J. L. OSGOOD.

TWIST DRILL.

APPLICATION FILED NOV. 12, 1908.

991,884. **Patented May 9, 1911.**

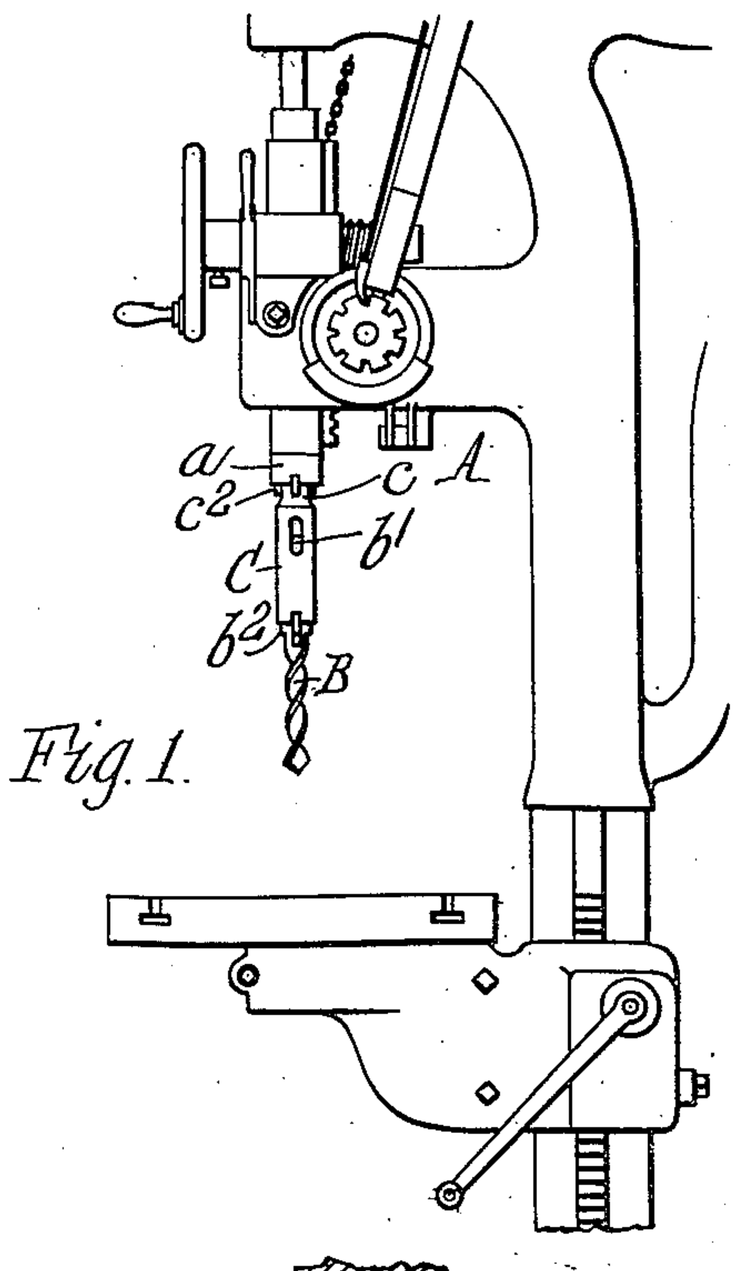

Fig. 1.

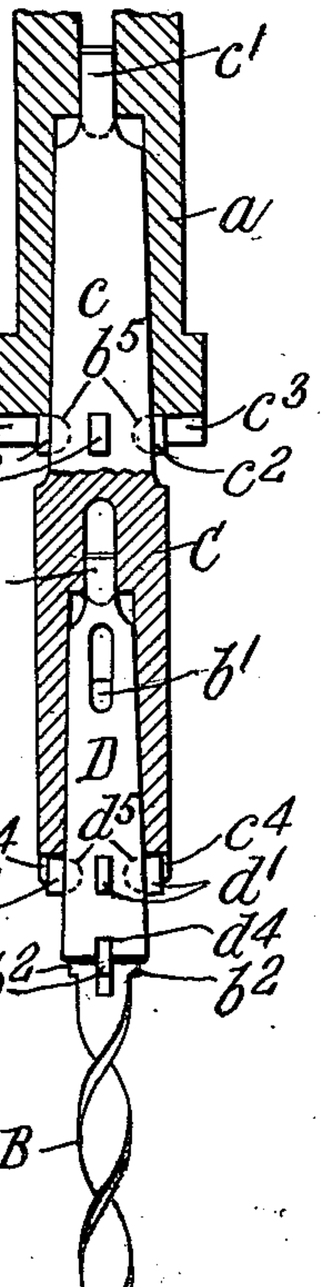

Fig. 2.

