

W. E. YORK & G. D. HAYDEN.
ADJUSTABLE REAMER.
APPLICATION FILED MAY 6, 1909.

972,139.

Patented Oct. 4, 1910.
3 SHEETS-SHEET 1.

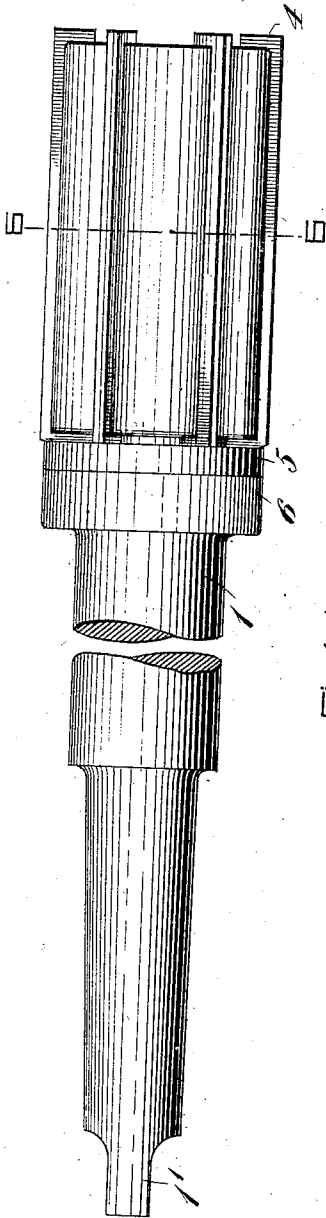


FIG. 1-

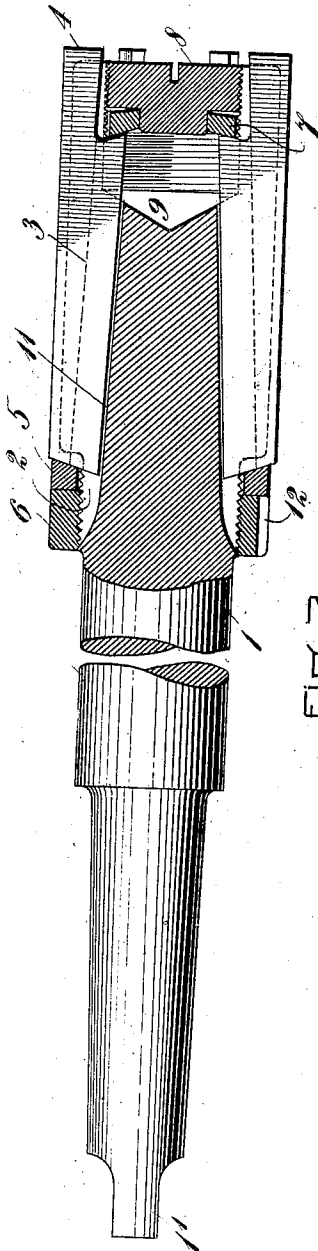


FIG. 2-

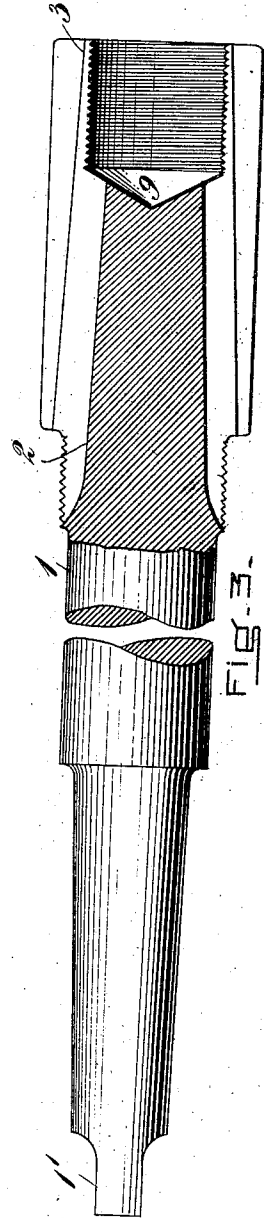


FIG. 3-

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3 SHEETS—SHEET 2.

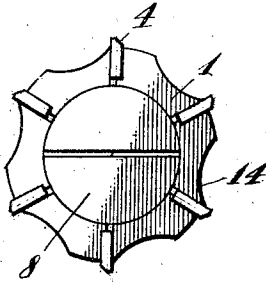


Fig. 4.

