No. 765,877. PATENTED JULY 26, 1904.

B. BROWNSTEIN.

BORING AND REAMING TOOL.

APPLICATION FILED MAR. 1, 1904.

NO MODEL.

Fig. 1

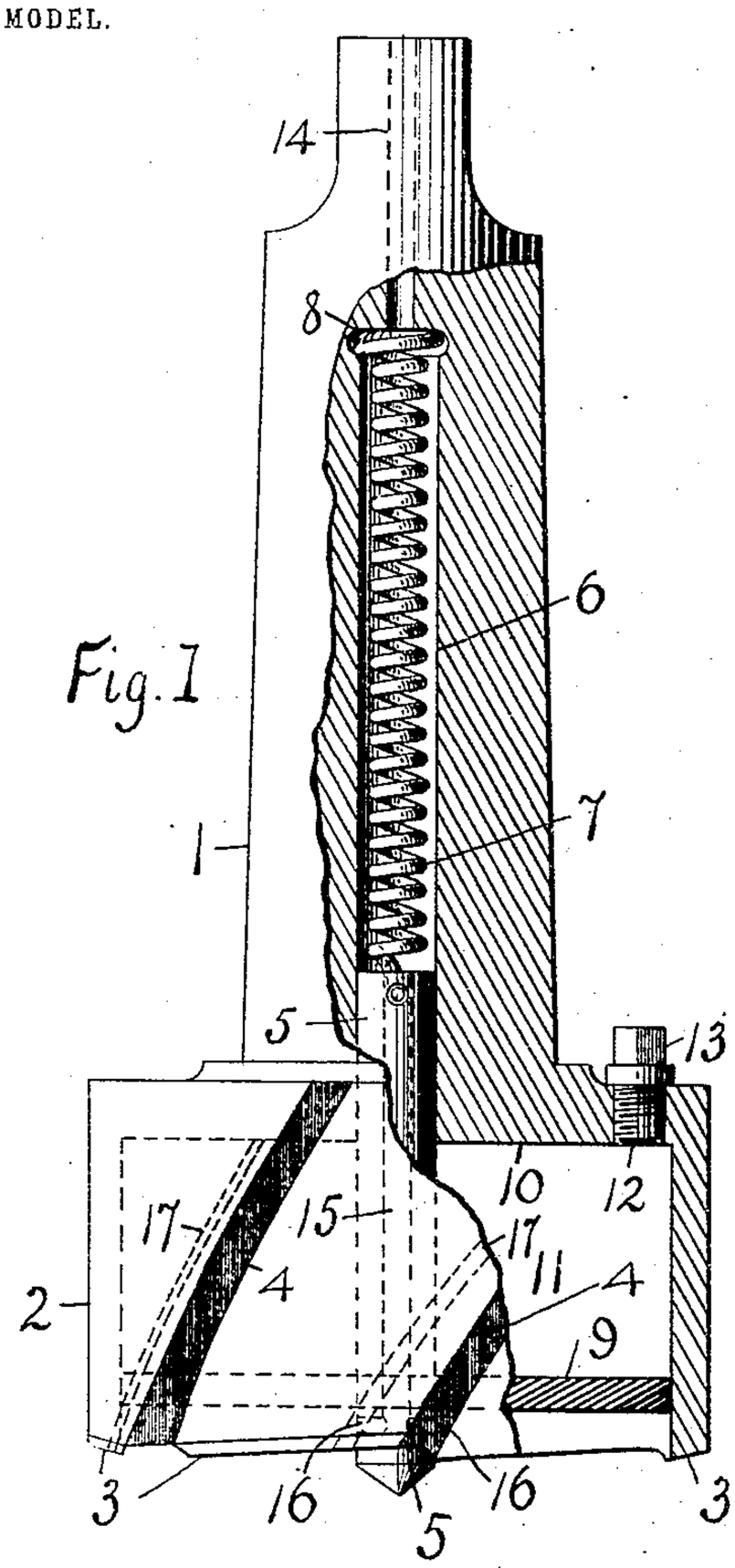
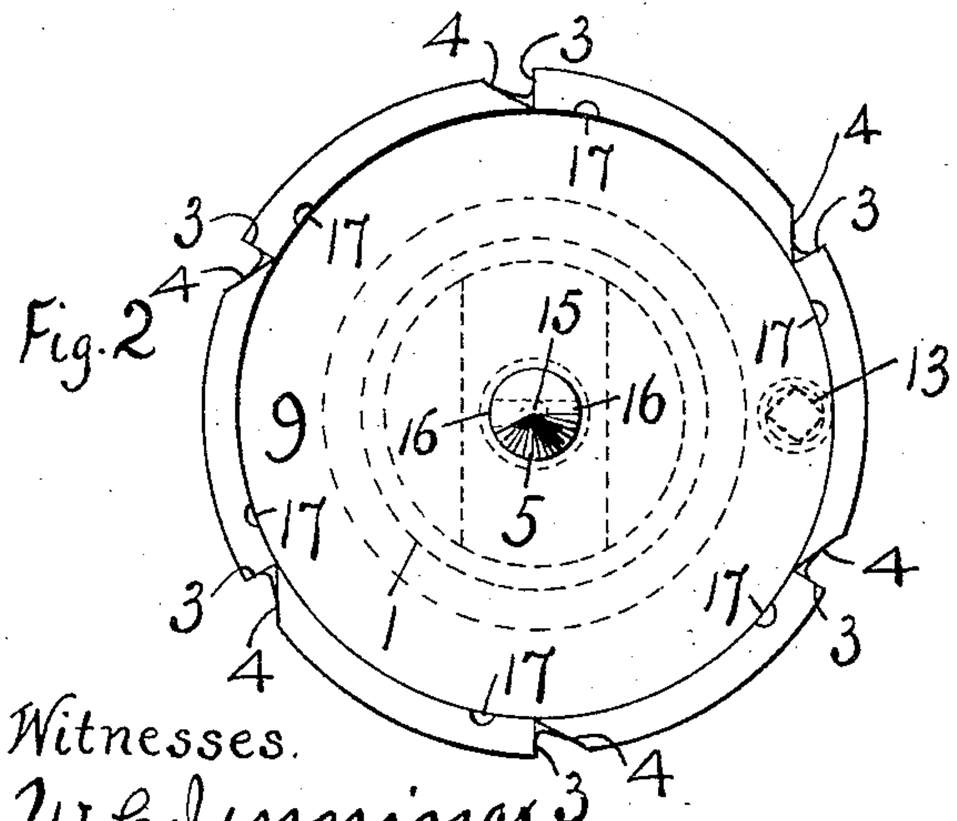


