

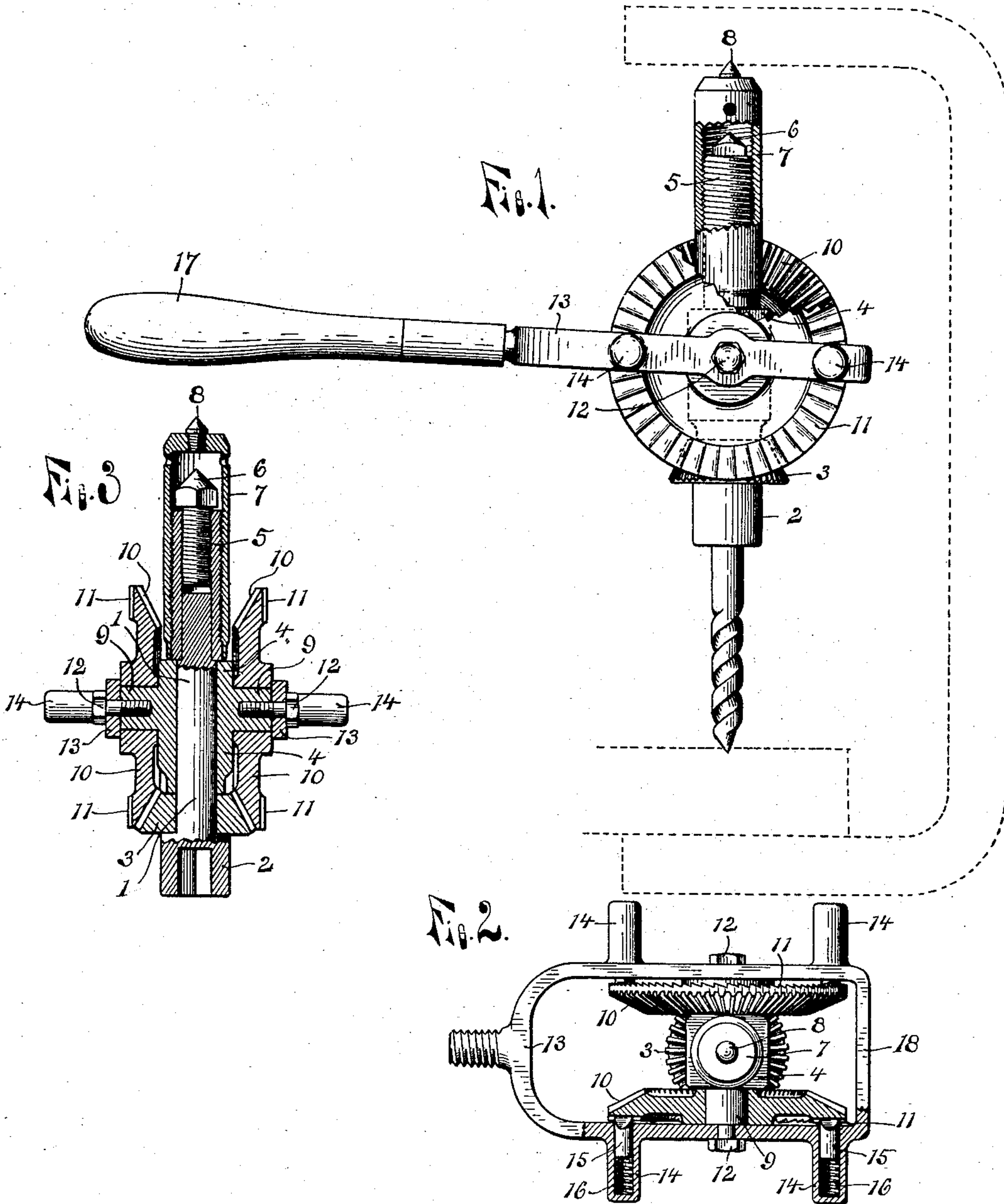
No. 765,308.

PATENTED JULY 19, 1904.

L. M. COOPER.
RATCHET DRILL.

APPLICATION FILED OCT. 15, 1903.

NO MODEL.



WITNESSES.

Lewis E. Flanders
Thomas A. Longstaff

INVENTOR.

Lyman M. Cooper
Barth S. Cooper
Attorneys.

UNITED STATES PATENT OFFICE.

LYMAN M. COOPER, OF OWOSSO, MICHIGAN, ASSIGNOR TO ARTHUR E. STEVER, OF OWOSSO, MICHIGAN.

RATCHET-DRILL.

SPECIFICATION forming part of Letters Patent No. 765,308, dated July 19, 1904.

Application filed October 15, 1903. Serial No. 177,101. (No model.)

