

1,316,027.

Patented Sept. 16, 1919.
 3 SHEETS—SHEET 1.

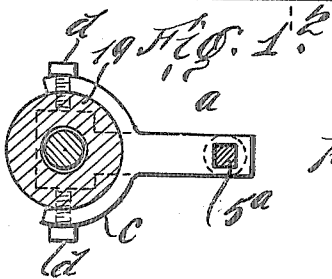
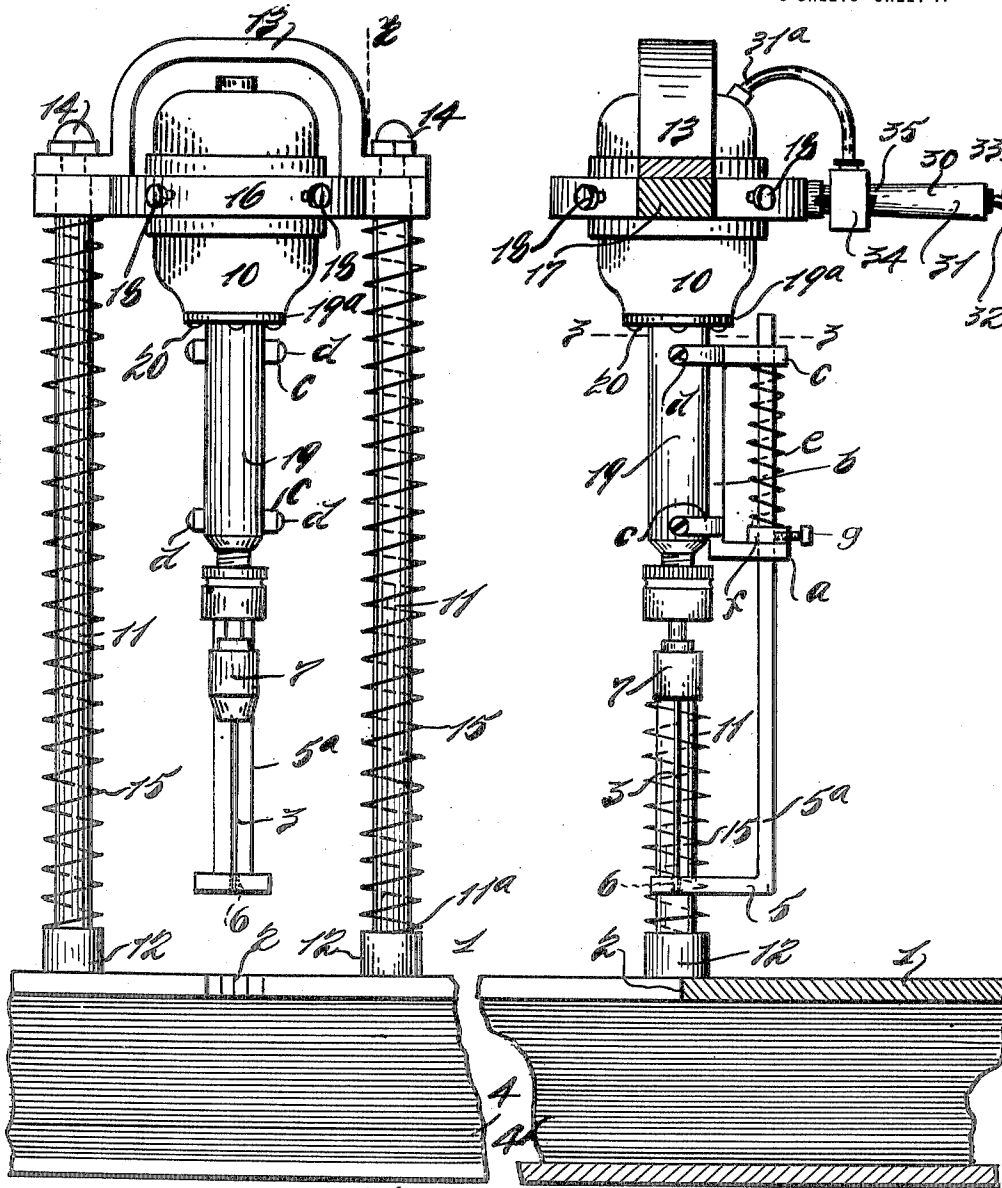


Fig. 5.