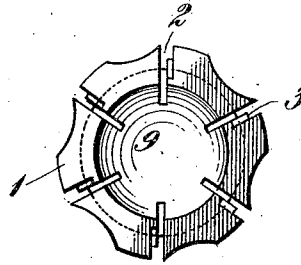


Fig. 5.

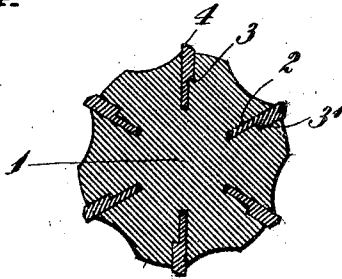


Fig. 6.

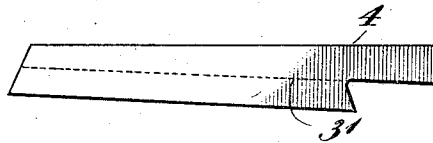


Fig. 7.



Fig. 8.

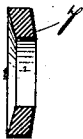


Fig. 9.



Fig. 10.

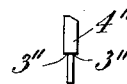


Fig. 8.a

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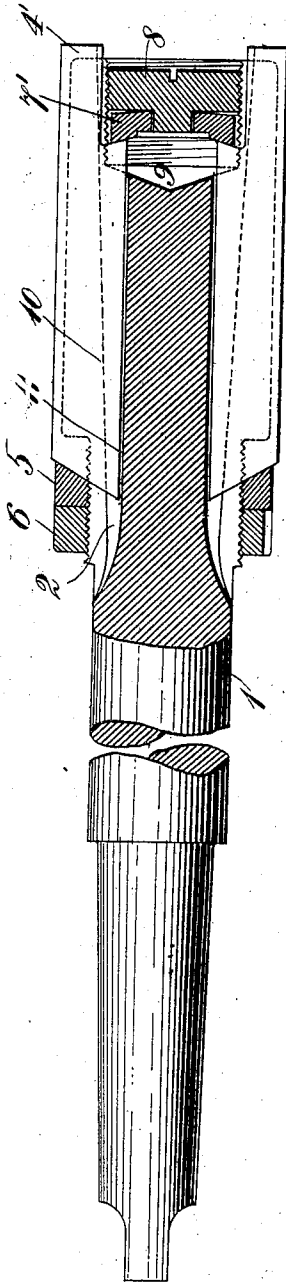


FIG. 11.

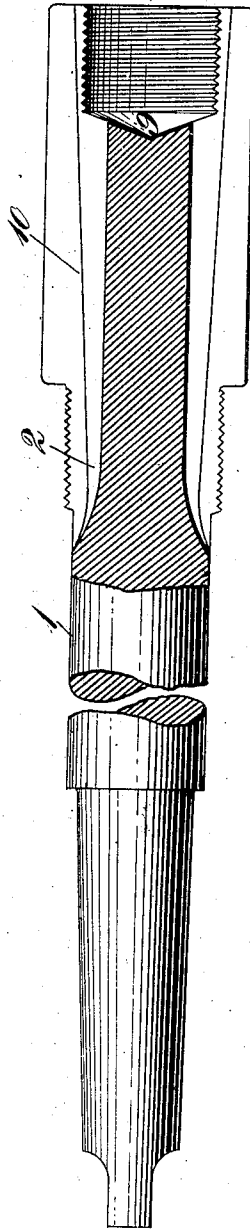


FIG. 12.



FIG. 13.

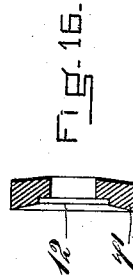


FIG. 14.



FIG. 15.

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE REAMER.

972,139.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed May 6, 1909. Serial No. 494,499.

To all whom it may concern:

Be it known that we, WILLIAM E. YORK and GEORGE D. HAYDEN, citizens of the United States, and residents of New Bedford, in the county of Bristol and State of Massachusetts, have invented a new and useful Improvement in Adjustable Reamers, of which the following is a specification.

Our invention relates to adjustable reamers and its object is to improve the construction of such reamers in the manner hereinafter set forth whereby their solidity may be increased and their gage conveniently and accurately varied.

