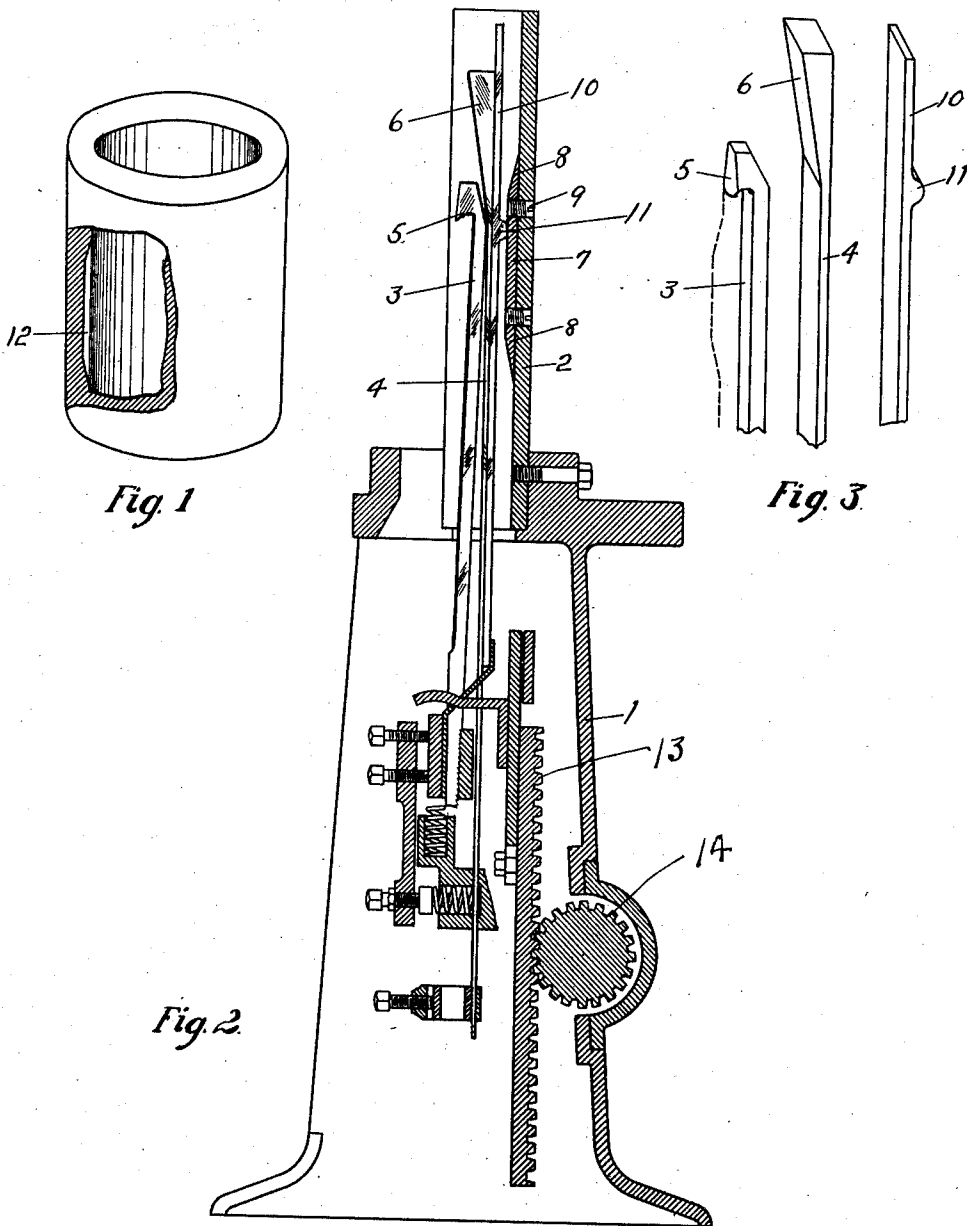


P. S. MITTS.
OIL GROOVE CUTTING ATTACHMENT FOR KEY SEATING MACHINES.
APPLICATION FILED SEPT. 16, 1911.

1,025,152.

Patented May 7, 1912.