Fig. 2.

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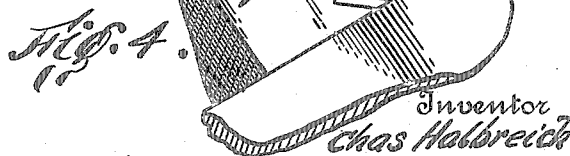
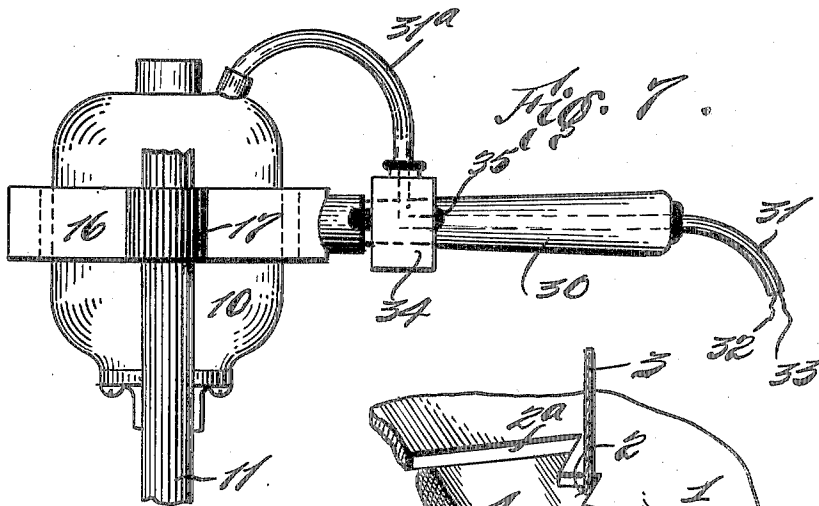
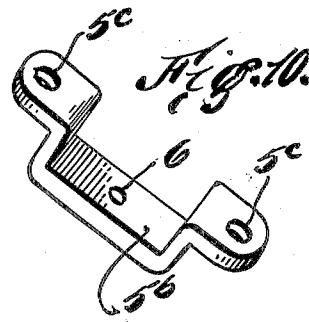
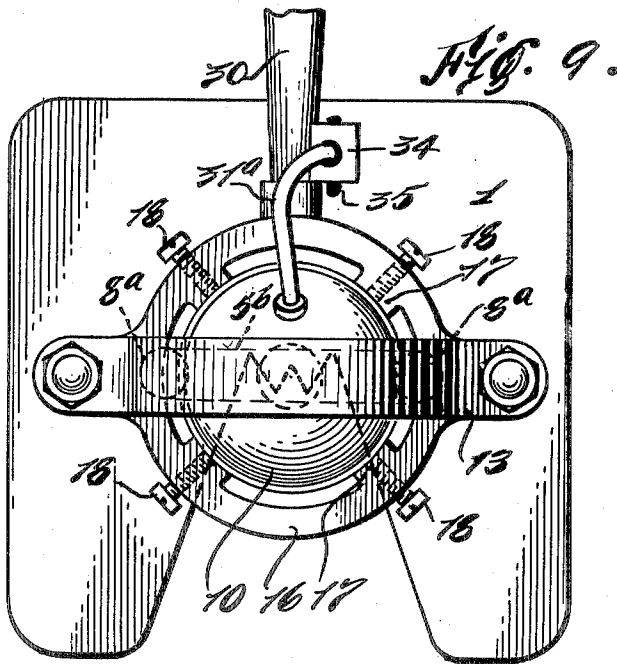
By his Attorney

T. F. Bourne

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 PORTABLE DRILL.
 APPLICATION FILED AUG. 29, 1917.