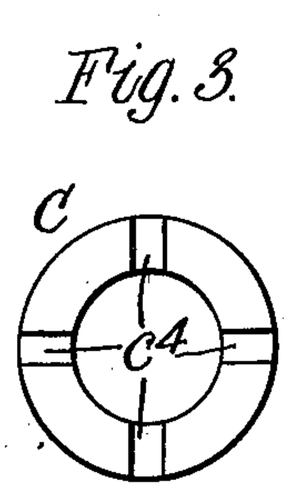

Fig. 3.

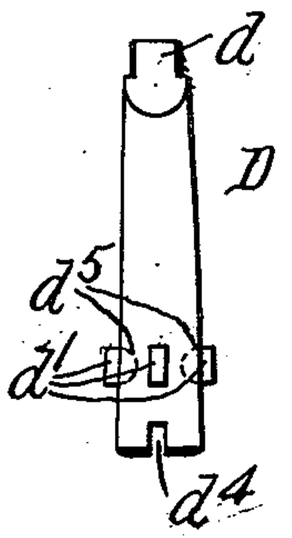

Fig. 4.

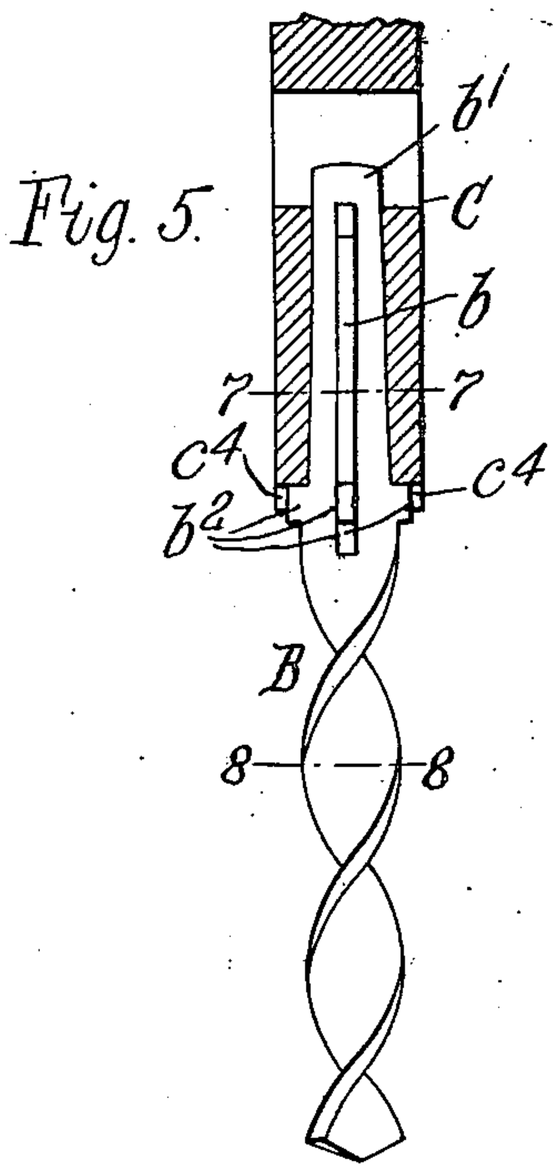

Fig. 5.

