No. 897,041. PATENTED AUG. 25, 1908.

B. M. WELLER.

COMBINED FACING TOOL AND COUNTERBORE.

APPLICATION FILED FEB. 23, 1907.

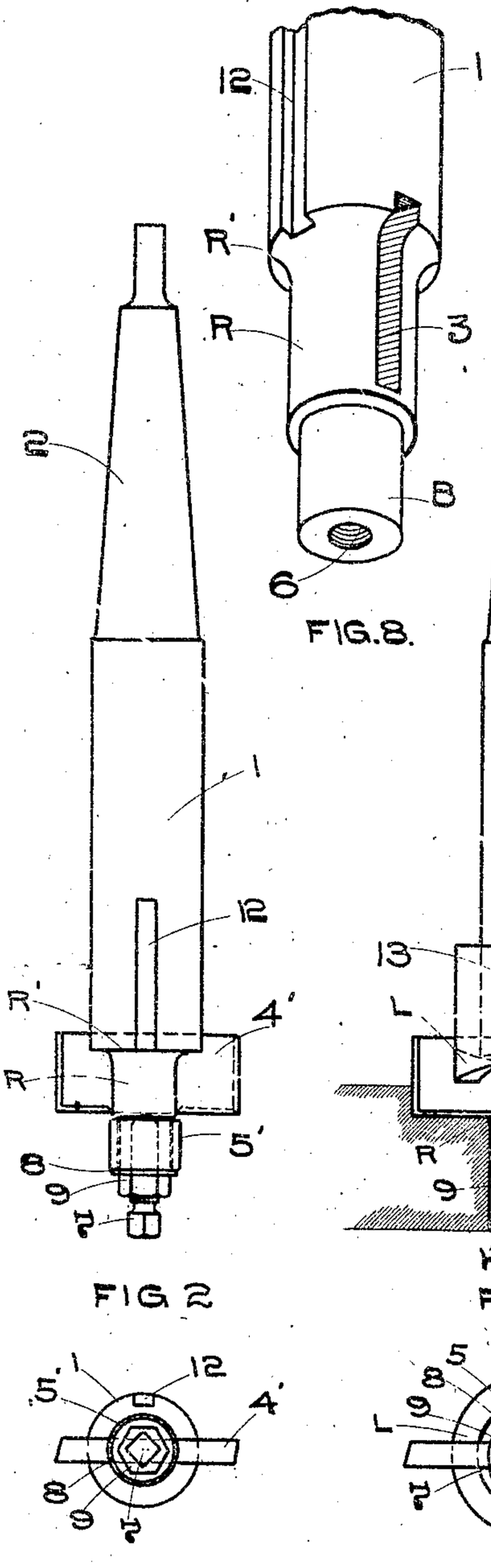

FIG. 8. FIG. 2

FIG. 1.

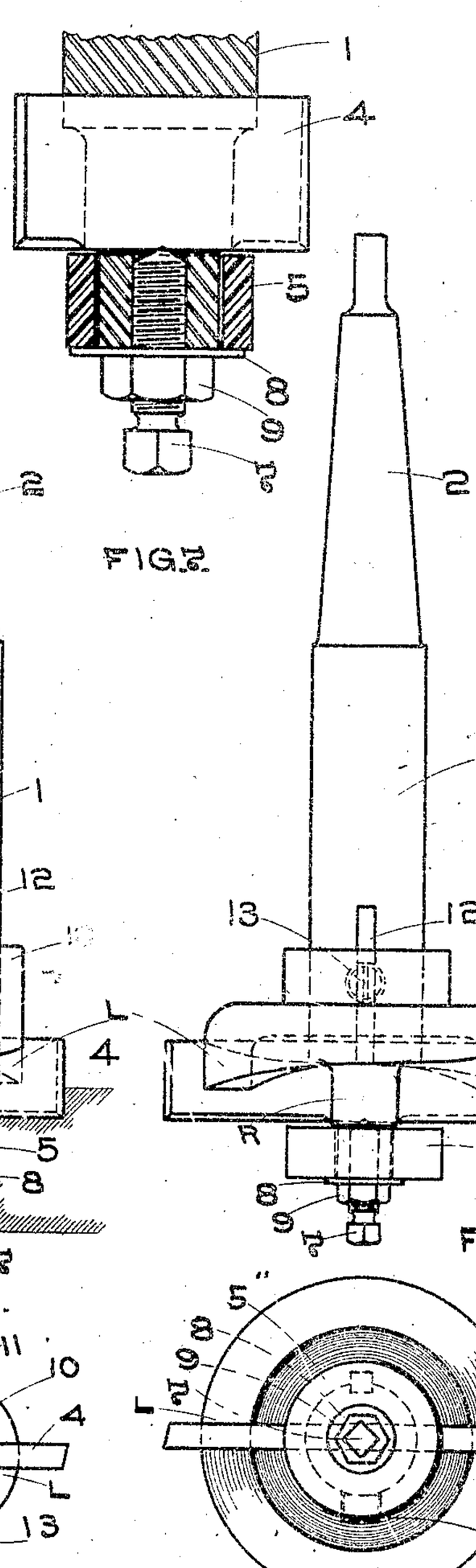

FIG. 2. FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

Witnesses

Gilson Shaffer

Laura D. Inman

Inventor

Byron M. Weller

By Edward R. Brown

Attorney

UNITED STATES PATENT OFFICE.