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 3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

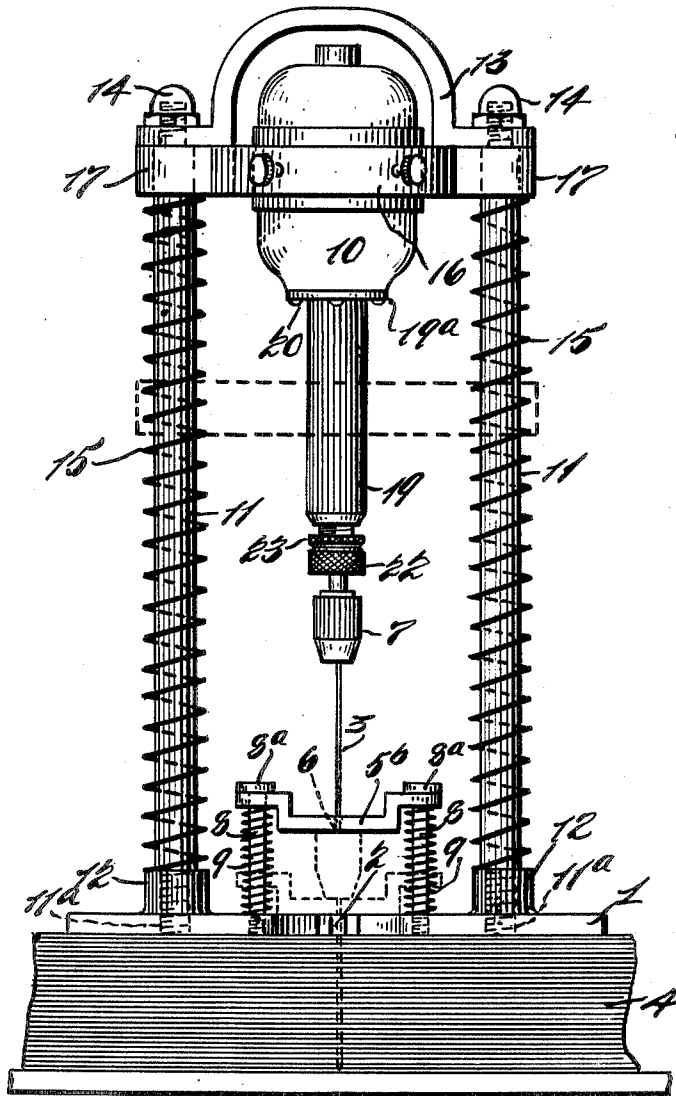


Fig. 8.

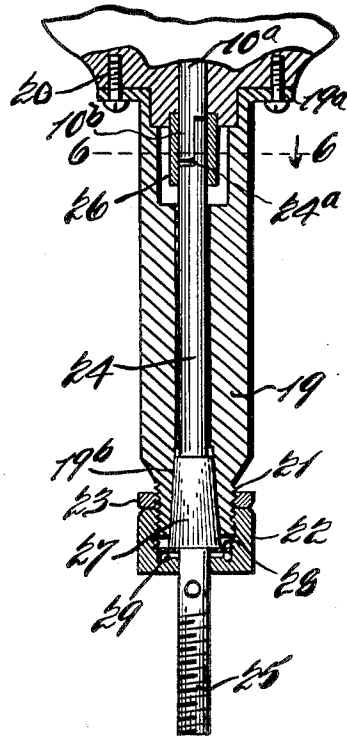


Fig. 5.

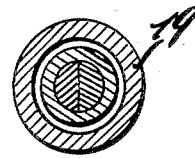


Fig. 6.

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UNITED STATES PATENT OFFICE

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PORTABLE DRILL.

1,316,027.

Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed August 29, 1917. Serial No. 188,716.

To all whom it may concern:

Be it known that I, CHARLES HALBREICH, a subject of Russia, and resident of Maywood, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Portable Drills, of which the following is a specification.

The object of my invention is to provide improvements in portable drills, and has particular reference to means for permitting the use of relatively long drills of small diameter, whereby the latter may be guided to the work accurately, while permitting ready view of the place at which the hole in the work is to be drilled; also to provide means for utilizing a relatively long tool-carrying spindle with bearings therefor spaced well apart to enable proper rotation of a relatively long drill at high speed; also to provide a portable drill having a base to be placed upon the work with means to guide a drill-operating motor to permit the drill to be readily moved toward and from the work and the motor to be accurately guided in its movement toward the work.

My invention is particularly adapted for drilling holes in stacked pieces of fabric, such as for marking numerous pieces of fabric similarly by drill holes therein, and according to a pattern, to indicate places where further work is to be done upon the pieces of fabric.

