

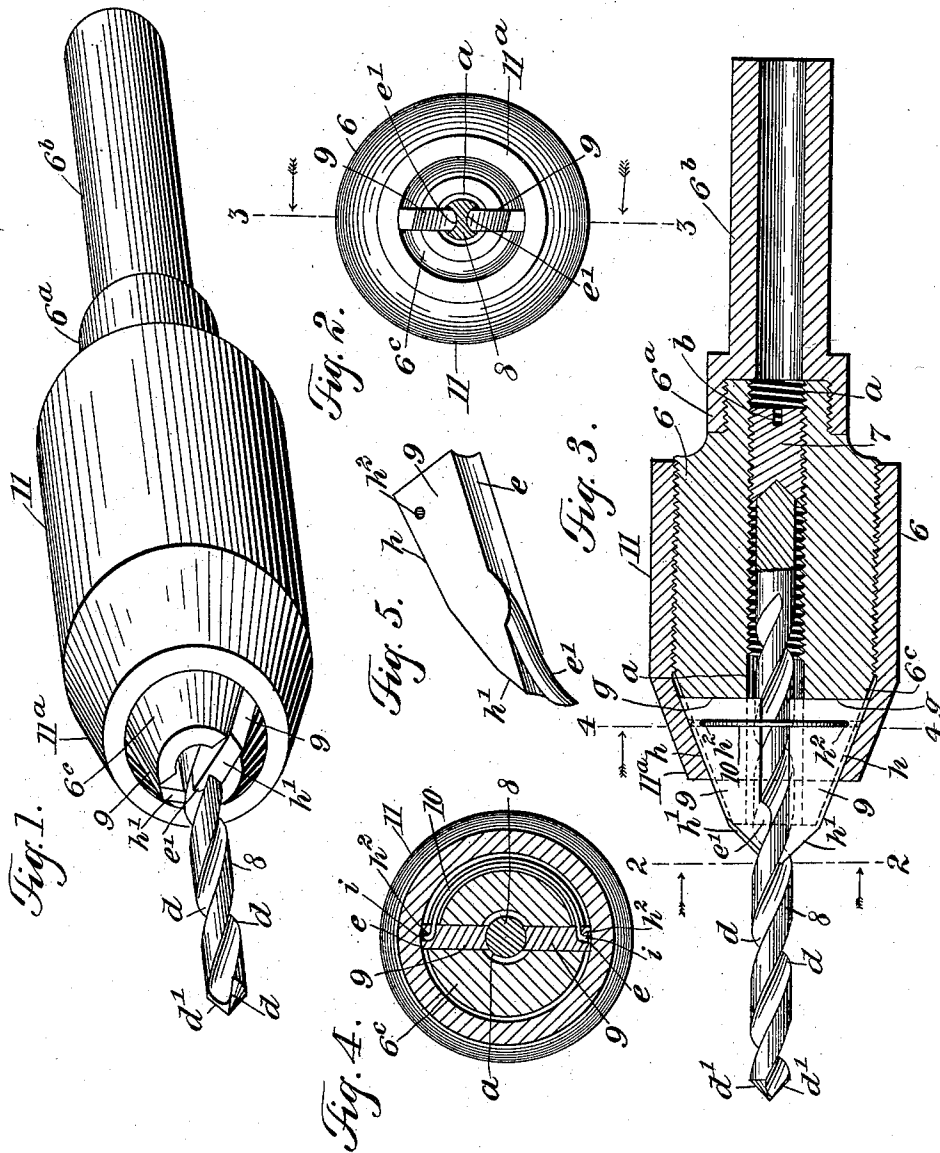
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J. E. FUHRER.
COMBINED DRILL AND REAMER.

APPLICATION FILED MAR. 3, 1903.

NO MODEL.



WITNESSES:

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JOHN EARL FUHRER, OF PITTSBURG, PENNSYLVANIA.

COMBINED DRILL AND REAMER.

SPECIFICATION forming part of Letters Patent No. 745,048, dated November 24, 1903.

Application filed March 3, 1903. Serial No. 145,912. (No model.)

To all whom it may concern:

Be it known that I, JOHN EARL FUHRER, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Combined Drill and Reamer, of which the following is a full, clear, and exact description.

The object of this invention is to provide a novel means for adjustably holding a drill and an improved countersinking reamer device in one chuck for successive use.