Our invention will be described with reference to the drawings which accompany and form a part of this specification, in which—

Figure 1 is a side elevation of our adjustable reamer, Fig. 2 is a longitudinal section thereof showing particularly the manner of securing the blades to the stock, Fig. 3 is a longitudinal section of said stock, Fig. 4 is an end view of the reamer shown in Fig. 1, Fig. 5 is an end view of the stock shown in Fig. 3, Fig. 6 is a transverse section taken on the line 6—6 of Fig. 1, Fig. 7 is a side view of one of the blades, Fig. 8 is an end view of the blade shown in Fig. 7, Fig. 8^a is an end view of a modified form of blade, Fig. 9 is a central section of the collar at the forward end of the reamer, Fig. 10 is a side view of the adjusting screw which coöperates with said collar, Fig. 11 is a longitudinal section of a modified form of reamer embodying our invention, Fig. 12 is a central section of the stock shown in Fig. 11, Fig. 13 is an end view of said stock before the blades have been inserted therein; Fig. 14 is a side view of the blade used in said modified type of reamer, Fig. 15 is an end view of said blade, and Fig. 16 is a central section of the collar at the forward end of the reamer shown in Fig. 11.

In the drawings selected for illustrating the particular embodiments of our invention herein disclosed, 1 represents the reamer stock which, as shown, is provided with a tapered end terminating in a tang 1' for securing the same in the socket of the machine in which it is employed. The surface of the stock is provided with a plurality of longitudinal and radial slots 2, herein shown as six in number, and each slot is provided with a longitudinally extending shoulder 3. A blade 4 is located in each slot and is pro-

vided with a longitudinally extending shoulder 3', the said shoulders being inclined with respect to the axis of the stock in reverse direction, so that when the shoulder on the blade rests upon the shoulder in the slot, the cutting portion of the blade is parallel with the axis of the slot. Inasmuch as the blades do not extend to the bottom of the slots, it will be seen that each blade is supported longitudinally solely by the said shoulders. For securing the blades against longitudinal and radial movement we employ the collar 5 having a beveled edge coöperating with the rearward beveled edge of each blade, said collar being interposed between the blade and the lock-nut 6 which is screw-threaded to the stock at the rear end thereof. The forward end of the stock is provided with a chamber 9 which is threaded to receive the screw 8, and a washer 7 is interposed between said screw and a beveled portion on the under side of each blade near the forward end thereof, the washer being beveled to coöperate with said beveled portion of each blade.

If desired, the blade 4' having two longitudinally extending shoulders 3'', 3''' as shown in Fig. 8^a, may be employed, and in such case the slots will each be provided with corresponding coöperating shoulders.

When it is desired to increase the gage of the reamer, the lock-nut 6 is loosened and the screw 8 is turned in such direction as to move the blades toward the rear of the reamer,—for example, if the screw be a right-hand screw, it is turned to the right. Each blade then moves radially outward until the rear ends of each blade meet the collar 5 whereupon the screw is tightened and the blades locked in position. When it is desired to decrease the gage of the reamer, the screw is turned in the opposite direction and the lock-nut 6 turned in such direction as to simultaneously force the blades longitudinally forward until the beveled portion on the under side of each blade near the forward ends thereof engages the washer 7, whereupon the lock-nut 6 is tightened and the blades secured in position.

In the modification shown in Fig. 11, the slots are provided with shoulders 10 inclined rearwardly with respect to the axis of the stock, and each blade 4' is provided with a correspondingly inclined shoulder 10', the shoulders being so arranged that when they

are in engagement the cutting edge of each blade is parallel with the axis of the reamer. In this case the washer 7', which engages with the beveled portion near the forward edge of each blade, may be counterbored as shown at 12 to provide for increased adjustment in the gage of the reamer. The operation of altering the gage of the reamer shown in Fig. 11 is exactly the reverse of that above described in connection with the reamer shown in Fig. 1 as will be apparent.

It will be understood that the stock may have any suitable shape and that surfaces of the portions thereof between adjacent blades may be straight as shown at 13 in Fig. 13, or scalloped as shown at 14 in Fig. 4.

It will be noted that the blades do not rest upon the bottom of the slots and that there is always a space, shown at 11, between the bottom of the blades and the top of said slots.

One of the advantages of the construction hereinbefore described is that the forward ends of the blades project beyond the forward end of the stock so that the reamer may be employed to the extreme depth of a bore.

It will be understood that various modifications may be made in the two embodiments of our invention herein described without departing from the spirit thereof.