My invention also comprises novel details of improvement and combinations of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein:

Figure 1 is a front elevation of a portable drill embodying my invention;

Fig. 2 is a vertical section on the line 2, 2, in Fig. 1.

Fig. 3 is a cross section on the line 3, 3, in Fig. 2.

Fig. 4 is a fragmentary perspective view illustrating a portion of the base of the drill;

Fig. 5 is an enlarged vertical section of a portion of the motor and bearings for the drill spindle;

Fig. 6 is a cross section on the line 6, 6, in Fig. 5;

Fig. 7 is a side view of a portion of the drill;

Fig. 8 is a front view of a modification;

Fig. 9 is a plan view of the drill; and

Fig. 10 is a perspective detail view of the drill guide of Fig. 8.

Similar numerals and letters of reference indicate corresponding parts in the several views.

In the accompanying drawings the numeral 1 indicates the base of my improved portable drill, which may comprise a suitable flat relatively thin metal plate having an opening at 2 for the passage of a tool such as a drill 3 to the goods 4 to be drilled. The opening 2 is shown in V-like form cut into the edge of an enlarged opening at 2^a in base 1 (Fig. 4), whereby a mark on the goods 4 may be readily seen indicating where a hole is to be drilled in the goods. At 5 is a movable guide shown provided with a hole 6 for the passage of the drill 3, which guide is supported above base 1 in a resilient manner so that the guide may descend toward the base with the drill. In Figs. 1, 2 and 3 the guide 5 is carried by the hub portion 19 that projects from the frame of motor 10, said hub being shown provided with a flange 19^a secured to the lower end of the motor frame by screws 20. The guide 5 has an upwardly extending stem 5^a slidable in spaced guides *a* secured on hub 19 of the motor to rise and descend with the latter. The guides *a* are shown united by a brace *b*, and said guides and brace are shown forked at *c* to receive hub 19, screws *d* entering the hub serving to secure the forks to the latter. The stem 5^a is shown polygonal and slidably received in polygonal holes in guides *a* whereby guide 5 is kept from rotating. A spring *e* is shown coiled around stem 5^a (Fig. 2) and bears at one end against the upper guide *a* and at its lower end the spring bears against a collar or stop *f* on stem 5^a, being adjustably held thereto by a screw *g*. The stop *f* rests on the lower guide *a*, and thus retains guide 5 in proper position respecting the drill 3 and base 1. When the motor descends with the drill, guide 5 will guide the drill and when the guide engages the base the motor and drill can continue to descend since the stem 5^a will slide in guides *a*, and when the motor and drill rise the stop *f* will again engage the lower guide *a* and the drill guide

5 will be raised from the base. The guide permits the use of long drills, and if the drills are or become shorter the screw *g* may be turned back, the stem 5^a may be adjusted
 5 along stop *f*, and the screw reset, and thus the guide 5 will be adjusted higher to accommodate the short drill. In the modification shown in Figs. 8 and 10 the drill
 10 guide 5^b is movably mounted on the base 1 to be pushed down toward the goods by the chuck or drill holder 7. I have shown base 1 provided with spaced guiding posts 8 suitably secured to and projecting upwardly from said base, said guide 5 being shown
 15 provided with spaced guiding apertures 5^c receiving said posts (Fig. 10). The posts 8 have stops or heads 8^a at their upper ends, to limit the upward movement of guide 5, and at 9 are springs interposed between the
 20 guide and the base tending normally to raise the guide from the base against the stops 8^a. The posts 8 may be in the form of headed screws threaded into the base. The central portion of guide 5 is depressed below the
 25 side portions having the apertures 5^c against which the springs 9 operate, whereby the central drill-guiding portion of the guide may be depressed by chuck 7 close down toward the goods 4, without inter-
 30 ference by springs 9. In either form the guide is normally at a suitable height above the base so as to guide the drill when it is at the limit of its upward position, and to guide the drill while being lowered, and
 35 whereby as the motor descends the guide will be pushed down to the base, whereby the guide continues to guide the drill. By this means a relatively long drill of small diameter may be properly utilized and
 40 nearly the full length of the drill may be used for the goods. A particular utility of my improved portable drill is that it may be used upon stacks of webs, such as cloth, silk or the like, containing numerous layers
 45 thereof so that each of the layers may be marked by drilling through the same in the same relative positions as respects markings placed upon the top layer by means of
 50 in marking layers of fabric for the manufacture of different kinds of clothing.

