

(No Model.)

J. RIDDELL.
TAPPING HEAD.

No. 567,793.

Patented Sept. 15, 1896.

FIG. 1.

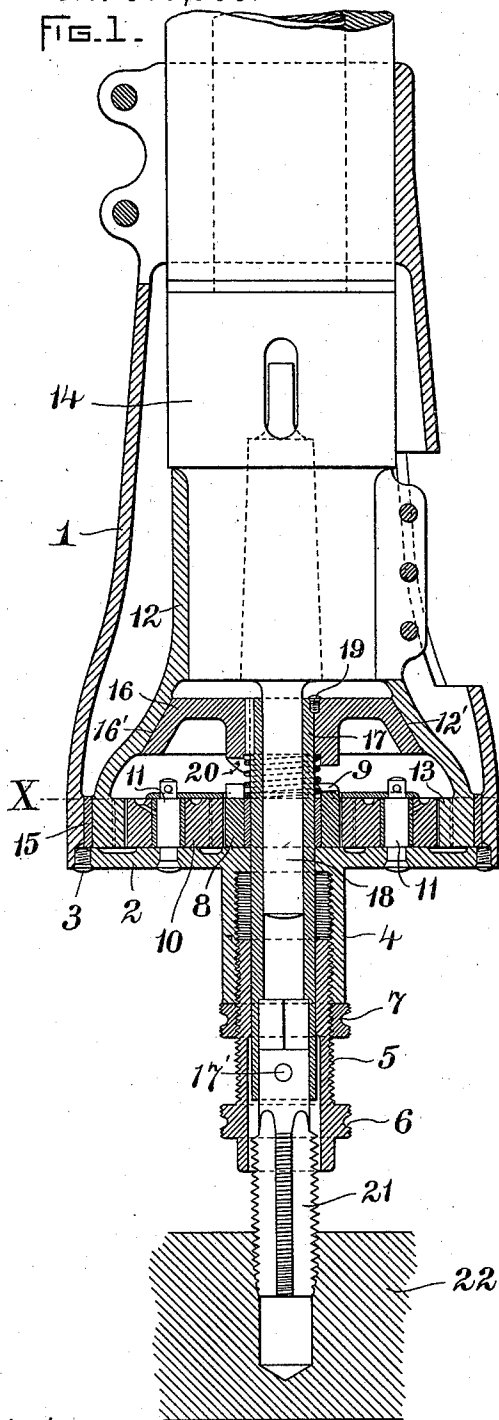


FIG. 3.

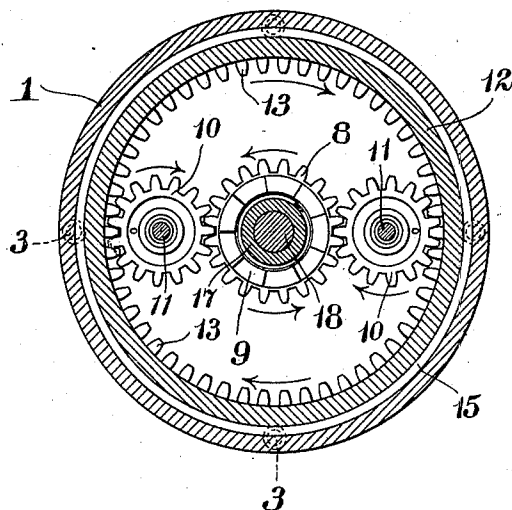
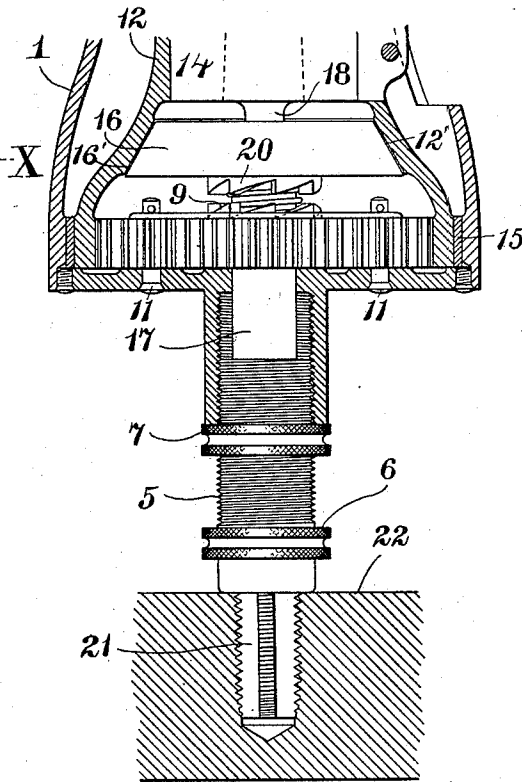


