

Dec. 11, 1923.

1,476,927

F. A. SCHUMANN

AUTOMATIC ADJUSTABLE CYLINDER LAP

Filed Oct. 16, 1922

2 Sheets-Sheet 1

Fig. 1.

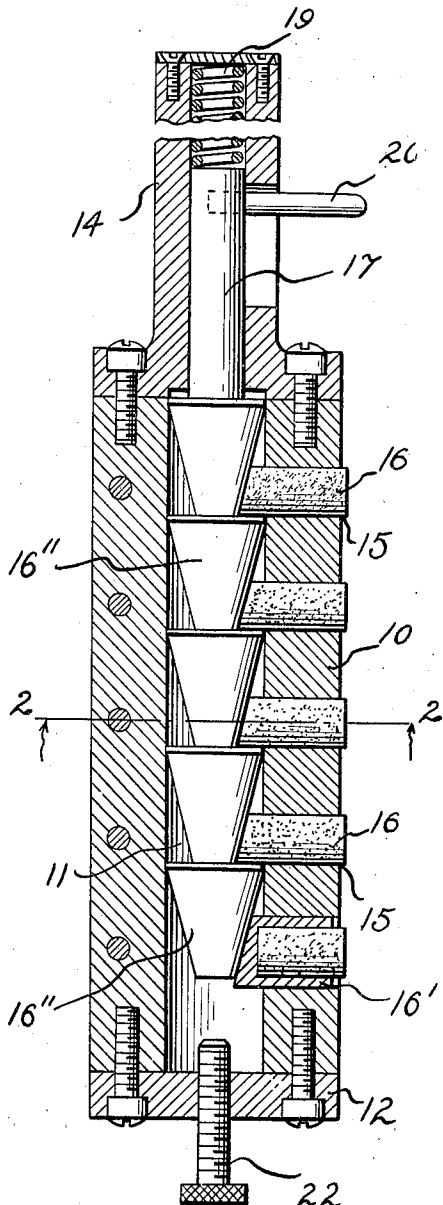


Fig. 3.

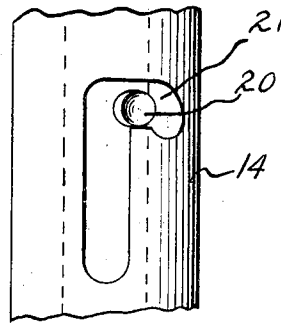


Fig. 2.

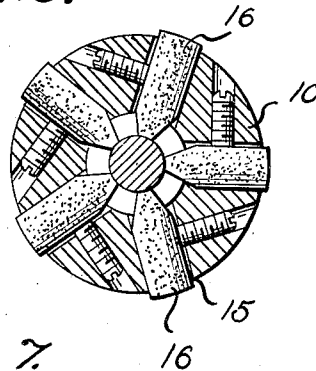
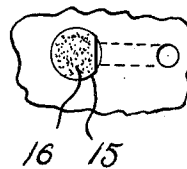


Fig. 7.



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AUTOMATIC ADJUSTABLE CYLINDER LAMP

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2 Sheets-Sheet 2

Fig. 4.

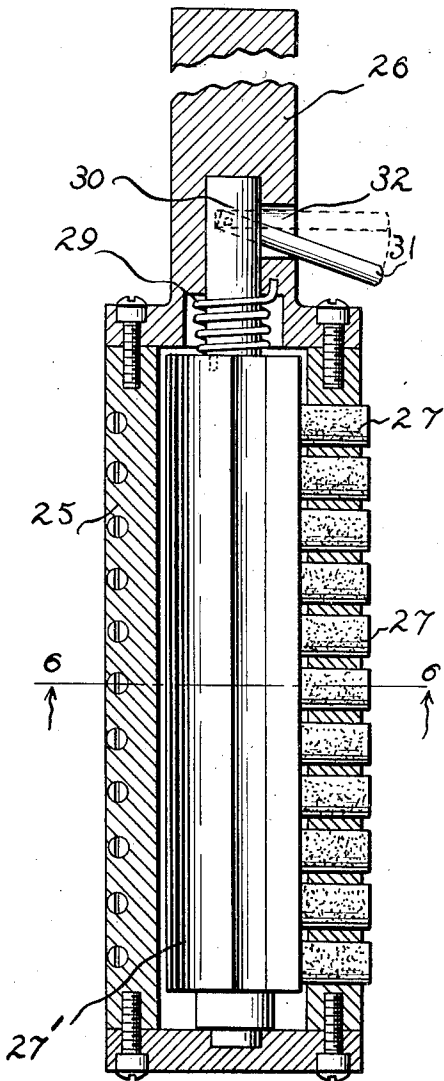


Fig. 5.