The drill 3 may be operated in any suitable manner in conjunction with the drill guide. The base 1 is shown provided with
 55 spaced uprights 11 adapted to guide the motor 10, the posts 8 and guide 5 being shown located between the uprights 11. Said uprights may be secured to the base in any suitable manner, such as by threading the
 60 lower ends of the uprights at 11^a and screwing them into threaded hubs 12 on the base. At 13 is a brace at the upper ends of uprights 11 to secure them firmly together. Said brace may have holes at its ends re-
 65 ceiving threaded ends of the uprights 11,

upon which threaded ends nuts 14 are provided. The threaded upper ends of the uprights by being reduced in diameter provide shoulders against which the ends of brace
 13 are forced by the nuts 14 for rigidly 70 holding the parts together. At 15 are coiled springs interposed between base 1 and a frame 16, to which the motor is attached. Said frame is shown provided with projecting end portions at 17, having apertures
 receiving and slidable along uprights 11, the springs 15 serving to normally raise frame 16 and the motor and to permit the depression of the latter. I have shown said
 80 frame in ring or annular form (Fig. 9) adapted to receive the motor therein, the inner portion of such ring being shown provided with spaced lugs 17 opposing the motor frame, which fits adjustably therein,
 screws at 18 threaded through the frame 16 85 and the lugs 17 serving when screwed against the motor frame to properly center the same with respect to the hole 6 of guide 5 with respect to the opening 2 of the base, and to securely hold the motor in frame 16. 90
 By the means described the motor may be depressed against the tension of springs 15 to present drill 3 to the work, and when the motor is released said springs will raise the motor and the drill from the work. 95

In order to properly and accurately guide and rotate the drill 3 from the motor shaft 10^a, in such a manner as to resist the tendency of the drill under high speed to rotate irregularly, I provide the following means: 100
 The lower end of hub 19 is shown threaded at 21 to receive an internally threaded cap 22 and a lock nut 23 (Fig. 5). A relatively long spindle 24 is adapted to extend through the bore of hub 19. The lower end of said
 105 spindle is shown threaded at 25 to cooperate with the chuck 7 for holding the chuck adjustably upon the spindle in a well-known manner for securing the drill 3 to the chuck. The upper end of spindle 24 is detachably 110
 coupled to the motor shaft 10^a, for which purpose I have shown said shaft reduced at 10^b to cooperate with the correspondingly reduced portion 24^a of spindle 24, said reduced portions of said shaft and spindle 115
 being shown retained in a bearing or bushing 26 secured at the lower end of the motor frame, whereby as the shaft 10^a is rotated the spindle 24 with the chuck 7 and drill 3 will be rotated. The spindle 24 is shown 120
 provided with a cone-like portion 27 near its outer end cooperative with a corresponding cone-like portion 19^b of the hub 19, whereby the spindle is accurately centered. A washer at 28 is provided on spindle 24 to 125
 bear against the lower end of the cone-like portion 27 and anti-friction bearings at 29 are shown interposed between the cap 22 and said washer 28. By the means described the spindle 24 may be readily detached and 130

replaced and will be accurately centered by reason of the bearing portion 27 located at a considerable distance from the bearing at the connection of the spindle and the motor shaft. Also, by having threaded portion 25 for the chuck upon a relatively long spindle, and the bearings for the spindle well spread apart to accurately guide the spindle, its high rotation is permitted whereby the long drill 3 is the more accurately guided and rotated, and by having the threads 25 for the chuck upon the long spindle the latter is removable with its chuck and chance for vibration between the chuck and the motor shaft is reduced.

