

1,022,711.

UNITED STATES PATENT OFFICE.

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DRILL MAGAZINE AND CHUCK.

1,022,711.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WELCOME F. SWEET, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain
5 new and useful Improvement in Drill Magazines and Chucks, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view of my improved device. Fig. 2 is a cross sectional
15 view taken substantially on the line *a—a* of Fig. 1. Fig. 3 is a detached view of the mandrel showing a slight modification. Fig. 4 illustrates a portion of the device in section. Fig. 5 is a vertical section taken
20 through the lower end of the preferred form of the mandrel used in connection with my improved magazine and chuck.

My invention relates to an improvement in a magazine and chuck for drills to be
25 used more especially in connection with an ordinary drill press. It is the common occurrence in shops where small tools are used that these tools are often misplaced and therefore considerable time is required to
30 find them.

It is the object of my improvement to provide a magazine in which a number of different sizes of drills are retained and which
35 may be applied to a drill press in such a manner that any special drill may be positioned in the mandrel of the press whenever desired.

Referring to the drawings 1 indicates the ordinary mandrel with tapering shank 2 to
40 be positioned within the drill press. 3 is a cylindrical portion of the mandrel having a projecting pin 4 at one side thereof. Extending from the cylindrical portion 3 is a threaded portion 5 of smaller diameter
45 than the portion 3 and connected thereto by means of a conical portion 6.

The mandrel and especially the portions 3, 5, and 6 is split by means of a slot 7 passing therethrough having a smaller slot 8
50 connected at one end thereof, and a similar slot 9 at the opposite end forming shoulders 10 between the slots 7 and 8 and shoulders 11 between the slots 7 and 9. The slots 8 and 9 are of less width than the slot 7 and
55 the slot 8 as shown in Fig. 1 extends from a point near the top of the cylindrical por-

tion 3 in a substantially curved line to a point intersecting the top of the slot 7. Surrounding this cylindrical portion 3 of the
60 mandrel is a slidable sleeve 12 having a slot 13 at one side in which the pin 4 is positioned. Opposite this slot 13 is a pivoted ejector member 14 mounted in a slot in the sleeve 12, which is pivoted on a pin 15 so
65 that its upper end swings in the slot 8 and extends down through the slots 7 and 9 as shown, for example in the dotted line position in Fig. 1. This ejector member 14 is
70 operated by a rod 16 connected with lugs 17 on the ejector member and extending to a head 18 on the outside of the magazine casing.

At its upper end the sleeve 12 is exteriorly screw threaded for the reception of a
75 cap 19 through which the operating rod 16 passes. A supporting bracket 20 is suitably connected to the cap piece 19 and extends out to one side of the casing with a slot 21 therein having a cross pin 22 upon which
80 is slidably mounted a pusher 23, which pusher has a slot 24 inclosing the pin 22.

The sleeve 12 is provided with projecting portions 25 and 26 as shown in Fig. 4. The
85 portions 25 and 26 are slotted of the same width as the slots 8 and 9 in the mandrel, and at the side thereof directly in front of the slots in the mandrel. If desired, however, the slots may be all of the same width as the slot 7 in the mandrel.

Surrounding the sleeve 12 is the magazine
90 casing comprised of three separate pieces, the upper 27, intermediate 28 and lower 29. The upper section 27 fits upon the cap 19 so as to rotate thereon, and has a projecting portion or flange 30 which is
95 slotted entirely around the periphery for the reception of a number of drill heads. This section 27 extends down and is supported on the intermediate piece 28 which has a projection 31 interior of the casing 27.
100 The intermediate section 28 also has a flange 32 which is slotted in a similar manner to flange 30 with radial slots extending all around the periphery for the reception of the shanks of a series of drills. The upper
105 portion of this flange 32 is suitably beveled as indicated at 33. The flanges 30 and 32 are positioned at the same altitude in the chuck as the flanges 25 and 26 on the sleeve 12.

The lower portion of the casing 29 is made
110 of pyramidal form having an upper bear-

ing surface 34 for the intermediate section 28 and also serves as a support therefor. At its lower end the pyramidal section 29 is rotatably mounted on the sleeve 12. The sleeve 12 at the lower end has an outstanding flange 35 forming a support for a rotatable ring 36 with a projecting flange 37 extending between the flange 35 on the sleeve and the lower end of the section 29. The lower end of the sleeve 12 is also provided with an interiorly projecting inclined or tapered lug 37'. The ring 36 is suitably connected by screws or otherwise to a nut member 38 which is provided with opposite interior lugs 39, and has a tapered portion 40 interior thereof for engaging the portion 6 of the mandrel.