Fig. 2



Witnesses.
W. C. Jennings.
Henry T. Colvin

Fig. 3

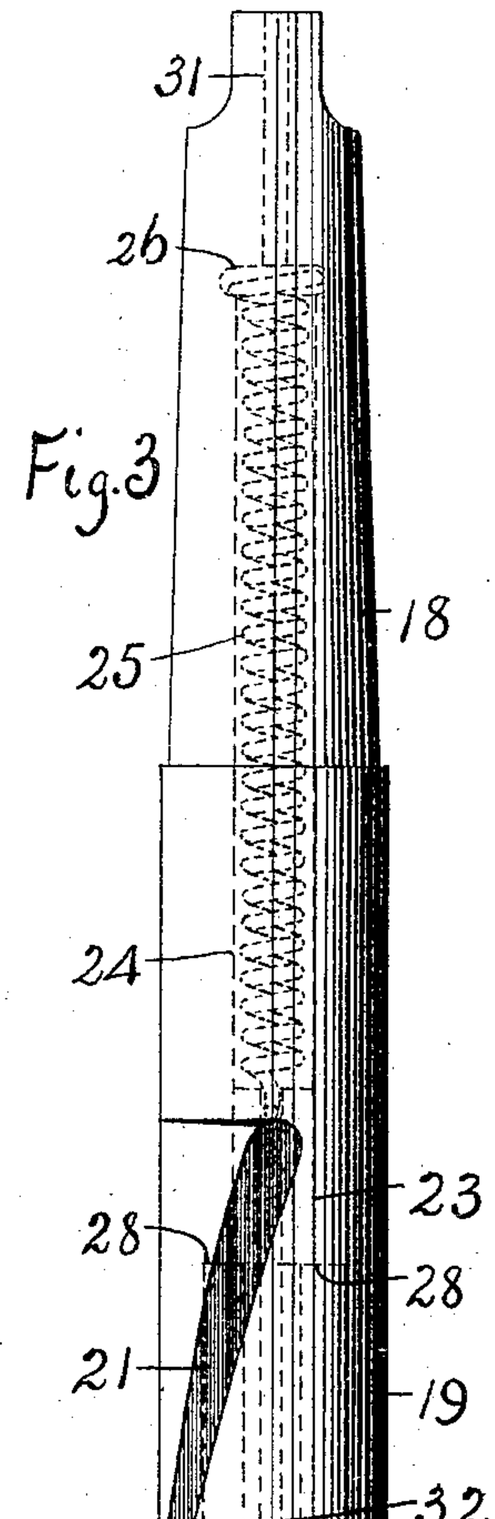
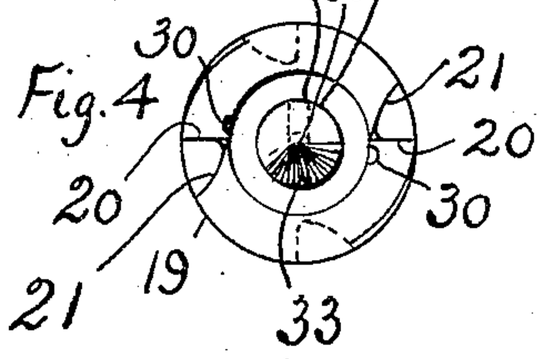


Fig. 4



Inventor.
Benjamin Brownstein
By R. C. Wright Atty.

