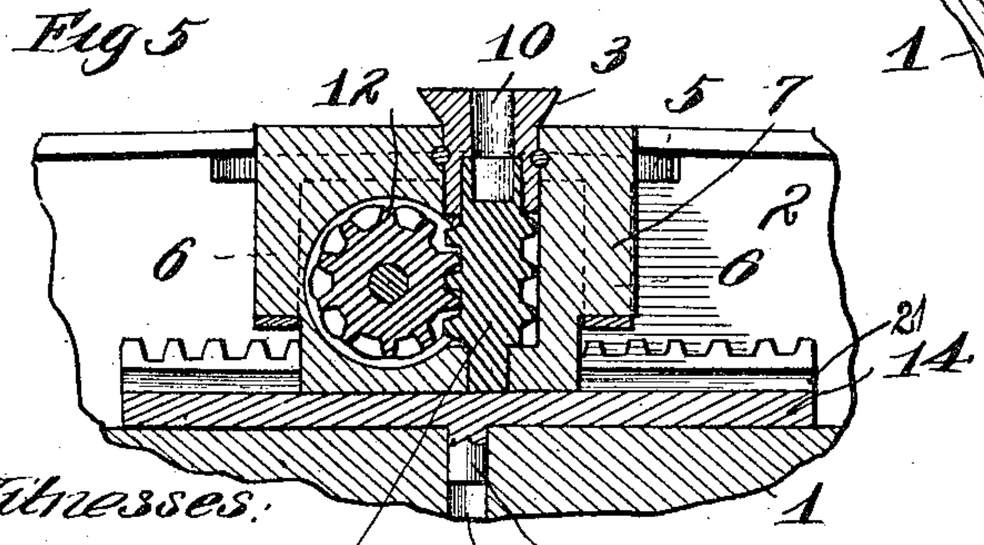


Fig 5



Witnesses:

G. W. Bauerschmidt

L. S. Stark

Inventor

Wallace S Warnock,

By G. L. Gregg Atty

UNITED STATES PATENT OFFICE.

WALLACE S. WARNOCK, OF CHICAGO, ILLINOIS.

PRINTING-PRESS CYLINDER.

999,279. Specification of Letters Patent. **Patented Aug. 1, 1911.**

Application filed September 3, 1907. Serial No. 391,136.

To all whom it may concern:

Be it known that I, WALLACE S. WARNOCK, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Printing-Press Cylinders, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to printing presses of the kind employing rotating cylinders or bodies which carry the plates from which the impressions are to be struck, and has for its object an improvement in the construction of such cylinders.

In accordance with my invention, I groove the external surface of the plate holding cylinder so that plate holding devices may find lodgment in the grooves of the cylinder.

I know that I am not the first to groove plate holding cylinders, it having been proposed hitherto to provide two sets of parallel slots upon the outer surface of the plate holding cylinder, one set of slots being disposed at right-angles to the other, one set of slots being parallel with the axis of the cylinder and the other set of slots being at right-angles to the axis of the cylinder. In accordance with my invention, I preferably have but one set of slots, and these slots are spirally disposed, whereby many important advantages are gained over the prior construction above described, among which may be mentioned that by my improved construction, a better lodgment is afforded for the holding devices inserted within the grooves, owing to the directions of the walls of the grooves with respect to the plane of rotation of the cylinder. Moreover, owing to the direction of the slots in the device of my invention, the tendency for the plate to be depressed into the grooves is materially lessened, and, in fact, is practically eliminated with my construction. With the prior constructions, the plates frequently became depressed into the grooves. With my construction there is sure to be sufficient support at all plate supporting portions of the cylinder, whereas in the prior constructions this assurance was lacking. With prior constructions it was necessary to thicken the plates in order partially to overcome the dangerous tendency of depressing the plates into the grooves. The thickened plates were, of course, produced at increased cost of workmanship and material. By means of my invention I am enabled to employ plates of the same standard of thickness as are employed upon flat bed presses.

I will explain my invention more fully by reference to the accompanying drawing, showing the preferred embodiment thereof, in which—

Figure 1 shows a cylinder constructed in accordance with my invention, in elevation, a number of plates being indicated thereupon. Fig. 2 is a sectional view taken along a portion of one of the grooves showing one manner of retaining a printing plate holder in position. Fig. 3 is an end sectional view of the structure shown in Fig. 1. Fig. 4 is an enlarged detail sectional view of the structure as it appears in Fig. 3. Fig. 5 is a longitudinal sectional elevation of one of several forms of printing plate holders that may be disposed within the spiral grooves. Fig. 6 indicates a modification of the structure shown in Fig. 5.

Like parts are indicated by similar characters of reference throughout the different figures.

