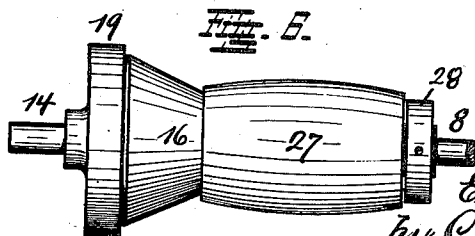
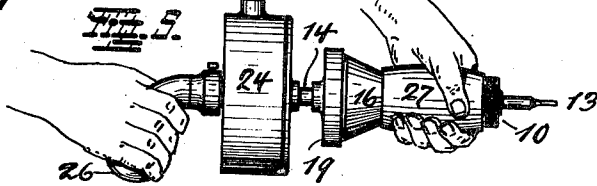
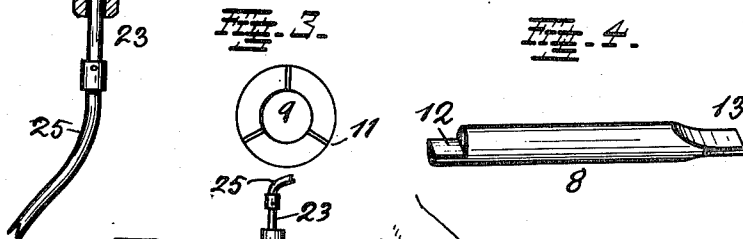
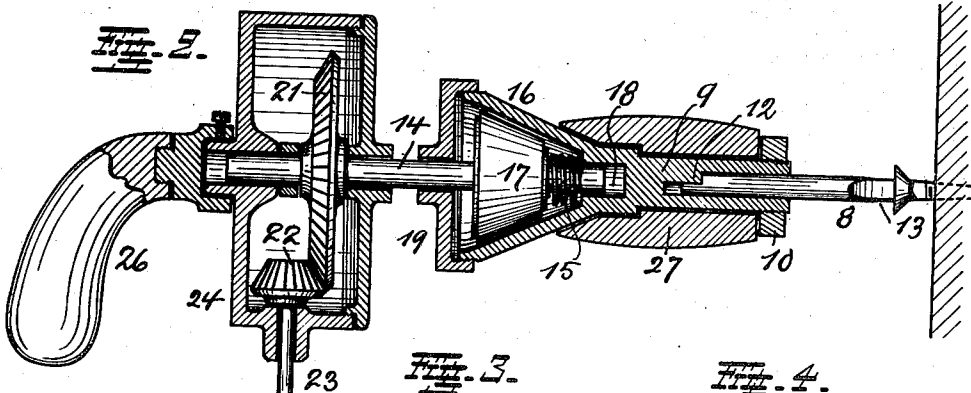
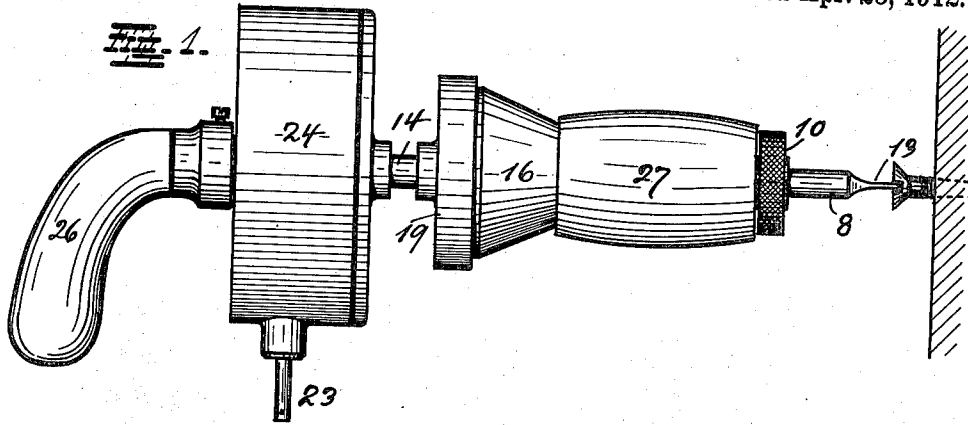


E. F. SMITH.
 PORTABLE POWER DRIVEN HAND TOOL.
 APPLICATION FILED SEPT. 7, 1911.

1,024,151.

Patented Apr. 23, 1912.



Witnesses.
 M. C. Blackburn.
 J. LeBeau.

Inventor:
 Edward F. Smith
 by C. Spengel atty.

UNITED STATES PATENT OFFICE.

EDWARD F. SMITH, OF CINCINNATI, OHIO, ASSIGNOR TO THE SMITH ELECTRIC TOOL CO., OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

PORTABLE POWER-DRIVEN HAND-TOOL.

1,024,151.

Specification of Letters Patent.

Patented Apr. 23, 1912.

Application filed September 7, 1911. Serial No. 648,054.

To all whom it may concern:

Be it known that I, EDWARD F. SMITH, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Portable Power-Driven Hand-Tool; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the drawing which accompanies this application and forms a part thereof.

This invention relates to improvements in portable, hand-manipulated tools driven by power and in which the action of the tool involves rotation.

The tool proper which directly effects the particularly work to be done may be a drill, reamer, boring-bit or other tool operating by rotation. It may also be a screw-driver bit in connection with which the invention is shown and described.