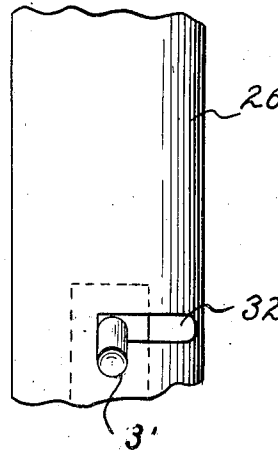
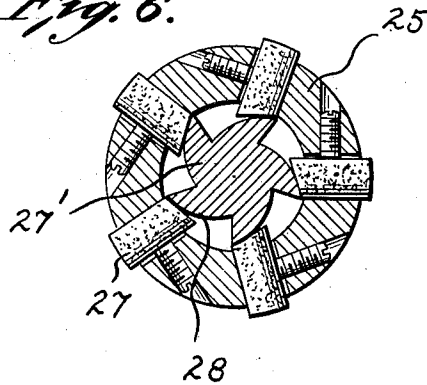


Fig. 6.



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AUTOMATIC ADJUSTABLE CYLINDER LAP.

Application filed October 18, 1922. Serial No. 594,915.

To all whom it may concern:

Be it known that I, FRANK A. SCHUMANN, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented new and useful Improvements in Automatic Adjustable Cylinder Laps, of which the following is a specification.

This invention has for its object the provision of a cylinder lapping tool, wherein use is made of a plurality of abrasive elements which are held in contact with the wall of the cylinder incident to the use of the tool, by means which automatically adjust said elements to compensate for any wear of the cylinder.

More specifically stated, the tool embodies a holder designed to accommodate the abrasive elements above referred to, and which elements are slidably associated with the tool and designed to cooperate with means including a yieldable member, which automatically projects the elements from the holder to maintain the elements in constant engagement with the wall of the cylinder incident to the use of the tool.

Another important object of the invention resides in the provision of means for regulating the tension of the yieldable member, and thereby limit the degree of movement of the abrasive elements.

The nature and advantages of the invention will be better understood when the following detailed description is read in connection with the accompanying drawings, the invention residing in the construction, combination, and arrangement of parts as claimed.

In the drawings forming part of this application, like numerals of reference indicate similar parts in the several views, and wherein:—

Figure 1 is a longitudinal sectional view through the tool constructed in accordance with one embodiment of the invention.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is an enlarged fragmentary view of the handle of the tool, showing the manner of locking the plunger against movement.

Figure 4 is a view similar to Figure 1, of a modified construction.

Figure 5 is a view similar to Figure 4 of a modified form.

Figure 6 is a sectional view taken on line 6—6 of Figure 4.

Figure 7 is a detail view showing the relation of the set screw with respect to the abrasive element and by this construction rotary movement of the abrasive elements is prevented.

Referring to the drawings in detail, and particularly Figures 1 to 3 inclusive, 10 represents the body of the tool which may be constructed from any suitable material and vary in size without departing from the spirit of the invention. The body is preferably of cylindrical formation in cross section, and provided with a longitudinal bore 11 to accommodate the plunger in a manner illustrated in Figure 1. The body 10 is open at one end, but normally closed by means of a plate 12 which is bolted or otherwise suitably secured to the body 10. The opposite end of the body is reduced, the reduced portion constituting a handle for the tool and represented at 14. The body 10 is provided with a plurality of openings 15, the openings being arranged in circular series, and provided to accommodate abrasive elements 16. These elements are slidably associated with the body 10, and are adapted to be projected therefrom into contacting engagement with the wall of the cylinders incident to the use of the tool. To prevent the abrasive elements from rotating, I provide the set screws 17' which are threadedly mounted in openings communicating with the openings 15 and said screws engage a flat surface longitudinally formed on the abrasive elements as shown in detail in Figure 7 of the drawings. If desired, each element can be fitted in a cup-like bushing 16 to obviate sticking or binding of the abrasive elements, it being of course understood that the bushings when used slide in the openings of the body portion. In accordance with the present invention, it is my purpose to provide means for automatically projecting the abrasive elements from the body of the tool, and thereby hold the abrasive element in constant engagement with the wall of the cylinder, while the tool is in use and thus compensate for any wear that may take place on the wall of the cyl-

inder. In carrying this idea into effect, I preferably employ a plunger which moves longitudinally within the body of the tool, the plunger being made up of a plurality of cone-shaped portions 16 arranged in end to end relation, the shank 17 of the plunger operating within the handle of the tool as illustrated.