Mounted within the magazine casing are a series of drills 41 of various sizes and sorts upon the inclined faces 33 of the flanges 32. These drills being arranged around the entire periphery of the magazine as illustrated in Fig. 2 with their inner ends substantially abutting. The heads of these drills are of suitable shape to fit within the slot 7 and also between the flanges 30 and 32 of the outer casing. If desired the upper portion of said head may be made of smaller section to fit within the slots in the flanges 25 and 30, and also within the slot 8. The slots in the flanges 26 and 32 are made large enough to accommodate the various sizes of drill shanks, so that these drills may be positioned within the magazine as shown in Fig. 1.

The sections 27 and 28 of the outer casing are suitably slotted for the reception of the pusher member 23 opposite each drill and the bracket 20 is at a distance from the casing to allow the withdrawal of the pusher from the slot in the casing. This slot is also of suitable shape to allow the pusher being inserted in the dotted line position shown in Fig. 1, where it will be out of the way when the drill is in use.

When it is desired to insert a drill into the mandrel of a certain size the pusher is withdrawn and the outer casing of the magazine rotated until the proper drill is positioned in front of the bracket 20 and pusher 23. If desired the position of the various drills in the magazine may be indicated by numerals or otherwise on the periphery of the casing 27. The pusher 23 is then operated to push the drill head and shank within the slot of the split mandrel in the dotted line position of Fig. 1. The pusher may then be withdrawn and placed in the dotted line position shown in Fig. 1, and the whole chuck raised to the dotted line position of this figure, when by rotation of the nut 38 the lugs 39 thereon engage the threaded portion of the mandrel 5 tending to clamp the head of the drill by drawing together the two split portions of the mandrel. The

inclined portion 37' is brought into engagement with the front of the drill head to also aid in clamping the drill in position. After the drill has been used the nut is unscrewed and the chuck dropped.

To eject the drill from the mandrel and to return said drill to its proper position within the housing, the head 18 on the upper end of the rod 16 is engaged and pulled upward thereby swinging the upper portion of the ejector member 14 inward as shown by the dotted lines in Fig. 1, and the upper end of said ejector member engages against the head of the drill and pushes the same out of the slot 17 and forces said head into its normal position within the drill housing.

In order to cause the return of the ejector member 14 to its normal position as shown by full lines in Fig. 1, and to normally maintain said member in such position, a retractile coil spring is arranged on the rod 16 between the head 18 and the housing, and the ends of which retractile spring are connected to said head and housing.

If for any reason a drill is broken or needs sharpening it may be removed by unscrewing the cap 19, which leaves room for the withdrawal of the drill or insertion of a new drill.

I have also shown in Fig. 3 a slight modification in providing a bored section 42 made large enough to accommodate any drills of a larger size than could be placed within the magazine of the chuck, so that a larger sized drill could be used without removing the magazine from the drill press.

It is to be understood that the slot 7 of greatest width extends only substantially a little way beyond the center of the mandrel so as to form a shouldered backing for the drill head when in position within the mandrel, and that the inclined portion of the sleeve 37' bears against the opposite side of the head in order to clamp the head firmly in proper position. This clamping action is an addition to that produced by the screwing of the nut on the mandrel, whereby the two portions of the mandrel are drawn together.

It is also to be noted that some of the parts as, for example, section 29 and ring member 36 are formed in two parts in order to be easily manufactured and placed upon the other parts of the device.

Although I have referred to the tools mounted in the magazine as drills, I do not intend to be limited thereto, but mean to include any tools which may be inserted within the mandrel to be operated by a rotary movement, such as punches, counter-sinks and bores, screw drivers, etc.

I am aware that minor changes may be made in the construction, arrangement and combination of the various parts of my device without departing from the nature and

spirit of my invention, the scope of which is indicated in the accompanying claims.

I claim:

1. In a device of the character described, a mandrel having a slot therein, a magazine for drills supported by said mandrel, a series of drills mounted in the magazine, means whereby a drill may be inserted in the slot in the mandrel and means for ejecting the drill from the mandrel.

2. In a device of the character described, a mandrel having a slot therein, a drill magazine supported by said mandrel, a series of drills mounted in said magazine radially of the mandrel, means whereby said magazine may be rotated to present a drill in position in front of the slot in the mandrel, and means for inserting the drill in the slot in the mandrel.