We claim:

1. In an adjustable reamer, a stock provided with longitudinal and radial slots having parallel walls, each slot having a longitudinally extending rectangular shoulder inclined with respect to the axis of said stock, a blade having parallel sides, such a blade being located in each slot but not extending to the bottom thereof and having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the axis of the stock being the reverse of that of the shoulder of the slot, whereby each blade is supported longitudinally solely by the shoulder of its slot, means for securing each blade to said stock and means whereby the blades may be simultaneously moved radially and longitudinally.

2. In an adjustable reamer, a stock provided with longitudinal and radial slots having parallel walls, each slot having a longitudinally extending rectangular shoulder inclined with respect to the axis of said stock, a blade having parallel sides, such a blade being located in each slot but not extending to the bottom thereof and having its forward cutting portion projecting beyond the forward end of said stock, each blade having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the longitudinal axis of the stock being the reverse of that of the shoulder of

the slot, whereby each blade is supported longitudinally solely by the shoulder of its slot, means for securing each blade to said stock and means whereby the blades may be simultaneously moved radially and longitudinally.

3. In an adjustable reamer, a stock provided with longitudinal and radial slots having parallel walls, each slot having a longitudinally extending rectangular shoulder inclined with respect to the axis of said stock, a blade having parallel sides, such a blade being located in each slot but not extending to the bottom thereof and having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the longitudinal axis of the stock being the reverse of that of the shoulder of the slot, whereby each blade is supported longitudinally solely by the shoulder of its slot, a lock-nut threaded on the rear portion of the stock, a beveled collar interposed between said nut and the rear end of each blade and engaging the corresponding beveled ends of said blades, and means whereby the blades may be simultaneously moved radially and longitudinally.

4. In an adjustable reamer, a stock provided with longitudinal and radial slots having parallel walls, each slot having a longitudinally extending rectangular shoulder inclined with respect to the axis of said stock, a blade having parallel sides, such a blade being located in each slot but not extending to the bottom thereof and having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the longitudinal axis of the stock being the reverse of that of the shoulder of the slot, whereby each blade is supported longitudinally solely by the shoulder of the slot, means for securing each blade to said stock, said means comprising a screw threaded in a chamber in the front end of said stock and a beveled washer interposed between said screw and a correspondingly beveled portion of the blades near the front ends thereof, said washer engaging said beveled portion of each blade.

5. In an adjustable reamer, a stock provided with longitudinal and radial slots having parallel walls, each slot having a longitudinally extending rectangular shoulder inclined with respect to the axis of said stock, a blade having parallel sides, such a blade being located in each slot but not extending to the bottom thereof and having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the longitudinal axis of the stock being the reverse of that of the shoulder of the slot, whereby each blade is supported longitudinally

nally solely by the shoulder of its slot, a lock-nut threaded on the rear portion of the stock, a beveled collar interposed between said nut and the rear end of each blade and engaging the correspondingly beveled ends of said blades, a screw threaded in a chamber in the front end of said stock, and a beveled washer interposed between said stock and a correspondingly beveled portion of the blades near the front ends thereof, said washer engaging said beveled portions of each blade.

6. In an adjustable reamer, a stock provided with longitudinal and radial slots, each slot having a longitudinally extending shoulder inclined with respect to the axis of said stock, a blade located in each slot but not extending to the bottom thereof and having a shoulder corresponding to and cooperating with the shoulder of the slot, the inclination of the shoulder of the blade with respect to the longitudinal axis of the stock being the reverse of that of the shoulder of the slot, whereby each blade is supported longitudinally solely by the shoulder of the slot, means for securing each blade to said stock, said means comprising a screw thread-

ed in a chamber in the front end of said stock and a beveled washer interposed between said screw and a correspondingly beveled portion of the blades near the front ends thereof, said washer engaging said beveled portion of each blade and being counter-bored to provide for increased adjustment in the gage of the reamer.

7. In an adjustable reamer, a blade having parallel sides and provided with a longitudinally extending rectangular shoulder inclined to the cutting edge of said blade.

8. In an adjustable reamer, a blade having parallel sides and provided with a longitudinally extending rectangular shoulder inclined to the cutting edge of said blade, the under side of the forward end of said blade being provided with a beveled portion.

In testimony whereof, we have hereunto subscribed our names this 3d day of May 1909.

WILLIAM E. YORK.
GEORGE D. HAYDEN.

Witnesses:

FRED M. REID,
WILLIAM T. READ.