

(No Model.)

C. C. NEWTON.
MILLING MACHINE.

2 Sheets—Sheet 1.

No. 582,081.

Patented May 4, 1897.

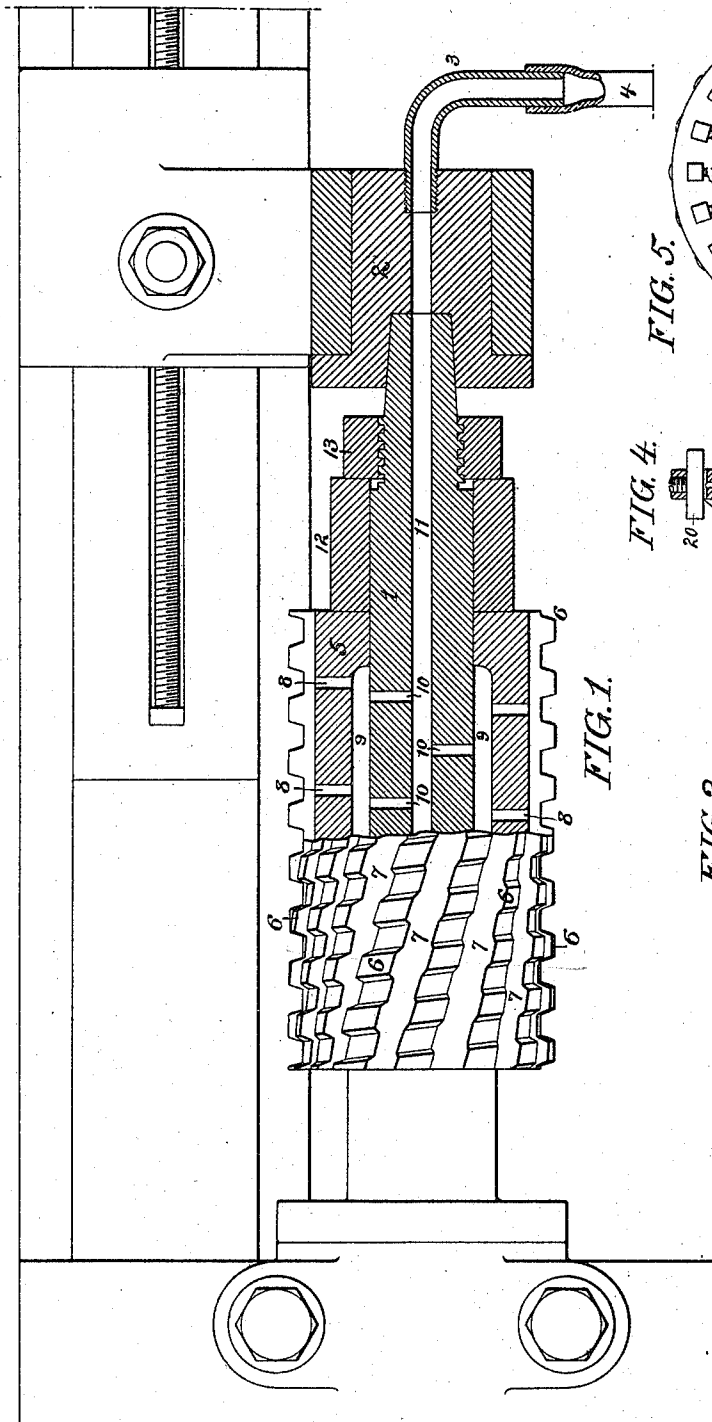


FIG. 1.

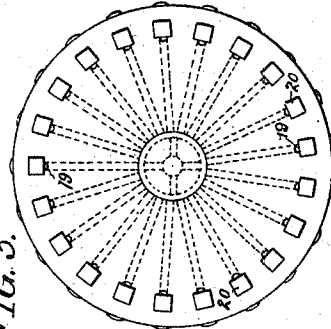


FIG. 5.

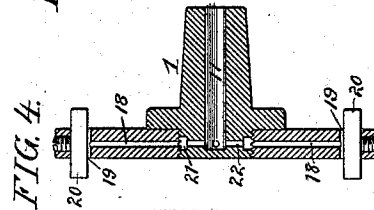


FIG. 4.

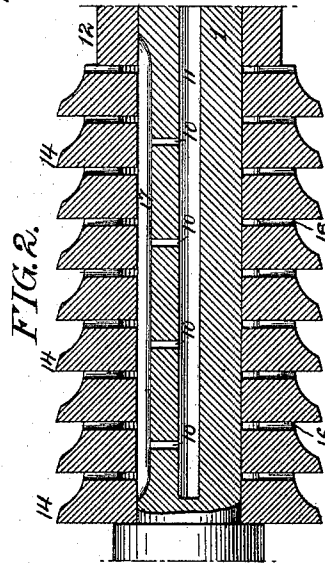


FIG. 2.