WITNESSES:
Jos. Rawley
Christine A. Braidel

Philip S. Mitts INVENTOR
BY
Geo. B. Wilcox ATTORNEY

UNITED STATES PATENT OFFICE.

PHILIP S. MITTS, OF SAGINAW, MICHIGAN.

OIL-GROOVE-CUTTING ATTACHMENT FOR KEY-SEATING MACHINES.

1,025,152.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed September 16, 1911. Serial No. 649,769.

To all whom it may concern:

Be it known that I, PHILIP S. MITTS, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Oil-Groove-Cutting Attachments for Key-Seating Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is an oil groove cutter, especially adapted for cutting oil grooves or scores in the bore of a hub, such as the hub of a wheel which is to run loose on its shaft.

My improvement is also adapted for cutting grooves in many other articles in which long scores or recesses are required.

The improvement pertains more particularly to a device adapted to be attached to key-seating machines of the type in which the cutting tool travels through a vertical stroke.

The particular object of my present improvement is to provide in such a key-seating machine means whereby, during the vertical stroke of the cutting tool, the tool is projected laterally into the work during a part only of the down-stroke of the tool so that the groove or score cut by the tool does not extend the full length of the bore of the piece being operated upon, but begins at any desired distance from one end of the bore, and terminates before the tool reaches the other end of the bore.

My improved device also embodies means for gradually feeding the tool into the work at the beginning of the cut and to gradually withdraw it toward the end of the cut, so that the two extremities of the finished groove taper out gradually, instead of extending clear through from end to end of the bore, as is the case with an ordinary key-seating machine having no means such as will be described in this specification, for gradually feeding the tool forward and gradually retracting it during the downward stroke of the tool.

My improvement also provides means for varying the length of the groove and for varying its location with respect to the ends of the hub.

With these and certain other objects in

view which will appear later in the specification, my invention consists in the devices to be described and claimed, and the equivalents thereof.

In the drawings forming a part of the specification, Figure 1 is a side view broken away in part, showing a hub having an internal oil groove such as is produced by a key-seater equipped with my improvement; Fig. 2 is a part vertical sectional view of a key-seater with my improvement attached; and Fig. 3 is a perspective view showing the upper ends of the cutting tool, the feed wedge bar, and the tool-feeding bar.

As is well known, the ordinary key-seating machine comprises a frame 1 which carries a vertical post 2 and is provided with a vertically movable tool bar 3.

In the particular type of key-seater to which my present invention is especially adapted, there is also provided a vertically movable feeding wedge bar 4. The tool bar 3 is equipped with a cutting tool 5 at its upper end and is adapted to be reciprocated up and down by any suitable driving mechanism.

A rack or cross-head 13, actuated up and down by a pinion 14 is preferably employed to impart the required movement to the cutting tool, the connections between cross-head 13 and the cutter bar being of usual construction and well known in the art. It will, however, be understood that as the cutting tool 5 of the ordinary key-seating machine moves downward, it is backed by the wedge 6 at the upper end of the wedge bar 4. While the tool 5 is at the upper end of its travel, the wedge 6 is first drawn down slightly, forcing the tool 5 laterally away from post 2 to feed it into the work. Tool 5 and wedge 6 then travel down to the bottom of the stroke, after which wedge 6 is slightly raised, allowing tool 5 to draw back slightly out of the cut and giving it clearance on the up-stroke. At the beginning of any succeeding down-stroke, the wedge 6 is fed down farther, feeding the tool 5 still farther into the work and giving it the proper feed for the second cut. It will be noted, however, that such a key-seating device is capable only of cutting a key-seat throughout the entire length of the bore of the hub, so that the ends of the key-seat are open. In many classes of work, as for in-

stance in the fitting up of wheels which are to run loose on their shafts, it is desirable to provide internal oil grooves that do not extend the entire length of the hub, but terminate short of the ends. To accomplish this result it is essential that the forward feed of the cutting tool be produced in the same manner as has just been described, that is, by the proper operation of the wedge 6, but in addition it is also necessary to provide an independent means by which the tool 5 may be thrown forward after it has completed the first part of its travel down the bore of the hub, and that means shall also be provided for withdrawing the tool before it has traveled completely through the hub.

