To all whom it may concern:

Be it known that I, CHARLES SWANSON, a citizen of Sweden, residing at Portland, in the county of Multnomah and State of Oregon, have invented new and useful Improvements in Reversible Countersink-Tools, of which the following is a specification.

The present invention comprehends generally improvements in metal cutting tools and more particularly relates to a reversible countersink tool.

It is the principal aim and object of this invention to provide a device of the above mentioned character designed to be used on portable pneumatic drills, of that type especially adapted for ship drilling, the cutter proper being removable and reversible so that instead of necessitating the turning of the plates the countersink may be provided from underneath by merely arranging the shank of the controlling machine through the hole about which the countersink is provided.

More particularly the present invention contemplates the provision of a reversible cutter for removable engagement with a standard shank while acting in conjunction with the cutter proper is improved retaining means for releasably holding the cutter in a desired position on the shank.

It is a more specific object of this invention to provide resilient means for normally holding the locking dogs extended and to also provide improved means for retracting the dogs to permit of the moving and reversing of the cutter proper.

Among the other aims and objects of this invention may be recited the provision of a device of the character described with a view to compactness, and in which the number of parts are few, the construction simple, the cost of production low and the efficiency high.

Other improvements and novel details in the construction and arrangement of the various parts of the apparatus will be brought out more in detail in the description to follow, which for a clear understanding of the invention should be considered in connection with the accompanying drawings forming a part hereof, and wherein is disclosed for the purpose of illustration a convenient and satisfactory embodiment of the invention. It is to be noted in this connection that minor changes in the construction and arrangement of parts may be made without departing from the principle of operation of the various parts.

The invention is clearly illustrated in the accompanying drawings, in which:

Figure 1 is a vertical sectional view through the cutter and the shank with the locking means shown in elevation.

Fig. 2 is a vertical section taken on line 2—2 of Fig. 1.

Fig. 3 is a cross section taken on line 3—3 of Fig. 1.

Fig. 4 is a transverse section taken on line 4—4 of Fig. 1.

Fig. 5 is a transverse section taken on line 5—5 of Fig. 1.

Fig. 6 is a top plan view of the cutter.

Fig. 7 is a vertical sectional detail of the shank.

Fig. 8 is an end elevation of the shank, and Fig. 9 is a perspective detail of one of the dogs.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now, more particularly, to the accompanying drawings there is provided a rotatable shank 1 the outer portion of which is slightly reduced to provide an annular shoulder 2. The reduced portion of the shank is provided with a transversely rectangular opening 3 while the opposite side walls are provided with opposed grooves or recesses 4 and the shank is further provided with a longitudinal bore 5 communicating with the outer end of the shank and with the adjacent end of the opening. And the outer portion of this bore is enlarged and threaded as at 6 for a purpose that will hereinafter become apparent.

A cutter generally indicated by the numeral 7 consists of an annular ring-like body 8 one edge of which is beveled and provided with cutting teeth 9. The opening 10 formed centrally through the body permits the attachment of the cutter on the shank to abut the shoulder 2. The body of the cutter is also provided on its upper and lower edges at opposite points of the opening 10 with opposed recesses 11 and 12 for a purpose that will presently appear.

With a view toward providing improved
means for releasably retaining the cutter in a stationary position on the shank there is employed a pair of complemental dogs each of which is indicated in its entirety by the numeral 13. Each dog consists of a rectangular relatively flat body 14 reduced at one side edge and near one end to provide a shoulder 15. The outer enlarged portion of each body constitutes an engaging end or pawl 16 and is formed near the free terminal with an opening in which is arranged a vertical stop member 17. A lug 18 depends from the inner end of the body.

In assembling the dogs it is to be observed that the enlarged end portions are of a width substantially equal to the width between the opposed recesses 4 while the stop members are of a height equal to the height of the openings 3 and the openings in the recesses as a result serve to guide and retain the dogs the reduced portions of the bodies of which are arranged side by side while the inner end portions of each dog are positioned in proximity to the shoulder 15. The lower edge of the lugs 18 contacts with the bottom of the opening 3. A coil expansion spring 19 is arranged in the upper part of the opening 3 and has its respective ends bearing against the upper portions of the stop and is designed to normally hold the dogs extended so that they will engage either the opposed recesses 11 or the opposed recesses 12 depending on whether or not it is desired to provide a countersink at the top or bottom surface of the plate and about an opening therein. When extended and engaged in this manner the lugs serve to retain the cutter rigidly on the shank and against the shoulder as indicated.

As intimated, improved means have been provided for removing the cutter and in reducing this feature of the invention to practice there is employed a cylindrical plug 20 which is inserted within the bore and has its upper end tapered in a conical form as at 21 to form a reduced head 22 which is arranged between the lugs formed on the inner ends of the dogs. The lugs are normally positioned so that they will ride upon the tapered or inclined portion 21 of the plug when the latter is inserted upwardly and will thereby be drawn inwardly from the recesses in the cutter and against the tension of the spring 19 to permit of the removal of the cutter. Normally these lugs contact with the head 22 and are prevented from accidental displacement thereby. An externally threaded tubular stub 23 is arranged in the threaded portion 8 of the bore and serves to properly support the plug being provided at its outer edge with the kerf 94 in which a suitable tool such as a screw driver may be engaged when it is desired to remove the same. Of course, it is apparent that by the tubular configuration of the stub that a suitable instrument such as a tool may be passed therethrough so as to exert a pressure on the plug when it is desired to raise the same with a view of retracting the dogs.

In use to provide a countersink about an opening at the upper face of the plate it is only necessary to place the cutter in engagement with the edges of the opening while the rotatable shank will operate the cutter. When the countersink has been provided in stead of turning the plate over the plug may be shoved upwardly to retract the dogs and thus release the cutter. The shank 1 is now arranged through the opening in the work (not shown) and the cutter applied in the position indicated in Fig. 1 so that the cutter teeth will act against the lower edge of the opening in the work (not shown) on the operation of the shank.

It is believed in view of the foregoing description that a further detailed description of the invention is entirely unnecessary. Likewise it is believed that the advantages of the invention will be readily apparent.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limited sense. It is also to be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

What is claimed is:

1. In combination, a rotatable shank reduced to form a shoulder and having an opening through the reduced portion, a cutter adapted to be reversibly fitted on the reduced portion of the shank and against the shoulder, opposed dogs slidably mounted in the opening in the shank and designed to removably engage and retain the cutter rigid with respect to the shank, a coiled spring positioned between the dogs for normally holding the dogs extended, and a manually adjustable plug in the reduced portion of the shank designed to engage and retract the dogs when it is desired to remove and refit the cutter.

2. In combination, a rotatable shank reduced to form a shoulder and having an opening through the reduced portion, a cutter adapted to be reversibly fitted on the reduced portion of the shank and against the shoulder, opposed dogs slidably mounted in the opening in the shank and designed to removably engage the cutter to retain the same rigid with respect to the shank, resilient means normally hold-
ing the dogs extended, a plug carried within
the reduced portion of the shank, and an ex-
teriorly threaded tabular stub engaged in
the reduced portion of the shank and bear-
ing against the plug for the manual adjust-
ment of the same, whereby a pointed imple-
ment may be passed through the stub and
engage with the plug to operate the same in-
dependent of the stub so that the dogs may
be drawn in against the action of the resilient means to permit the removal of the
cutter.
In testimony whereof I affix my signature.
CHARLES SWANSON.