BYRON M. WELLER, OF FRANKLIN, PENNSYLVANIA.

COMBINED FACING-TOOL AND COUNTERBORE.

No. 897,041. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed February 23, 1907. Serial No. 358,329.

To all whom it may concern:

Be it known that I, BYRON M. WELLER, citizen of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in a Combined Facing-Tool and Counterbore, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to an improved counter-bore and facing tool, the construction and operation of which is herein fully set forth, reference being had to the accompanying drawings which form a part hereof, and in which:—

Figure 1 is an elevation of the usual form of my device. Fig. 2 is an elevation of the same without the reinforcing collar. Fig. 3 is an elevation of same with a long cutter and an enlarged reinforcing collar or sleeve. Figs. 4, 5 and 6 are end views. Fig. 7 is a vertical section of the lower portion of the arbor and the pilot-bushing, showing the cutter in elevation. Fig. 8 is a perspective view of the lower end of the arbor.

The construction of my improved counterbore and facing tool is substantially as follows:

I construct an arbor 1, which is provided upon its upper end with a suitable shank 2, adapted to the purpose of holding and driving the tool. The lower end is preferably reduced in diameter at R, for the purpose of enabling the tool to operate upon areas smaller than the area of the arbor 1, through said reduced portion R, is formed a slot 3 for the reception of cutters 4, 4′ and 4″; said slot 3 extends upward a short distance beyond the shoulder R′ for the purpose of forming a more extended bearing upon the upper edge of the cutter.

Below reduction R, is formed a pilot point or bearing B, for the reception of the pilot bushing 5, which is revolubly mounted upon said point: Extending longitudinally through point B, and into the cutter-slot 3 is a tapped hole 6, for the reception of a set-screw 7, the upper point of which bears against the lower edge of the cutter and secures the same in position.

The pilot bushing 5—of which there may be various sizes 5′, 5″—is retained upon the point B by the washer 8 and nut 9, which nut screws upon the set-screw 7 and serves as a lock nut thereto; the diameter of bushing 5 may vary, as aforesaid, to suit the size of the hole H, (Fig. 1) which the pilot is required to enter to fill.

Upon the arbor 1 is mounted a reinforcing sleeve 10 or 10′, the lower edge of which is formed into spiral lips L, L, the long vertical faces of which bear respectively against the back side of each end of the cutter to "back it up" or strengthen it against the cutting or working strain.

In this construction, by using a properly proportioned sleeve, it becomes possible to use long cutters in a comparatively small arbor, as shown in Fig. 3. Said sleeves are made non-revoluble upon arbor 1, by securing a feather 11 in the interior wall of the sleeve, adapted to occupy the seat 12. The sleeves are adapted to have a certain amount of longitudinal adjustment upon the arbor, and to secure said sleeve at the proper position of said longitudinal adjustment, a set-screw 13 passes through said sleeve, at the side opposite to feather 11, and bears against the arbor. When the cutter becomes narrow, from grinding, it becomes necessary to raise the sleeve, so that the lips L will not project below the cutting edge of the cutter; the object of the longitudinal adjustment of said sleeve 10 is thus obvious.

In order to effectually prevent a chattering or vibration of the tool 4, it is necessary that that portion of the reinforcing sleeve 10 which bears against the back side of said tool, should extend down into close proximity to the cutting edge of the tool: If, however, said sleeve were made straight across the lower face, the accumulation of chips or borings beneath the same, especially in the form shown in Fig. 3, would materially interfere with the work of the tool, and it is for the purpose of overcoming this difficulty that the lower face of sleeve 10 is made spiral, and which constitutes an essential feature of my invention.

In tools of this type, the work to be done is of the character shown in Fig. 1, that is, the material surrounding holes of a comparatively small diameter, is to counterbored or spot-faced at one or both ends of the hole, and in order to have the counterbore or spot-facing concentric with said hole, there must be a pilot upon the end of the tool to enter and fit said hole (H) closely.

In tools, as at present constructed, the pilot is integral with the arbor and revolves in the hole, and it is a common occurrence

with such a pilot, for the chips to work down around the periphery of same and cause it to stick, which strains the arbor and some times breaks the pilot; this also interferes with the proper working of the cutters. With my construction, the pilot-bushing does not revolve in the hole, and, therefore, is not subject to the conditions and objections above stated, hence, it is much easier to operate, and all torsion, incident to driving the usual form of pilot, is eliminated, which is especially advantageous, when it is considered that such torsion must largely be sustained by the reduced portion R of the arbor. It is also obvious that the reinforcing sleeve 10 will relieve said reduced portion R of all strain incident to driving the cutter, hence it will be readily understood that the reinforcing sleeve and the revoluble pilot-bushing coöperate to eliminate the torsion upon said reduction R, hence said reduction may be smaller than in the usual form of tool, and the limit of working area of my tool becomes much greater, than in the usual form of counterbore. This is a valuable feature of my invention; for the reason that one arbor of my construction, will cover a range of work that it has heretofore required several arbors to accomplish.

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

In a combined counter-bore and facing tool, an arbor having a shank at one end thereof, there being a cutter-slot through said arbor approximate to the other end, a cutter in said slot, a reinforcing sleeve non-revolubly mounted upon said arbor, there being spiral lips upon said sleeve, each lip having a vertical face adapted to bear against the back side of the respective ends of said cutter for the purpose specified.

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

BYRON M. WELLER.

Witnesses:
WM. F. WAGNER,
FRANK CRISSU.