Obviously, there is one of these cone-shaped portions for each abrasive element, and the inner extremity of said elements, or cup-shaped bushings when the latter are used to correspond with the taper of the cone-shaped portions of the plunger. Arranged within the handle is a yieldable member, preferably in the nature of a coiled spring indicated at 19, one end of which bears against the adjacent end of the plunger to move the latter in one direction through the body of the tool. A pin 20 projects from the shank of the plunger through a bayonet slot 21 formed in the handle, and when this pin is arranged in the short branch of the said slot, the plunger is held retracted against the tension of the yieldable element.

In practice, the tool is inserted within the cylinder to be dealt with, and the tool turned and reciprocated in the usual wellknown manner. The spring exerts a pressure on one end of the plunger to hold the cone-shaped portions in contact with the adjacent ends of the abrasive elements, and the latter are thereby automatically projected radially from the body of the tool and maintained in constant engagement with the wall of the cylinder, adjusting themselves to compensate for any wear of the cylinder. Carried by one end of the body 10 is an adjustable stop screw 22, which limits the movement of the plunger in one direction, and incidentally limits the degree of movement of the abrasive elements. The screw is further utilized to regulate the tension of the yieldable member.

In Figures 4 to 6 inclusive, I have illustrated a modified form of the invention, wherein the body of the tool is indicated at 25, and is of the same general construction as the body portion 10 above described, the handle for the tool being indicated at 26. The abrasive elements 27 are slidably associated with the body portion, and are arranged in circular series as shown. This form of the invention varies from the preferred form in the means utilized for automatically projecting the abrasive elements from the body of the tool and holding them in constant engagement with the wall of the cylinder. The means employed in this form of the invention consists of a plunger 27, which has associated therewith a plurality of cams 28, the latter being arranged in circular series on the plunger, one cam

being provided for each of the abrasive elements. The inner ends of the abrasive elements are bevelled to correspond to the active surface of the cams. A coiled spring 29 surrounds the shank 30 of the plunger, and has one end secured thereto, and the other end secured to the body of the tool. This spring is tensioned to normally tend to rotate the plunger in one direction, thereby moving the cams in the proper direction to project the abrasive elements from the body of the tool for the purpose stated. Carried by the shank 30 of the plunger and pivotally associated therewith is a pin 31, which projects through a bayonet slot 32 in the handle of the tool, the pin when arranged in one portion of the slot holds the plunger against movement under the influence of the spring.

While it is believed that from the foregoing description, the nature and advantages of the invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described, and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What I claim is:—

1. A cylinder lapping tool comprising a body portion having a longitudinal bore, a handle arranged at one end of the body portion, a plurality of abrasive elements radiating from the body portion, and slidably associated therewith, a plunger movable within the body portion and designed to engage the abrasive elements and automatically project them from the body portion into constant engagement with the wall of the cylinder incident to the use of the tool, and yieldable means for exerting pressure on said plunger for the purpose specified.

2. A cylinder lapping tool comprising a body portion having a longitudinal bore, a handle for the tool, a plurality of abrasive elements arranged in circular series on said body portion, and slidably associated therewith, a plunger movable in the bore of said body portion and including a plurality of conical-shaped portions contacting the adjacent extremities of said abrasive elements, yieldable means for moving the plunger in one direction to automatically project the abrasive element from said body portion and hold them in constant engagement with the wall of the cylinder, incident to the use of the tool, and means for holding said plunger in a restricted position.

3. A cylinder lapping tool comprising a body portion having a longitudinal bore, a plurality of abrasive elements radiating from the body portion and slidably associated therewith, a plunger movable within the bore of the body portion, cams carried by the plunger for contact with the adja-

cent ends of the abrasive elements, yield-
able means associated with said plunger and
rotating the latter in one direction, where-
by said abrasive elements are automatically
projected from the body portion and held
in constant engagement with the wall of
the cylinder, incident to the use of the tool,
and means for holding the plunger immov-
able against the influence of said yieldable
means.

In testimony whereof I affix my signature.

FRANK A. SCHUMANN.