To all whom it may concern:

Be it known that I, LYMAN M. COOPER, a citizen of the United States of America, residing at Owosso, in the county of Shiawassee and State of Michigan, have invented certain new and useful Improvements in Ratchet-Drills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in ratchet-drills; and its object is to provide a very strong and compact hand-drill which may be worked in a small space and either by moving the operating-lever longitudinally of the device or laterally, according to which-ever movement is most convenient, and also to so arrange and construct the ratchets, operating-lever, and pawls as to effectually prevent the pawls from slipping by reason of the springing of the parts and also so as to equalize the strain and turn the boring-tool continuously in one direction; and a further object is to provide certain other new and useful features, all as hereinafter more fully described, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a device embodying the invention with parts broken away to show the construction; Fig. 2, a plan view of the same with parts in section, and Fig. 3 is a transverse vertical section.

As shown in the drawings, 1 is the stock or mandrel, which is provided with a chambered head 2 at one end to receive the squared end of the tool or drill, and secured on the stock against the shoulder formed by the head is a bevel-pinion 3, by means of which pinion the stock is turned. A squared sleeve 4 is loosely mounted on the stock with one end bearing upon the pinion and held thereon by an externally-screw-threaded tubular member 5, which is secured to a reduced upper end of the stock in any suitable manner to unite it therewith and form a part thereof. The upper open end of this member 5 is internally-screw-threaded to receive the screw-threaded shank of a bearing-point 6, and an internally-screw-threaded sleeve 7, having a closed upper end provided with a bearing-point 8, is screwed

upon the member 5 and forms an extension for the shank, which may be turned by the operator to feed the tool to the work. When the space in which the drill must work is very limited, the sleeve 7 may be removed and the bearing-point 6 used instead, said point being turned out by a wrench to feed the tool to its work. The squared sleeve 4 is formed with laterally-projecting trunnions 9 extending from opposite sides thereof, and upon these trunnions are journaled to freely turn the bevel-gears 10 to engage and drive the pinion 3. Upon the outer side of each of these gears 10 and near its periphery are formed ratchet-teeth 11, and journaled upon the trunnions 9 by machine-screws 12, screwed into openings in the ends of said trunnions, is a forked lever 13, each arm or branch of which is provided with two sockets 14 for the pawls 15, which are forced outward from their sockets into engagement with the ratchet-teeth 11 by coiled springs 16 in the bottoms of said sockets. One end of the forked lever 13 is provided with a handle 17 and at the opposite end of the lever, the ends of the arms thereof are connected by a connecting-bar 18, said arms and bar thus forming a loop embracing the driving-gears 10.

The pawls and ratchet-teeth are so formed and those at each side are so arranged that upon the downward movement of the operating-lever those at one side operate to turn the gear at that side to drive the tool and upon the upstroke the gear at the opposite side is turned and turns the tool in the same direction. As the lever is pivotally secured to a sleeve on the stock, which sleeve is free to turn thereon, the lever-handle may be moved laterally and the tool be driven during the movement in one direction, as the pawls engaging one of the ratchets will hold that gear from turning, which gear will in turn lock the pinion, and thus the tool will turn with the movement of the handle.

By providing two pawls for each ratchet to engage the same at opposite sides thereof the strain is equalized and the ratchet turned much more easily than by the use of but one pawl, as the pawl at one side of each ratchet

is pushing downward thereon to turn the ratchet while the pawl at its opposite side is exerting an upward force to turn the ratchet in the same direction, and by making the operating-lever in the form of a loop or connecting the ends of its arms the lever is prevented from springing away from the ratchets when force is exerted to turn the same and allowing the pawls to slip by their teeth. The slipping of the pawls is also prevented by arranging them to work inward on the ratchets, as they thus force the ratchets up against their supporting-sleeve and are therefore more firmly held and less liable to spring. The hub portion of each gear 10 is extended slightly to engage the inner face of the arms of the lever, and thus hold the lever against any lateral movement upon its bearing-screws 12, which therefore need not be turned up with their heads hard against the lever, but loosely, allowing the lever to turn freely.

Having thus fully described my invention, what I claim is—

1. In a ratchet-drill, the combination with a stock provided with a socket to receive the drilling-tool and a bearing-point at its upper end, and a pinion secured on said stock; of a squared sleeve loosely mounted on said stock and having trunnions extending outward at opposite sides thereof, gears on said trunnions to engage the pinion and provided with ratchet-teeth on their outer sides near their

peripheries and having their hubs extended slightly beyond the plane of said teeth, a lever formed with a loop adapted to embrace the parts and pivotally secured to the trunnions in engagement with the outer face of said hubs and provided with sockets, pawls in said sockets, and springs engaging said pawls to force the same inward into contact with the ratchet-teeth on said gears.

2. In a ratchet-drill the combination of a stock provided with a socket to receive the drilling-tool, a pinion secured on said stock, a squared sleeve on said stock having laterally-extending trunnions, gears on said trunnions having ratchet-teeth formed on their outer sides near their peripheries, a forked lever the arms of which extend adjacent to the outer sides of said gears and are pivotally secured to the outer ends of said trunnions, two sockets on each of said arms at diametrically opposite points of each of the gears, pawls in said sockets to engage the ratchet-teeth, springs within the sockets to force the pawls into engagement with the ratchet-teeth, and a bar connecting the ends of the arms of the lever to form a loop embracing the gears.

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

LYMAN M. COOPER.

Witnesses:

G. L. TAYLOR,
I. H. KEELER.