The frame 16 is shown provided with a handle 30 projecting from one side thereof and suitably secured thereto, whereby the motor may be depressed and raised on the guiding uprights 11. An electric conductor, such as in the form of a cable, indicated at 31, adapted to communicate with a source of electrical supply, is shown passing through the handle 30 and the conductors 32, 33 terminate in a switch box 34, that is secured to said handle in convenient position for operation of the switch member 35. The cable continues from the switch box to the terminals of the motor at 31^a. By the means described the operation of the motor is facilitated, and may be readily controlled by the operator, and the switch box is not liable to get out of order owing to its firm connection with the handle 30.

My improved portable drill may be placed upon a stack of goods with the drill over a marking thereon, such as a mark made from a pattern, and the motor may be readily depressed to cause the drill to enter the goods, the guide 5 serving to guide the drill in its various positions of depression, and the guide will be depressed close down to the goods, thereby continuing to guide the drill to its lowest movement. Such construction is of advantage where webs of fabric in a stack are being drilled so as to prevent the tendency of a long drill to cause movement of the webs relatively one to the other. A further advantage of my improvements is that the base 1 may be readily moved around and placed upon different parts of the goods according to the markings thereon, and the weight of the device, in addition to the downward pressure during the operation of the motor, will serve to aid in holding the stack of goods in firm position for drilling.

Having now described my invention what I claim is:—

1. A portable drill comprising a relatively large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base to support the motor for movement toward

and from the top of the base over said opening, means to attach a drill to the motor shaft, and a guide for the drill movably supported between the base and the motor for movement with relation to the base, the motor and the drill.

2. A portable drill comprising a relatively large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base to support the motor for movement toward and from the top of the base over said opening, means to attach a drill to the motor shaft, a guide for the drill between the base and the motor opposing the tool attachment, and means movably supporting the guide to be moved with the drill toward the base, and to permit independent movement of the drill with relation to the guide.

3. A portable drill comprising a relatively large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base to support the motor for movement toward and from the top of the base over said opening, means to attach a drill to the motor shaft, a guide for the drill between the base and motor, means movably supporting the guide from the motor to move therewith toward and from the base, and means permitting the motor and drill to move separately from the guide whereby the drill may pass through the guide and the base when the guide is on the base.

4. A portable drill comprising a relatively large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base to support the motor for movement toward and from the top of the base over said opening, means to attach a drill to the motor shaft, a guide for the drill located between the base and the motor and having an upwardly extending stem, guiding means for the stem carried by the motor above the base, and a spring normally depressing the guide and permitting the motor and drill to move relatively to the base and the guide whereby the drill may move through the guide and the base when the guide is on the base.

5. A portable drill comprising a relatively large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base to support the motor for movement toward and from the top of the base over said opening,

means to attach a drill to the motor shaft, a guide for the drill located between the base and the motor and having a stem, guides for the stem carried by the motor
 5 above the base, a stop on the stem, and a spring coacting with said stop to normally depress the guide toward the base, the motor, drill and guide being movable together toward and away from the base, the motor and drill being movable independently
 10 of the guide whereby the drill may pass through the guide and base when the guide is on the base.

6. A portable drill comprising a relatively
 15 large flat base having an extended smooth lower surface to rest upon a stack of goods to be drilled, said base being provided with an opening for a drill, a motor, means extending upwardly from the top of the base
 20 to support the motor for movement toward and from the top of the base over said opening, means to attach a drill to the motor shaft, a guide for the drill located between the base and the motor and having a stem,
 25 spaced guides for the stem carried by the motor above the base, a stop on the stem between the spaced guides to cooperate with

one of them, means to secure the stop to the stem to normally retain the guide in adjusted position relatively to the drill and the
 30 base, and a spring around the stem coöperative with said stop and with one of the spaced guides to normally depress the drill toward the base, the motor, drill and guide being movable together toward and away
 35 from the base, the motor and drill being movable independently of the guide whereby the drill may pass through the guide and base when the guide is on the base.

7. The combination of a motor having a
 40 shaft having a reduced end, and an extended hub registering with the shaft, a spindle having a reduced end for coöperation with said reduced end of the motor shaft for rotation
 45 thereby, a bushing receiving the reduced ends of said shaft and spindle retaining them in coöperative relation, a bearing for the spindle adjacent to its outer end, a chuck, and means to operatively connect the chuck
 50 with the spindle.

Signed at New York city, county and State of New York, this 28th day of August, 1917.

CHARLES HALBREICH.