FIG. 2.



WITNESSES.

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TAPPING-HEAD.

SPECIFICATION forming part of Letters Patent No. 567,793, dated September 15, 1896.

Application filed April 6, 1896. Serial No. 586,318. (No model.)

To all whom it may concern:

Be it known that I, JOHN RIDDELL, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Tapping-Heads, (Case No. 296,) of which the following is a specification.

This invention relates to tapping-heads adapted to be used with the spindles of drill-presses or other machines, and has for its object to provide a quick-return tapping-head, by means of which the tap will automatically stop upon meeting an obstruction or when the thread is completed, and by means of which also the tap may be quickly withdrawn when the thread is completed.

The invention consists in a quick-return tapping-head for drilling purposes, and in details thereof, constructed and arranged as hereinafter set forth and claimed.

Referring to the accompanying drawings, in which similar figures of reference refer to like parts, Figure 1 is an elevation in vertical section of a tapping arrangement constructed in accordance with this invention. Fig. 2 is a view similar to that in Fig. 1, showing the lower portion of the device in the position when the thread has been completed; and Fig. 3 is a horizontal section on the line X X of Fig. 1.

To illustrate the manner of carrying out the invention, I provide a case 1, preferably of cone shape, as shown, which is secured to the quill or spindle of an ordinary drill-press or other machine and has its bottom formed with a removable plate 2, secured in place by screws 3 or in any other suitable manner. The plate 2 is formed with a central depending internally-screw-threaded cylindrical projection 4, with which engages a screw-threaded tubular projection 5, having a fixed knurled grip 6 adjacent to its outer end and a loose thumb-nut 7 abutting against the lower end of the cylindrical projection 4. This latter construction is well known and is used as a gage to determine the depth of the hole to be tapped.

Upon the upper side of the plate 2 is located a central gear-wheel 8, having its upper part formed with a clutch 9, the wheel 8 meshing with gear-wheels 10, mounted on the pivot-

pins 11, secured in the plate 2. The gear-wheel 8 is mounted upon a central tubular socket, as hereinafter set forth.

Within the case 1 is located a case 12, similar in form to the case 1 and having the preferably tapering portion 12' and its lower end resting on the plate 2 and provided with the internal gear-teeth 13, engaging with the gear-wheels 10. The case 12 is secured to a rotary spindle 14 of an ordinary drill-press or other machine. A brass lining 15 is located between the lower ends of the cases 1 and 12 for the purpose of diminishing friction between the rotary case 12 and the fixed case 1.

16 is a friction-clutch section located within and adapted to clutch with the case 12, as shown, and having a preferably tapering portion 16'. The clutch-section 16 is provided with a downwardly-extending tubular socket 17, which extends down through the aperture in the center of plate 2 and serves as a receptacle for the central spindle 18, which is secured in a socket in the spindle 14, as shown in dotted lines in Fig. 1, and is for the purpose of guiding the revolving parts of the attachment. The socket 17 and clutch-section 16 are preferably made in two parts to facilitate making and keeping in repair, and are secured together by means of a screw 19 or in any other suitable manner. If the socket 17 or clutch-section 16 should be damaged, by being made in two pieces it would only be necessary to remove one of them for purposes of repair. The gear-wheel 8 is mounted on the tubular socket 17. The clutch-section 16 is also formed with the central clutch-section 20, adapted to engage with the clutch-section 9 on gear-wheel 8. Between the clutch-sections 20 and 9 is inserted a coil-spring 21', encircling the socket 17 and serving the purpose of keeping the clutch-sections 20 and 9 out of gear and preventing the tap from revolving when not in actual use. The coil-spring is of such strength as to support the weight of the tap and the friction-cone 16, and its tension is such that it does not press the cone 16 against the section 12.

