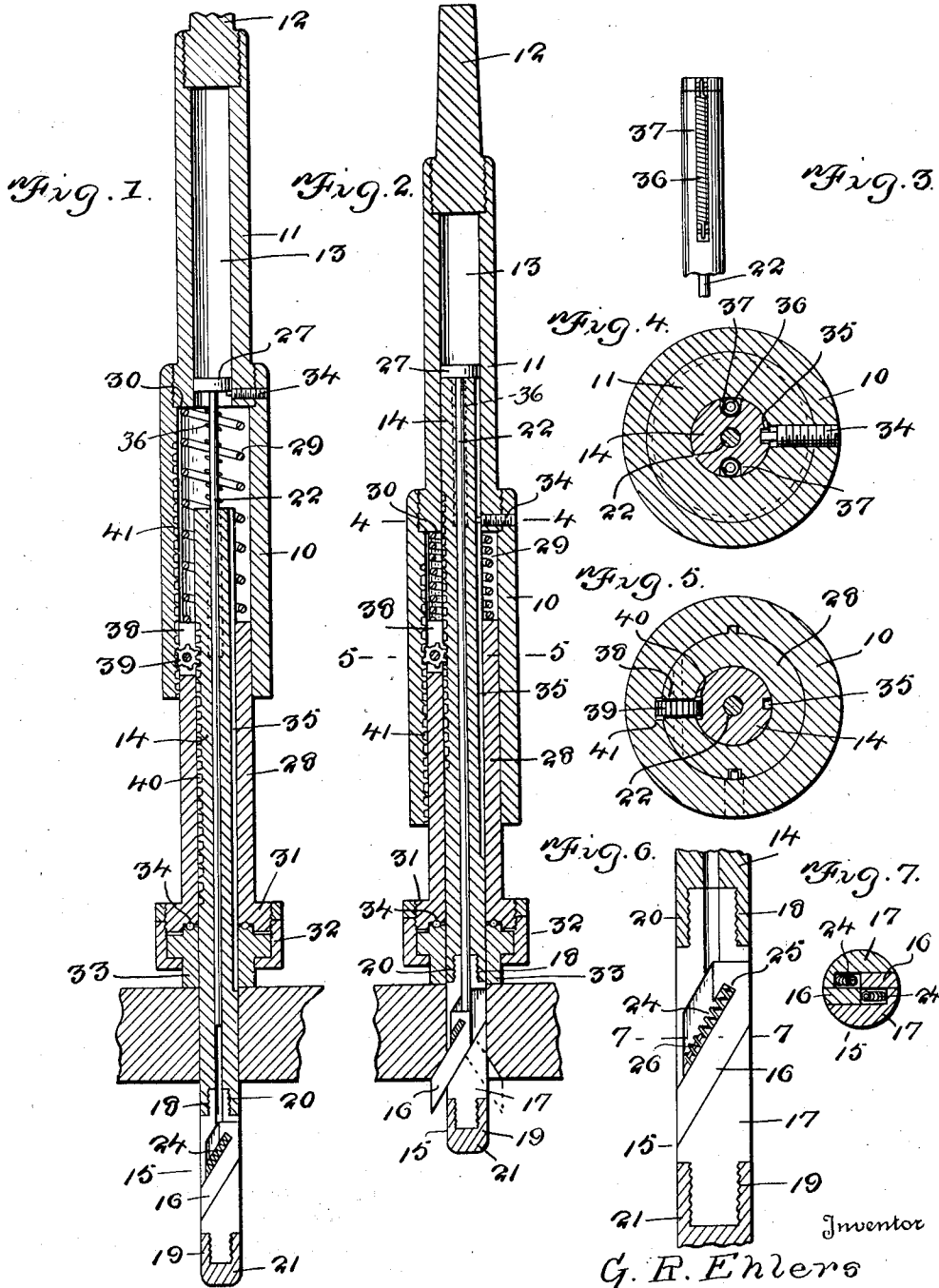


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COUNTERSINKING TOOL.
APPLICATION FILED OCT. 28, 1919.

1,362,529.

Patented Dec. 14, 1920.



Witnesses
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COUNTERSINKING-TOOL.

1,362,529.

Specification of Letters Patent.

Patented Dec. 14, 1920.

Application filed October 28, 1919. Serial No. 334,028.

To all whom it may concern:

Be it known that I, GEORGE R. EHLERS, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, have invented new and useful Improvements in Countersinking-Tools, of which the following is a specification.

This invention relates to improvements in tools for counter-sinking and aims to provide a tool whereby the operation of counter-sinking may be performed from the opposite or reverse side of the counter-sink.

This is specially desirable when the counter-sink is to be located upon the bottom face of the plate, or other piece of work, to avoid the employment of two men for holding the operating tool, the present tool acting under pressure exerted from above to draw the counter-sinking bit upward in a direction opposite to the direction of pressure and capable of being operated after the manner of an ordinary drill.

Another object of the invention is the provision of a counter-sinking tool in which the cutting blades are normally housed within the shank of the tool to permit of their being inserted through an opening, the operation of resting the tool upon the work and exerting an initial pressure thereon preparatory to countersinking, causing the blades to be forced outward for use.

Another object is the provision of a counter-sinking tool of the above character, which is simple and durable in construction and which may be operated with a minimum amount of time and labor.

Other objects and advantages of the invention will appear as the following description is read in connection with the accompanying drawings,

In the drawings:—

Figure 1 is a longitudinal sectional view through a tool showing the parts in normal positions.