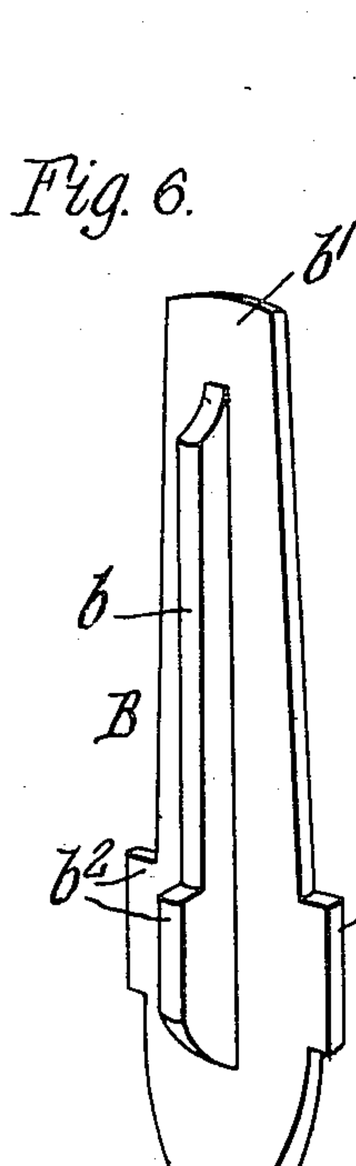

Fig. 6.

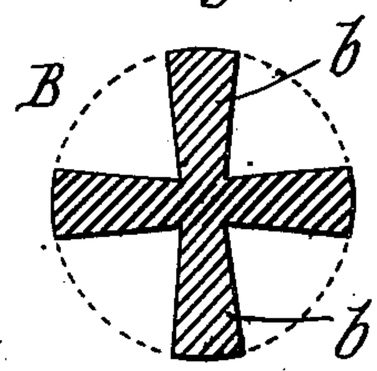

Fig. 7.

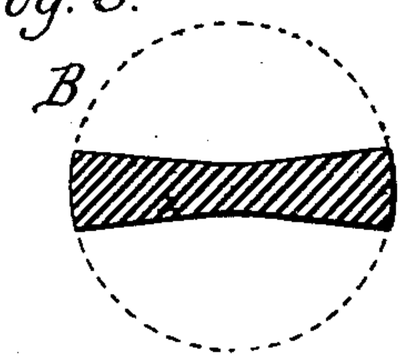

Fig. 8.

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UNITED STATES PATENT OFFICE.

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TWIST-DRILL.

991,884. Specification of Letters Patent. Patented May 9, 1911.

Application filed November 12, 1908. Serial No. 462,252.

To all whom it may concern:

Be it known that I, JOHN L. OSGOOD, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Twist-Drills, of which the following is a specification.

Twist drills intended for use in drill presses are commonly milled from solid stock and are provided with tapering or frusto-conical shanks having flat-sided end tangs adapted to fit in cavities of corresponding shape in the drill spindle, socket or sleeve for holding the drills and causing them to turn with the spindle. The driving power is thus communicated to the drills primarily through the tangs at their extremities, and the tangs, being necessarily of considerably less width and thickness than the diameter of the drills, are frequently twisted off or become so worn that they will not hold properly in the sockets. The socket has a similar shank by which it is detachably secured in the end of the drill spindle, and when it is desired to use a drill with a socket intended for a larger size drill, a sleeve or collet is employed which fits in the cavity of the socket and has itself a cavity similar to that of the socket in which the shank of the small drill fits. Thus by using sleeves of the proper sizes, drills of several different sizes can be used with a single socket.

The object of this invention is to produce a drill which is made by twisting a flat or rolled bar and has a shank adapting it to be used in the standard sockets and sleeves intended for the ordinary taper shank twist drills, by making an inexpensive alteration in the sockets and sleeves, and which provides a driving connection, supplemental to the end tang, between the drill and socket or other holder located at the outer or largest diameter of the drill.

In the accompanying drawings, Figure 1 is a fragmentary side elevation of a drill press equipped with a drill socket and drill embodying the invention. Fig. 2 is a fragmentary sectional elevation, on an enlarged scale, of a drill spindle, socket, sleeve and drill. Fig. 3 is an end view, on a still larger scale, of the socket. Fig. 4 is a side elevation of the sleeve detached. Fig. 5 is a fragmentary sectional elevation of the drill socket and drill. Fig. 6 is a fragmentary perspective view, on a larger scale, of the drill. Figs. 7 and 8 are transverse sections, on a still larger scale, of the drill, in lines 7—7 and 8—8, respectively, Fig. 5.

Like letters of reference refer to like parts in the several figures.

A represents a portion of a drill press of ordinary construction, and *a* the spindle thereof, B the drill, and C the drill socket which is detachably held in a cavity in the lower end of the spindle and holds the drill.