21 indicates the tap, projecting into the tubular projection 5 and secured in place in the lower end of the socket 17 by means of a screw or pin 17' or other suitable fastening. The tap 21 is directly driven by the friction-

clutch 16 when it is moved into engagement with the casing 12.

22 indicates the piece which is to be tapped, and in Fig. 1 the device is shown in position when the tap 21 is in operation and has partly entered the piece 22.

In Fig. 2 the parts are shown in position when the thread has been completed and the lower end of the gage has encountered the piece 22. In the normal position of the tapping-head, that is to say, when the device is not in use, the tapering portion 12' of case 12 will not be in contact with the tapering portion 16' of clutch-section 16, similarly to the relative position of these parts as indicated in Fig. 2.

The operation of the device is as follows: The tap being let down, when it comes in contact with the piece to be tapped downward pressure forces the friction-clutch section 16 against the case 12, which, revolving with the spindle of the press, revolves the tap. Of course a larger tap will require more pressure than a smaller one. By means of this construction of clutch the tap is prevented from breaking if it should in any way get caught, since, the tap being held by any obstruction, the friction-clutch 16 will be held and the case 12 will revolve thereon. During the operation of tapping, the gear-wheels 8 and 10 will be rotated by the rotation of the case 12 and the clutches 20 and 9 will be held apart by means of the coil-spring and the downward pressure. The tubular projection 5 being adjusted to gage the depth of the hole to be tapped, when, during the operation of tapping, the projection 5 is brought in contact with and bears against the material being tapped the casing 12 is lifted out of contact with the clutch-section 16 and the tap 21 is no longer driven and stops.

To reverse the tap, the machine is fed upward just as in withdrawing the drill after drilling a hole. This upward motion places the clutch-sections 20 and 9 in engagement, thus reversing the motion. The reverse motion is two and one-half times the speed of the spindle 14.

While the clutch 16 is preferably made a friction-clutch on account of the extra safety

it offers, it may be formed with a positive clutch adapted to engage with a positive clutch on the case 12. By means of this device the danger of injuring the tap from meeting an obstacle is avoided and the tapping-head can be quickly returned.

What I claim is—

1. A tapping-head for drill-presses, or other machines, having a fixed casing adapted to be screwed to the quill of a drill-press, a rotary casing within said fixed casing and adapted to be secured to the rotary spindle of a drill-press, and provided with inner circular gear-teeth, in combination with a clutch-section normally out of engagement with the rotary casing, said clutch-section adapted to be held by pressure in engagement with said rotary casing, a tap secured to said clutch-section, a second clutch-section provided with gear-teeth, a train of reversing gear-wheels connected with the teeth on said second clutch-section, and with the teeth of the rotary casing, and mounted in the fixed casing, said second clutch-section being adapted to be moved into engagement with said clutch-section, which engages with the rotary casing, and by the upward feed of the machine to reversely operate the gearing mechanism and quickly return the tap, as set forth.

2. The combination with the rotary spindle of a drill-press, or other machine, of a fixed casing screwed to the quill of the drill-press, a rotary casing screwed to the rotary spindle, a clutch-section normally out of engagement with said rotary casing and adapted to be moved into and held in engagement with said rotary casing, a tap secured to said clutch-section, and a train of gearing mounted in the fixed casing and geared to the rotary casing and adapted to be moved into engagement with the said clutch-section and tap on the upward feed of the machine, to quickly return the tap, as herein set forth.

In witness whereof I have hereunto set my hand this 31st day of March, 1896.

JOHN RIDDELL.

Witnesses:

B. B. HULL,
GENEVIEVE HAYNES.