The invention consists of the particular construction hereinafter described and pointed out in the claims and illustrated in the accompanying drawing, in which:—

Figure 1, shows the tool in side elevation, Fig. 2, is a longitudinal section of the same. Fig. 3, is an enlarged end-view of the tool socket. Fig. 4, shows in perspective view a tool-bit, it being a screw-driver-bit in this case. Fig. 5, illustrates in a perspective view of reduced size manipulation of the tool. Fig. 6, shows in side-elevation a modified form of the tool.

8 indicates the shank of the tool-bit which is fitted to the bore of the bit-socket 9. It is held therein so as to rotate therewith by any suitable means which might be a set-screw. A clamping-nut 10, applied to the outer end of the socket may also be used. The bore of this nut or the threaded end which it engages is slightly tapered so that when the nut is screwed home the end of the socket is compressed, the same being slotted for the purpose as shown at 11 in Fig. 3. To prevent slipping of the bit, its inner end may be shaped as shown at 12 in Fig. 4, the inner end of the socket-bore being shaped complementary thereto. The outer end of the bit is shaped according to the work to be done and in this case forms a screw-driver as shown at 13.

14 is the shaft which receives the power. It transmits the same to the tool-socket by means of the opposite surfaces of two

friction-elements kept normally apart by a spring 15 which, when pressure is applied, yields and permits contact of the friction-elements. These elements consist of a cup-shaped, or internal friction cone 16 on the bit-socket and a complementary friction cone 17 on shaft 14. Shaft 14 extends beyond the narrow end of the cone and is fitted into a bore 18 in the inner end of the bit-socket for guidance of the friction elements. A cap 19 holds the tool-parts to each other by closing the open end of cup 16 and by confining cone 17, this being done without interfering with the movement for adjusting the friction elements. Cap 19 also forms an additional supporting guide for shaft 14 by being formed to contain a bearing for the same. It will now be seen, when pressure is applied in a manner causing the friction surfaces to contact with each other, that the power of shaft 14 is transmitted to the bit-socket and causes the same and the tool-bit carried by it to rotate.

The rotation of the tool-bit is at all times under perfect control as to rate of speed and may be varied by varying the pressure whereby the friction-elements are held in contact. One of the opposite friction surfaces is preferably covered with leather to promote ready contact. The power is instantly taken off from the bit-socket and bit as soon as the pressure is relieved. Connection of the power to shaft 14 is made at its end which projects beyond cap 19. In the form shown in Fig. 6, this end may be connected to a portable motor.

As shown in Figs. 1, 2 and 5, a beveled gear-wheel 21 is mounted on it and driven by a complementary gear-element 22. This latter is mounted on a shaft 23, supported in a gear case 24. The case is carried on shaft 14. Power is received from a flexible shaft 25 connected to shaft 23.

The manipulation of the tool is shown in Fig. 5. One hand grasps handle 26 secured to the casing and the other takes hold of a hand-hold 27, loosely carried on the bit-socket, it being held in place by nut 10 or by a collar 28. Pressure is applied by action on handle 26 and varied according to conditions. A screw for instance may be slowly started by application of light pressure and rapidly driven home by increasing the pressure. Rotation is stopped by removing the pressure, and this is done in-

stantly since there is nothing which holds the friction-elements positively in engagement. Nothing is done to the power-connected elements which operate without interruption. The implement as shown in Fig. 6, may also be used in connection with a stationary tool as for instance it may be attached to the chuck of a lathe or drill-press. In that case the pressure necessary to effect rotation of the bit is applied at hand-hold 27.

Having described my invention, I claim as new:

1. In a portable, power-driven hand-tool, the combination of a cylindrical bit-socket adapted to receive a tool-bit at one end and provided with an internal friction cone at its other end which has a shaft-bearing in its deepest part, a hand-hold loosely mounted upon the bit-socket, a cap fitted to close the internal cone and provided with a shaft bearing in its center, a driving shaft slidably fitted to the two shaft-bearings mentioned, a friction cone mounted on this shaft in a position to be within the internal friction cone, means to rotate this shaft, a spring supported on the shaft and positioned between the two cones to keep them yieldingly apart and a handle at the outer end of the shaft to hold the tool and to adjust the shaft lengthwise in its bearings and with reference to the internal friction cone.

2. In a portable hand-tool, the combination of a gear-case, a shaft mounted in the same, a gear-wheel on this shaft and with-

in the case, a pinion supported in this latter to actuate the gear-wheel, means to rotate the pinion, a cap slidably carried on the shaft, an internal friction cone connected to this cap and provided with a bit-socket, a friction cone mounted on this shaft so as to be within the internal friction cone, a spring between the two cones to keep them yieldingly apart and a handle on the gear-case serving to hold the tool and to effect and adjust contact between the cones against the action of the spring between them.

3. In a portable, power-driven hand tool, the combination of a bit-socket adapted to receive a tool-bit at one end and provided with an internal friction-cone at its other end, a cap fitted to close this cone and a handhold loosely mounted upon the bit-socket, a driving-shaft upon which this internal friction cone and its cap are slidably fitted, supporting-means for this shaft and means to rotate it, a friction-cone mounted on this shaft in a position to be within the internal friction-cone, and a spring between the two cones to keep them apart, but adapted to yield when either of the cones is moved with reference to the other one, to permit them to contact with each other.

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

EDWARD F. SMITH.

Witnesses:

C. SPENGLER,
T. LE BEAU.