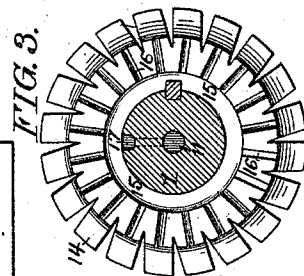


FIG. 3.

Witnesses:
Hamilton S. Turner
Murray C. Boyer

Inventor
Charles C. Newton,
by his Attorneys,
Howan & Howan

(No Model.)

2 Sheets—Sheet 2.

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FIG. 6.

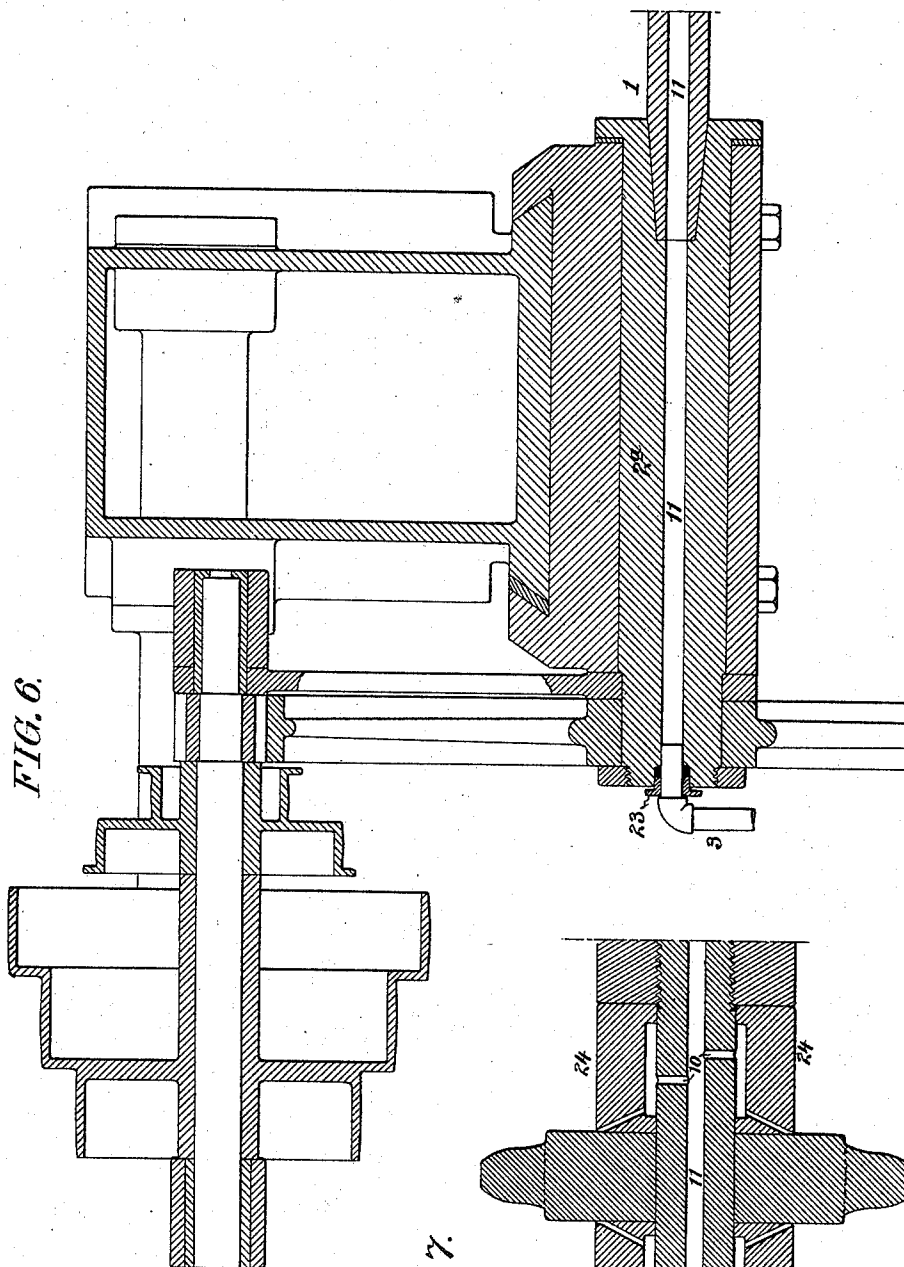
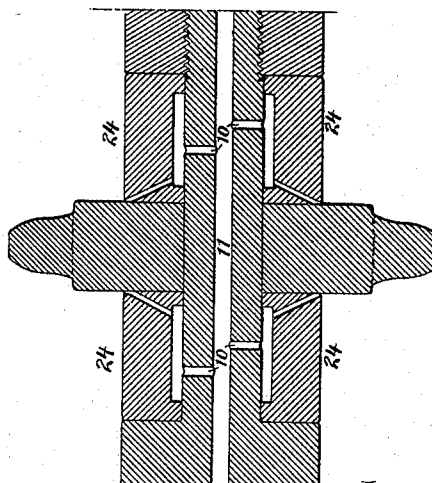


FIG. 7.