The invention consists in the novel construction and combination of parts, as is hereinafter described, and defined in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of the improvement. Fig. 2 is a partly-sectional end view of the device substantially on the line 2-2 in Fig. 3. Fig. 3 is a longitudinal sectional view substantially on the line 3-3 in Fig. 2. Fig. 4 is a transverse sectional view substantially on the line 4-4 in Fig. 3, and Fig. 5 is a perspective view of one of a pair of reamer-blades employed.

The chuck that serves to hold a drill and the improved countersinking-reamer in relative positions for service comprises the following details: A cylindrical chuck-block 6, axially perforated at *a* and threaded in said perforation, receives the exteriorly-threaded abutment-plug 7, which may be rotated for its longitudinal adjustment in the threaded bore of the chuck-block by the use of a suitable tool (not shown) that may have engagement with a transverse kerf *b*, formed in one end of the plug, as shown in Fig. 3. The chuck-block 6 at the end in which the plug 7 is inserted is considerably reduced in diameter and is threaded on said reduced end portion or nipple, thus being adapted for the screwed engagement therewith of the socket-nut 6^a, formed on one end of the driver-shank 6^b, that affords means for holding the entire device in a suitable machine for its rotary movement.

At the opposite end of the chuck-block 6 a

coniform head 6° is integrally formed, and said head is transversely slotted across its axis from the outer end longitudinally a suitable distance to afford a channel or slot each side of the center bore *a* of the chuck-block, which at this end thereof is not threaded. In the end of the abutment-plug 7 opposite that having the kerf *b* a coniform cavity is centrally formed, wherein the coniform end of a twist-drill 8 is seated, the body of the drill extending centrally between the longitudinal channels before mentioned, and, as usual, the twist-drill is essentially cylindrical, having two spaced spiral grooves *d* formed therein, which extend from near the inner end of the drill-body to the outer end thereof, terminating in the cutting-lips *d'*.

Two similar reamer-blades 9 form essential features of the invention, and each consists of a flat steel plate of proper thickness to fit loosely in a respective channel formed to receive it in the coniform head 6° of the chuck-block 6. As shown in Figs. 3 and 5, the reamer-blades each have one straight edge *e*, that is concaved to adapt said edge to fit upon the body of the drill 8, and from the grooved edge of each reamer-blade a rib *e'* projects longitudinally and diagonally across it, these ribs having the same spiral twist as that of the grooves *d*, so that the ribs will loosely fit in said grooves when the blades are properly located in the slots provided for their accommodation in the coniform head of the chuck-block 6.

The end of each reamer-blade 9 that may abut against a transverse wall *g*, which defines the length of the channel occupied by a respective blade, is of such width that when the reamer-blades are in contact with the walls *g* the outer side edges *h* of the reamer-blades that taper similarly to the taper of the coniform head 6° will project slightly outside of the tapering head, as is indicated by full and dotted lines in Fig. 3. The reamer-blades 9 have such length as will adapt them to project somewhat in advance of the end of the head 6°, and the side edges *h'* of these projecting portions, that are extensions of the sloped edges *h*, have a steeper inclination, which preferably disposes them, respectively, at an angle of forty-five degrees with regard to

the axis of the drill-body 8. Each side edge h' is beveled transversely to produce an effective cutting edge thereon, which edges cut in the same direction as do the lips d' on the drill 8.

- 5 The cutting-edges h' are so disposed that their lower ends bed in the grooves d , whereby these cutting edges will cleanly remove all the material around the edge of the hole drilled by the drill 8 and afford a smooth
10 countersunk formation for the accommodation of the head of a screw or the like. In each blade 9 near the wide end and sloped edge h a transverse perforation h^2 is formed, said perforation being angular, so that they
15 each cut through a respective edge h .