My improvement, therefore, embodies means for throwing the tool forward during a part of its stroke in the manner above indicated. The means by which this is accomplished is illustrated in Figs. 2 and 3, in which 7 is a cam plate beveled at its upper and lower ends, as indicated at 8. This cam plate is secured to the post 2 in any suitable manner, as by screws or bolts 9. At the back of wedge 6 is provided a bar 10 which is vertically movable and is connected at its lower end to tool bar 3, so as to move up and down simultaneously with the cutting tool 5. At the back of bar 10 is a suitable projection 11 adapted to ride over the ends 8 and along the face of the plate 7, as indicated in Fig. 2.

In practice I prefer to locate projection 11 in the rear of but very slightly below the cutting point of tool 5, so that the rearward thrust of the cutting tool will be transmitted directly through projection 11 to the plate 7. The vertically movable feed wedge bar 4 with its wedge 6 is interposed between the tool bar 3 and the backing bar 10, so that vertical adjustment of the wedge 6 may be had in the same manner as is now common in key-seating machines.

It will be understood that at the commencement of the down-stroke of tool 5, wedge 6 is drawn down a distance corresponding to the desired feed to be given to the tool 5, and tool 5, wedge 6 and bar 10 with its projection 11 then travel down simultaneously until projection 11 encounters the beveled end 8 of plate 7, when bar 10, wedge 6 and tool 5 are projected outwardly and tool 5 takes into the work, cutting on its down-stroke until the lower bevel 8 of plate 7 is reached and the tool gradually withdraws from the work. The form of groove thus cut is indicated at 12 in Fig. 1, in which it will be noticed that the completed groove has gradually tapered ends that do not extend to the ends of the piece in which the groove is cut.

In practice I prefer to provide a number of plates 7 which may be interchangeably

secured to the post 2, the plates being of different lengths, and if desired, of different faced contour in order to cut grooves of different lengths. By tapering the working face of plate 7, the bottom of groove 12 may be tapered if desired, or various shapes may be imparted to the groove by properly shaping the face of plate 7. The line of travel of the point of the cutting tool 5 when acted upon by plate 7 is indicated by dotted lines in Fig. 3.

By the means above described I have produced a simple, yet inexpensive attachment that can be applied to existing key-seating machines, whereby it is possible to cut a variety of grooves of different kinds in the interior surface of a hub, the ends of the grooves not extending to the ends of the hub.

The work can be done with extreme rapidity and accuracy.

While I have shown and described the device as applied particularly to the cutting of concealed oil grooves in the interior of hubs, it will be understood that this example was selected for purpose of explanation only and that the machine is capable of a wide range of uses which will be apparent to the users of such machines.

Having described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In combination with a key-seating machine having a vertically movable cutting tool, a vertical post adjacent said tool, and means for actuating said tool lengthwise said post, and for feeding it progressively into the work, means for projecting said tool forward during the middle portion of its cutting stroke, said means comprising a plate formed with tapered ends and removably mounted on the face of said post and at the rear of the middle portion of the travel of the cutting tool, and a projecting member located between the cutting tool and said plate, and adapted to travel with the cutting tool, said projecting member adapted to engage the working face of said plate.

2. In combination with a key-seating machine having a vertically movable cutting tool, a vertical post adjacent said tool, and means for actuating said tool and for feeding it progressively into the work; independent means for projecting said tool forward during the middle portion of its cutting stroke, said means comprising a cam plate removably secured to the face of said post, and a vertically movable backing bar located at the rear of said cutting tool and having a rearward projection slidably engaging the face of said cam plate.

3. In a key-seating machine, the combination with a vertically movable tool-carrying bar and a vertically movable feeding wedge bar having a wedge at its upper end, and means for actuating said bars, of a

stationary vertical post, a cam plate remov-
ably secured to said post adjacent said tool,
a vertically movable backing bar secured to
said tool-carrying bar, said backing bar
5 formed with a projection adapted to engage
said cam plate during a portion only of the
vertical travel of said backing bar.

In testimony whereof, I affix my signature
in presence of two witnesses.

PHILIP S. MITTS.

Witnesses:

CHRISTINE A. BRAIDEL,
GEO. W. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."