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UNITED STATES PATENT OFFICE.

CHARLES C. NEWTON, OF PHILADELPHIA, PENNSYLVANIA.

MILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 582,081, dated May 4, 1897.

Application filed December 10, 1896. Serial No. 615,173. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. NEWTON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Milling-Machines, of which the following is a specification.

The object of my invention is to provide for the effective lubrication of the cutters of a milling-tool, an object which I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a view, partly in longitudinal section and partly in elevation, of a milling-tool provided with lubricating devices constructed in accordance with my invention. Fig. 2 is a view showing the application of the invention to a built-up tool having a number of independent cutters. Fig. 3 is a face view of one of said cutters. Fig. 4 is a sectional view of a facing-cutter embodying the invention. Fig. 5 is a front view of said cutter, and Figs. 6 and 7 are longitudinal sectional views illustrating other embodiments of my invention.

The milling tool or cutter shown in Fig. 1 is mounted upon a hollow mandrel 1, which is adapted to turn at one end in a hollow bearing 2, from which projects a pipe 3, connected by a flexible tube 4, or in some other convenient manner, with a reservoir of oil or other lubricant either elevated or under pressure, so as to cause a constant flow of the lubricant into the hollow mandrel.

The milling-cutter 5, Fig. 1, is a cylindrical cutter having inclined external rows of cutting-teeth 6 alternating with grooves 7, which grooves are in communication, through passages 8, with a central chamber 9 of the cylinder, this chamber in turn being in communication, through radial openings 10 in the hollow mandrel, with the central aperture or passage 11 of said mandrel.

The cutter is confined in place between a shoulder at one end of the mandrel and a washer 12, upon which bears a nut 13, adapted to a threaded portion of the mandrel, although any other desired means for securing the cutter in place upon the mandrel may be adopted without departing from my invention.

When the cutter is in operation, lubricant finds its way from the central chamber 11 of

the mandrel through the passages 10 into the central chamber 9 of the cutter, and thence through the passages 8 to the grooves between the rows of teeth, so that the forward or cutting faces of these teeth are constantly lubricated, and the operation of the tool is thereby materially facilitated. Furthermore, the flow of lubricant through the body of the cutter tends to prevent heating of the same, and the presence of the openings in the body of the cutter insures a more nearly uniform hardening of the same when it is being manufactured than is possible when the body of the cutter is solid, as usual.

In the construction shown in Figs. 2 and 3 each of the individual cutters 14 of the series has an annular chamber 15, communicating through radial passages 16 with the toothed surface of the cutter, the mandrel in this case having one or more external longitudinal grooves or channels 17, so that the annular chambers of all of the cutters may be in communication with the central chamber of the mandrel.

In the facing-cutter (shown in Figs. 4 and 5) the cutter-head has radial channels 18, which communicate with transverse channels 19, adjacent to the inner face of each cutter 20, that portion of the mandrel which receives the cutter-head having an annular chamber 21, which communicates with the various passages 18 of the cutter-head and also communicates, through radial passages 22, with the central chamber of the mandrel.

In Fig. 6 I have shown a machine in which the supply-pipe 3 communicates directly with the central chamber of the hollow rotating mandrel or tool-holder 2^a through a stuffing-box 23 at the end of the same, and in Fig. 7 I have shown the application of my invention to a gear-tooth cutter, the channels for the flow of lubricant being formed in the flanking-washers 24, which confine the cutter, instead of being formed in the cutter itself. In some cases the channels formed in the various tools for the flow of lubricant may be used for the flow of air or water without departing from the essential features of my invention.

In all of the tools shown the cutting-surface is at the outer portion of the tool, so that passages extend outwardly from the central

chamber of the mandrel to such cutting-sur-
faces. Hence when the tool is rotated cen-
trifugal force serves as an efficient aid in
causing the free flow of lubricant to the cut-
5 ting-surface of the tool. In this respect my
invention differs from that class of lubricat-
ing devices which are applied to stationary
tools and to lubricating devices applied to
tools which cut at the end instead of at the
10 outer or peripheral portion.

Having thus described my invention, I
claim and desire to secure by Letters Pat-
ent—

1. The combination of the hollow mandrel
15 and the cutter structure mounted thereupon,
said parts having formed therein radial pas-
sages and an annular chamber interposed be-
tween said radial passages, whereby lubri-
cant from the hollow mandrel is distributed

to the surface of the cutter, with means for 20
supplying lubricant to said hollow mandrel,
substantially as specified.

2. The combination of the hollow mandrel
having radial passages communicating with
an external longitudinal channel, a cutter 25
structure mounted on the mandrel, and hav-
ing annular chambers communicating with
said longitudinal channel and also with the
outer toothed surface of the cutter, and means
for supplying lubricant to the hollow man- 30
drel, substantially as specified.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLES C. NEWTON.

Witnesses:

E. J. HANNUM,
JOS. H. KLEIN.