- In the tapered wall of the chuck-head 6° a circumferential groove is formed which is nearly semicircular, and in said groove is bedded a spring 10, having its ends bent into
20 hook form, as shown at i in Fig. 4, these hooks having engagement within the angular perforations formed in the reamer-blades 9, and it will be seen that the resilience of the curved spring 10 will retain the blades 9 in
25 place within the channels formed for their reception in the chuck-head 6°. The chuck-block 6 is externally threaded throughout its cylindrical surface, and upon this portion of said chuck-block the cylindrical part of
30 a keeper-sleeve 11 is mounted, said sleeve being internally threaded for a portion of its length that is cylindrical to permit it to be loosely screwed on the chuck-block. The unthreaded integral forward portion 11^a of
35 the keeper-sleeve 11 is rendered coniform and is so proportioned that the inner surface of the coniform portion will be adapted to press upon the sloped outer edges of the reamer-blades 9 when the sleeve is fully
40 screwed upon the threaded body of the chuck-block 6, and thus hold the reamer-blades in enforced contact with the body of the drill 8, supporting said drill in a central position within the chuck-block.

- 45 It will be seen that as the ribs e' are bedded in the spiral grooves d the drill-body will be held from rotating in the chuck-block if said drill is prevented from moving longitudinally therein, and to this end the plug 7 may be
50 adjusted to bear upon the inner end of the drill, so that the drill and the reamer-blades will be held to rotate with the chuck-block.

- As the release of the plug 7 will permit the drill 8 to be moved into the chuck-block and
55 be secured at a desired point therein by the plug 7, it will be evident that a hole or any number of holes of a predetermined depth may be formed in material and each hole countersunk before the removal of the drill
60 therefrom.

- As the sleeve 11 may be readily removed and convenient access be thus afforded to the reamer-blades 9 for their removal from the chuck-block, said blades may at any time be
65 sharpened and replaced for renewed service.

Having thus described my invention, I

claim as new and desire to secure by Letters Patent—

1. In a device of the character described, a chuck-block having an axial bore and a
70 slotted end, an abutment-plug adjustable in said bore, a twist-drill slidable in said bore and seated on the plug, reamer-blades held to rotate in the slotted end of the chuck-block, said blades having projections on the
75 edges thereof that seat in the grooves of the drill, and a keeper-sleeve mounted on the chuck-block and adapted to press on the outer edges of the reamer-blades, to center the drill and secure said blades in the head of the
80 chuck-block.

2. In a device of the character described, a cylindrical chuck-block having a threaded axial bore, an oppositely-slotted coniform head, and a thread on its cylindrical body, a
85 peripherally-threaded plug having a kerf in one end and a cavity in the other end, said plug screwing into the bore of the chuck-block, a twist-drill slidable in the bore of the chuck-block and projecting from its coniform
90 head, two similar reamer-blades fitted in the slots in the chuck-block head, said blades having sloped outer edges terminating at their front ends in beveled countersinking cutting edges, diagonal ribs on the inner edges
95 of the reamer-blades, engaging spiral grooves in the drill, and a keeper-sleeve screwing upon the chuck-block and having a coniform end adapted to bear upon the sloped edges of the reamer-blades to press them upon the
100 drill.

3. In a device of the character described, a peripherally-threaded chuck-block having a coniform head on one end, and a reduced threaded nipple on the opposite end to receive
105 the recessed and internally-threaded end of a driver-shank, the said coniform head being provided with opposite longitudinal slots and having a circumferential groove, an axial bore in the chuck-block having a threaded wall,
110 an abutment-plug screwing into the threaded bore, a twist-drill centered in the head and body of the chuck-block and seated on the plug, two reamer-blades provided with perforations and fitted in the opposite longitudinal
115 slots in the chuck-block head, said blades having sloped outer edges, concave inner edges and a diagonal rib in each concave edge for engagement with the grooves in the drill, a bent spring seated in the circumferential groove in the chuck-block head and having hooked ends that engage the perforations in the reamer-blades to hold them in the slots, and a keeper-sleeve having a coniform end, said sleeve being internally threaded
120 and screwing upon the chuck-block to press its coniform end upon the sloped edges of the reamer-blades.

4. In a device of the character described, a chuck-block having an axial bore and provided with a slotted coniform head, a plug
130 adjustable in the bore, a drill slidable in said

bore and engaged by said plug, reamer-blades held in the slotted coniform head and each having a grooved edge to fit upon the body of the drill, and a rib projecting from the
5 grooved edge, the ribs fitting on the grooves of the drill, and a keeper-sleeve screwing upon the chuck-block and having a coniform end for the purpose set forth.

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

JOHN EARL FUHRER.

Witnesses:

WILLIAM ROBINSON,
BERT L. WEST.