The drill B consists of a bar of substantially the shape in cross-section shown in Fig. 8, which is twisted except at one end which is left straight, and has separate strips *b* welded or otherwise permanently secured centrally on opposite sides thereof to form the drill shank. The strips *b* terminate short of the end of the straight shank portion so that the extremity *b'* of this portion forms a flat driving tang. After the strips are secured on the drill bar the drill is machined accurately to dimensions, the shank being tapered to fit a standard taper socket, and lateral driving projections b^2 being formed on the drill bar and strips *b* at the base of the shank.

The drill socket C, like the standard drill sockets, has a tapered shank *c* which fits in the tapered cavity in the drill spindle and terminates in the usual driving tang *c'* which enters the transverse slot at the inner end of the spindle cavity, but in addition the socket is preferably provided at the base or large portion of its shank with laterally-extending driving projections c^2, arranged correspondingly to the projections b^2 on the drill, which engage in slots c^3 formed in the end of the spindle *a*, and the lower end of the socket is provided with slots c^4 arranged to receive the driving projections b^2 on the drill. The shank of the drill being of cross-shaped section and tapered will center and fit snugly in the cavity of the socket with its tang *b'* engaging in the transverse slot of the socket the same as the frusto-conical shank of the ordinary drill, but the engagement of the projections b^2 on the drill in the slots c^4 of the socket furnish a driving connection between the socket and drill at the base of the shank and at the largest diameter of the drill, which greatly relieves the end tang *b'* from strain and, together with the tang, furnishes a very

strong and reliable drive. The end tang can be dispensed with and the driving projections alone used, if desired.

A small drill can be used in a socket for a larger drill by the use of a drill sleeve or collet D, such as used with standard taper shank drills and sockets, which receives the shank of the drill and fits in the socket. The sleeve D, as usual, is tapered to fit the tapered socket cavity and has the end driving tang d to engage in the transverse slot at the inner end of the socket cavity, but, like the socket C, it is provided in addition with laterally-extending driving projections d' to enter the end slots c^4 in the socket, and slots d^4 in its end to receive the driving projections b^2 on the drill. Thus a drill can be held in either the spindle, the socket or the sleeve, depending only upon whether the drill shank is of a size to fit one or the other, and the same sort of interlocking driving connection is provided between the drill and the part which receives it, and also between the sleeve and the socket and between the socket and the spindle.

When sockets and sleeves are specially made for the new drill described, the driving projections c^2 and d' are made integrally with the sockets and sleeves, but when it is desired to utilize sockets and sleeves already on hand the projections are formed by separate pieces driven into key seats b^5 and d^5 (indicated by dotted lines in Figs. 2 and 4) or secured to the sockets and sleeves in any other suitable way. The key seats for the driving projections and the slots c^3, c^4 and d^4 in the ends of the spindle, sockets and sleeves can be readily milled at small expense. The driving projections on the sleeve and socket are preferred, but if it is desired to rely on the usual end tangs for driving the socket and sleeve, the driving projections can be dispensed with, and in this case it is only necessary to mill slots in the ends of the socket and sleeve to adapt them to the new drill.

As the spindle, socket and sleeve in reality form corresponding sockets for different sizes of drills, and the drill is secured in one or the other, depending on the size of its shank, the term "socket" as used in the claims in this case will be understood where appropriate to mean either of these parts.

I claim as my invention:

1. A twist drill consisting of a twisted bar having a flat tapered shank portion and provided at its opposite edges substantially at the base of said shank portion with integral laterally-extending driving projections, and flat tapered shank strips extending longitudinally from the opposite sides of the shank portion, substantially as set forth.

2. A twist drill consisting of a twisted bar having a flat shank portion, and flat shank strips extending longitudinally at the opposite sides of said shank portion, said shank portion and shank strips being tapered and having integral laterally-extending driving projections substantially at the base thereof which are adapted to engage in slots in a drill socket, substantially as set forth.

3. A twist drill consisting of a twisted bar having a flat tapered shank portion, and separate flat shank strips which are secured to opposite sides of said shank portion and extend longitudinally thereof but terminate short of the end of said shank portion to form a driving tang at the end of the shank, said shank portion and said strips having converging edges provided substantially at the base thereof with integral laterally-extending driving projections adapted to engage in slots in a drill socket, substantially as set forth.

Witness my hand in the presence of two subscribing witnesses.

JOHN L. OSGOOD.

Witnesses:
C. W. PARKER,
C. B. HORNBECK.