No. 765,877. Patented July 26, 1904.

UNITED STATES PATENT OFFICE.

BENJAMIN BROWNSTEIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO HARRY L. ZOOKOVITZ, OF TRENTON, NEW JERSEY.

BORING AND REAMING TOOL.

SPECIFICATION forming part of Letters Patent No. 765,877, dated July 26, 1904.

Application filed March 1, 1904. Serial No. 196,026. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN BROWNSTEIN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Boring and Reaming Tools, of which the following is a specification.

This invention relates to boring-tools of annular construction adapted to cut only the exterior of the portion to be removed and at the same to also ream the hole smooth and true. The tools are formed with a hollow shell having an annular cutting edge which cuts away only an outer concentric ring portion of the material, the central or intermediate portion being thus removed without the expenditure of any power for its cutting away or the wearing away of the tools, resulting in a great saving of power, time, lubricating material, and prolonged life of the tools. The tools are especially adapted for forming large openings where heretofore boring-bars were necessary and can be used in many places where a boring-bar cannot be used, and means are provided to insure a constant flow of lubricant to the cutting edges and to insure accuracy in starting the tool by a specially-arranged center.

The invention is illustrated in the accompanying drawings, wherein similar reference characters indicate similar parts, in which—

Figure 1 is an elevation view of a large size drill and reamer, partly in section. Fig. 2 is an end view of Fig. 1. Fig. 3 is an elevation of a small drill and reamer. Fig. 4 is an end view of Fig. 3.

The larger tool, Figs. 1, 2, has a shank 1, preferably of standard taper, so it can be employed in the same machines as the tool now in use, and at the base of the shank the tool is enlarged in diameter and comprises an annular shell 2 with a series of cutting edges 3 at its lower end and therefrom grooves 4 upwardly tending. Within the shell 2 is a center 5, having its upper end guided in a receptacle 6 within shank 1 and secured to and bearing against a spiral spring 7, placed in hole 6, the upper end coil of the spring being enlarged to enter a chambered recess 8, by which means the center and spring are retained in place, but can readily be removed by pulling down on the spring and center. The spring keeps center 5 below the cutting edges 3 when the work is commenced and allows it to recede as the work progresses. The center 5 has also for its support from side movement a guide-plate 9 near its outer end, which fits snugly but freely within the annular shell 2 and recedes with the center. The guide-plate 9, shell 2, with its top 10, forms an oil-reservoir 11, filled through opening 12 by removing plug 13. Oil-hole 14 in the shank and 15 in the center, with branch openings 16, lubricate the center, and grooves 17 within shell 2 feed the oil to cutting edges 3. As cutters 3 progress the uncut center of the object being worked upon enters shell 2, pushing up center 5, spring 7, and plate 9, which not only forces oil through grooves 17, but forms a pressure in connection with spring 7 to remove the uncut center of material from the shell when the hole is completed by cutting away the ring of metal. The depth of shell 2 will be adapted to the thickness of the material operated upon.

In Figs. 3, 4 the smaller sizes of tools are illustrated. These have a shank 18, preferably of standard taper, with an annular shell 19 below, with cutting edges 20 and reamer-flutes 21. Within shell 19 is a center 22, having an enlarged head 23, guided within a chamber 24 in shank 18 and connected to a spring 25, which is enlarged at its upper end to enter a chambered recess 26 for the purpose heretofore described. Center 22 has a guide-plate 27 near its lower end, which fits snugly and freely within shell 19 and together with the shell sides and its top wall 28 forms an oil-chamber 29, having oil-grooves 30 to feed oil to the cutters 20. Shank 18 has an oil-hole 31 entering chamber 24, surrounding spring 25, by which oil enters the chamber. Center 22 has an oil-hole 32 communicating with chamber 24 and cross-openings 33, which permit oil to flow to the center's point 35, and cross-openings 36 above plate 27 in communication with chamber 29, these parts being

for the same purpose as already described for the larger tool.

I claim—

1. In a boring-tool, a shank, an annular cutting-shell projecting from the shank, a center having its inner end inserted in the shank its outer end projecting from the shell and adapted to recede into the shell as the cutting advances, resilient support for the shank, and a guide-plate at the outer end of the center and guided within the shell.

2. In a boring-tool, a shank and an annular cutting-shell, a center to guide the shell, a guide-plate at the lower end of the center, grooves on the shell, oil-grooves within the shell and adjacent the flutes, and means to introduce lubricating material within the shell at its top and to the center through the shank.

3. In a boring-tool, a shell having end cutters, a plate fitting within the shell, a center guided by the plate, an oil-reservoir formed by the shell and the plate aforesaid, an opening to introduce lubricating material to the reservoir and oil-grooves from the reservoir to the cutting edges aforesaid.

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

BENJAMIN BROWNSTEIN.

Witnesses:
R. C. WRIGHT,
LEWIS H. REDNER.