Fig. 2 is a view similar to Fig. 1, with the parts in position for use and the bit expanded.

Fig. 3 is a fragmentary elevation of the upper end of the inner sleeve.

Fig. 4 is a transverse sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a similar view on the line 5—5 of Fig. 2.

Fig. 6 is an enlarged fragmentary longitudinal section through the lower end of the inner sleeve and showing the cutting blade or bit.

Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 6.

Referring to the drawings in detail, wherein like characters of reference denote corresponding parts, the tool comprises a body member, which is preferably circular in cross section, being hollow and forming an outer sleeve 10. This sleeve carries a reduced extension 11, which projects from one end and terminates in a shank 12 by means of which the tool is secured in a suitable operating member.

The reduced extension 11 of the body member is provided with a central bore 13, and operating longitudinally of this bore and extending through the outer sleeve 10, is an inner sleeve 14. One end of the sleeve 14 projects beyond the end of the tool and carries an expansible bit 15. This bit includes a pair of oppositely slidable cutting blades 16, which operate in a slot extending transversely through the lower end of the inner sleeve 14. This end of the sleeve is formed of separate sections 17 of substantially semicircular cross sectional shape, having their opposite ends reduced and threaded as indicated at 18 and 19, the former entering a threaded socket 20 and the latter receiving a cap 21, which holds the sections together. Extending upward through the inner sleeve 14 is a longitudinally slidable bit expanding rod 22, the lower end of which is adapted to engage the inner ends of the cutting blades 23 and to force them outward beyond the periphery of the end of the sleeve 14, the said blades being urged inwardly within the periphery of the sleeve by means of springs 24, one end of which enters a notch 25 formed in each of the blades 23 and the opposite end bears against a shoulder 26 formed in each of the sections 17. The opposite end of the rod 22 is provided with a head, which operates within the bore 13.

Surrounding the inner sleeve 14 and slidably mounted within the sleeve 10, is an intermediate sleeve 28. A spring 29 located within the outer sleeve has one end bearing against a shoulder 30 provided therein and the opposite end against the upper end of

the intermediate sleeve 28 and acts to normally force the sleeves 10 and 28 outward with respect to one another. The lower or outer end of the sleeve 28 is provided with a flange 31 and threadedly secured upon this flange is a collar 32, which serves to connect to the lower end of the sleeve 28 a bearing member 33. Antifriction devices 34 are located between the lower end of the sleeve 28 and the bearing member 33, so that the latter may rest upon the work and provide for the free rotation of the tool.

As illustrated in Fig. 1 of the drawings, the end of the rod 22 is normally disengaged from the cutting blades 23, being held in such disengaged position through the medium of a screw 34, which enters the threaded opening provided in the outer sleeve 10 and has a reduced extremity engageable beneath the head 27, the said extremity also being engageable with a longitudinally disposed slot 35 provided in the inner sleeve 14. The inner sleeve 14 is also connected to the head 27 through the medium of coil springs 36, which are located upon diametrically opposite sides of the said sleeve and within slots 37 provided in the said sleeve.

The intermediate sleeve 28 is slotted at one end as indicated at 38 and rotatably mounted in this slot is a pinion 39, which is adapted to engage a rack 40 provided longitudinally of the inner sleeve 14 and a rack 41 provided upon the inner periphery of the outer sleeve 10.

The parts of the tool being in the position indicated in Fig. 1, the bit end of the tool is inserted through the opening to be countersunk. When pressure is applied to the tool, the end of the rod 22 will engage the ends of the cutting blades 23 and force the cutting edges outward to the position shown in Fig. 2, whereupon further downward pressure exerted during the operation of the tool will cause the outer sleeve 10 to move downward and this downward movement will, through the engagement of the pinion 39 with the racks 40 and 41, cause the inner sleeve 14 to move upward, the movement being regulated by the cutting of the bits or blades 23. After the counter-sinking operation has been completed, and pressure is relieved from the tool, the cutting blades will be automatically re-

tracted, whereupon the tool may be withdrawn from the openings.

The invention is susceptible of various changes in its form, proportions and minor details of construction, and the right is herein reserved to make such changes as properly fall within the scope of the appended claims.

What is claimed is:—

1. A counter-sinking tool embodying a plurality of telescopic members, rack teeth carried by said members, an expansible bit projecting beyond one end thereof and a pinion connecting the telescopic members, whereby pressure exerted upon the tool in the direction of the bit will expand the same and move the bit in a direction opposite to the direction of pressure.

2. A counter-sinking tool comprising a body portion, having an attaching shank at one end thereof, a sleeve movable longitudinally of the body portion and having an expansible bit located at the end opposite the shank and projecting beyond the body portion, a rod extending through the sleeve and having one end engageable with the bit, spring actuated means for holding the bit against such expansion, and means whereby pressure upon the body portion of the tool in a direction toward the bit will operate the rod and expand the bit and act to move the said bit in a direction opposite to the direction of pressure upon the body portion.

3. A counter-sinking tool comprising a body portion having an attaching shank at one end thereof, a sleeve movable longitudinally of the body portion and having an expansible bit located at the end opposite the shank and projecting beyond the body portion, a rod extending through the sleeve and having one end engageable with the bit for holding the bit against such expansion, means whereby pressure upon the body portion of the tool will release the holding means and permit of the expansion of the bit and a pinion connecting the body portion and sleeve, whereby said pressure upon the body portion will also act to move the bit inwardly in a direction opposite to the direction of pressure.

In testimony whereof I affix my signature.

GEORGE R. EHLERS.