The plate supporting cylinder 1 has provided therein a series of spirally disposed grooves 2, there being desirably but one set of grooves, which grooves are parallel with each other, which are constructed to receive any suitable form of plate holding devices, such as that indicated at 3, for example. In the form of the invention illustrated, each groove is provided with overhanging lips 4, beneath which retaining springs 5 may be disposed, these retaining springs being curved to conform to the curved nether surfaces of the lips 4 4. The spring portions 5 are joined by spring loops 6 and are so shaped that a suitable implement may be employed to draw the portions 5 together against the action of the spring portion 6, so that the structure 5—6 may be contracted to permit its insertion within a groove and its removal therefrom. The spring structure 5—6 is carried upon the base 7 of a plate engaging hook 8, at least some of the hooks that engage a plate indicated at 9 in the drawing being adjustable toward and from the plate so that said plate may be firmly clamped in position.

I do not herein claim an adjustable hook *per se*, but have illustrated one construction of clamping hook in order that the adaptability of my invention may be readily appreciated.

In the form of register hook illustrated

particularly in Figs. 2 and 5, an opening 10 is provided through the hook or jaw 8 so that a tool may be passed therethrough into engagement with a worm shaft 11, which worm shaft is in mesh with a worm wheel 12 that carries upon its ends, pinions 13. These pinions 13 mesh with racks 14, which racks may be in permanent association with the cylinder, as indicated in Fig. 6, or may be in separable association with the cylinder, as indicated in Figs. 2 and 5, in which latter construction, which is the preferred construction, the racks are provided with pins 15 that engage with holes or recesses 16 in the bottoms of the cylinder grooves. Thus the grooves are provided with anchorage formations against which the register hooks may work directly or indirectly. I do not wish to be limited to the employment of recesses 16 and the pins 15 for establishing the anchorages against which the clamping hooks may work. By turning the shaft 11, the pinions 13 are caused to travel along the racks 14 so as to force clamping engagement between the jaws 8 and the engaged plate 9. In order that the plates may be disposed at any desired angle upon the cylinders, the jaws 8 are desirably swiveled as illustrated in Fig. 5, and said jaws are desirably provided with two engaging surfaces, so that when moved in one direction, they may engage one plate, and when moved in another direction, they may engage another plate. Where the racks 14 are permanently anchored upon the cylinder, the thrust occasioned by the pinions 13 is directly received by the cylinder. Where the racks are separably disposed, the thrust is received by the cylinder through the agency of the pin 15. It will be seen that by the provision of the separable racks 14 a great amount of machine work is saved, for if the said racks were in fixed relation with the cylinder, as indicated in Fig. 6, they would have to be continuously disposed throughout the lengths of the spiral grooves. As shown in Figs. 4 and 5, the racks 14 are connected to the base 7, with the base slidable thereon to form a unitary structure of base, rack, jaw and gearing. The base 7 at its lower portion is provided with a T-formation 20 engaging into the T-groove 21 formed between the racks 14. It will be seen that the racks 14 act as purchase devices against which the clamps act in clamping the plates.

It will be seen that I have provided a structure including a shouldered grooved foundation or bed in the form of a cylinder, a printing plate holder having a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated spring mechanism adapted to engage the shouldered structure of a groove for holding the jaw in relation to the bed, a double rack held in said groove, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

Certain features of construction herein shown are claimed in my Patent No. 934,249, issued September 14th, 1909, plate holders. and in my co-pending applications, Serial No. 283,651, filed October 20, 1905, printer's registering devices; and No. 308,121, filed March 26, 1906, printer's registering devices.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited to the precise construction shown, as changes may readily be made without departing from the spirit thereof, but,

Having thus described my invention, I claim as new and desire to secure by Letters-Patent the following:—

1. The combination with a grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated spring mechanism for holding the jaw in relation to the bed, a rack held in said groove with said base slidably connected to said rack, and means for propelling the plate holder in both directions by engagement with said rack.

2. The combination with a shouldered grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions by engagement with said rack.

3. The combination with a shouldered grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions by engagement with said rack.

4. The combination with a shouldered grooved foundation or bed in the form of a cylinder, of a printing plate holder includ-

ing a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated spring mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions by engagement with said rack.

5. The combination with a grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, mechanism for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

6. The combination with a grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated mechanism for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

7. The combination with a grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated spring mechanism for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

8. The combination with a shouldered grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

9. The combination with a shouldered grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

10. The combination with a shouldered groove foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to be passed down into a groove in said bed, a traveling plate-holding jaw coming above the foundation, automatically operated spring mechanism adapted to engage the shouldered structure of the groove, for holding the jaw in relation to the bed, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

11. The combination with a grooved foundation or bed in the form of a cylinder, of a printing plate holder including a base adapted to slide in a groove in said bed, a traveling jaw coming above the foundation, a double rack held in said groove, with said base slidably connected to said rack, and means for propelling the plate holder in both directions, said means including two pinions carried upon opposite sides of the base and in engagement with the double rack.

In witness whereof, I hereunto subscribe my name this 31st day of August A. D. 1907.

WALLACE S. WARNOCK.

Witnesses:
L. G. STROH,
G. L. CRAGG.