3. In a device of the character described, a mandrel having a slot therein, a drill magazine supported by said mandrel, a series of drills mounted in said magazine radially of the mandrel, means whereby said magazine may be rotated to present a drill in position in front of the slot in the mandrel, means for inserting the drill in the slot in the mandrel, and means for clamping said drill in position in the mandrel.

4. In a device of the character described, a mandrel having a slot therein, a drill magazine mounted on the mandrel, comprising means for retaining a series of drills in position, means for inserting a drill within the mandrel, means for clamping said drill in position in the mandrel and means for ejecting the drill from the mandrel.

5. In a device of the character described, a slotted mandrel, a rotatable magazine mounted on said mandrel adapted to position a series of drills radially thereon, and a pusher mounted on a fixed support adapted to insert a predetermined drill within the slot in the mandrel.

6. In a device of the character described, in combination, a slotted mandrel, a rotatable magazine mounted on said mandrel adapted to position a series of tools radially thereon and opposite the slot in the mandrel, and an ejector for withdrawing a tool from the mandrel to place it within the magazine.

7. In a device of the character described, a slotted mandrel, a rotatable magazine mounted on said mandrel adapted to position a series of drills radially thereon, a pusher mounted on a fixed support adapted to insert a predetermined drill within the slot in the mandrel, and a pivoted ejector for withdrawing the drill from the mandrel.

8. In a device of the character described, a slotted mandrel, a drill magazine mounted thereon comprising means for retaining in position a series of drills radially of the mandrel, means for inserting a drill within the slot in the mandrel, means whereby the

magazine may be moved longitudinal of the mandrel, and means on the magazine for clamping the drill in position in the mandrel.

9. In a device of the character described, a slotted mandrel having an external screw thread thereon, a drill magazine adapted to position a series of drills therein, means for rotating said magazine to present any desired drill in front of the slot of the mandrel, means for inserting the drill within the slot in the mandrel, means for moving the magazine longitudinally of the mandrel, and means for engaging the screw threaded portion of the mandrel to hold the magazine in position.

10. In a device of the character described, a slotted mandrel, a drill magazine mounted thereon comprising a sleeve portion longitudinally movable on the mandrel, means for retaining a series of drills in position in the magazine, means for rotating said magazine about the sleeve to position any desired drill in front of the slot in the mandrel, means mounted on the sleeve for inserting a drill within the mandrel.

11. In a device of the character described, a slotted mandrel, a drill magazine mounted thereon comprising a sleeve portion longitudinally movable on the mandrel, means for retaining a series of drills in position in the magazine, means for rotating said magazine about the sleeve to position any desired drill in front of the slot in the mandrel, means mounted on the sleeve for inserting a drill within the mandrel, and means mounted on the sleeve for ejecting the drill from the mandrel.

12. In a device of the character described, a slotted mandrel, a drill magazine mounted thereon comprising a sleeve portion longitudinally movable on the mandrel, means for retaining a series of drills in position in the magazine, means for rotating said magazine about the sleeve to position any desired drill in front of the slot in the mandrel, means mounted on the sleeve for inserting a drill within the mandrel, and means mounted on the sleeve for clamping the drill within the mandrel.

13. In a device of the character described, a slotted mandrel, a pin projecting therefrom, a sleeve surrounding said mandrel, having a slot embracing the pin on the same, a cap attached to said sleeve, a casing rotatably mounted on the sleeve and cap, and means in the casing for supporting a series of drills.

14. In a device of the character described, a slotted mandrel, a pin projecting therefrom, a sleeve surrounding said mandrel, having a slot embracing the pin on the same, a cap attached to said sleeve, a casing rotatably mounted on the sleeve and cap, means in the casing for supporting a series of

drills, a bracket supported on the cap, and a pusher on the bracket adapted to insert a drill within the mandrel.

- 15 In a device of the character described, a slotted mandrel, a drill magazine having means for supporting a series of drills therein, means for rotating said magazine about the mandrel, means extending exteriorly of the magazine for inserting any desired drill
10 within the slot in the mandrel.

16. In a device of the character described, a slotted mandrel, a drill magazine having means for supporting a series of drills there-

in, means for rotating said magazine about the mandrel, means extending exteriorly of the magazine for inserting any desired drill within the slot in the mandrel, and means operated exteriorly of the magazine for ejecting the drill from the mandrel. 15

In testimony whereof I hereunto affix my signature in the presence of two witnesses, this 19th day of October, 1910. 20

WELCOME F. SWEET.

Witnesses:

M. P. SMITH,

J. W. CLIFT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
