No. 814,589. PATENTED MAR. 6, 1906.

K. C. DAVIS.

COMBINED DRILLING AND BOLT CUTTING MACHINE.

APPLICATION FILED MAY 17, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

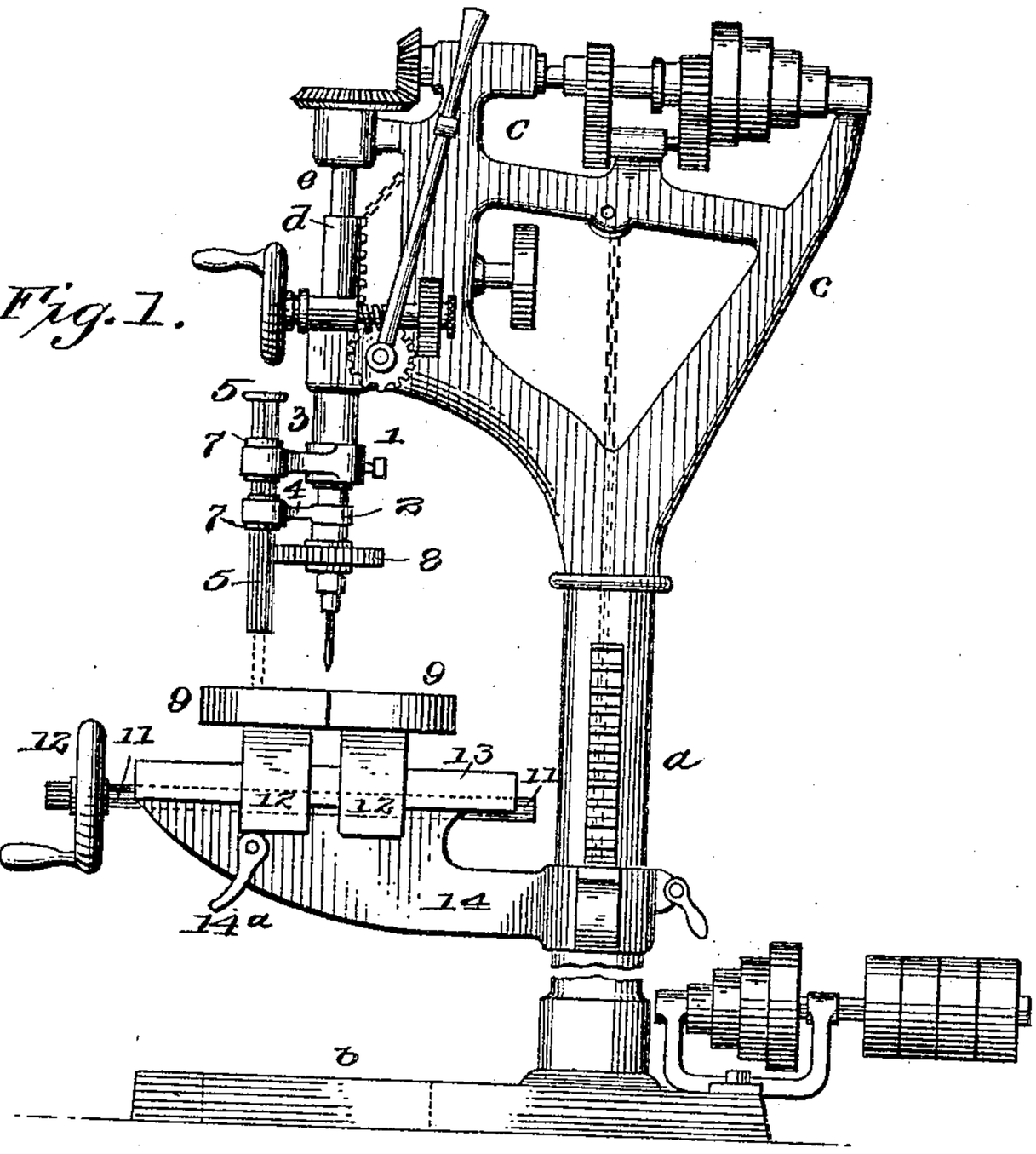


Fig. 2.

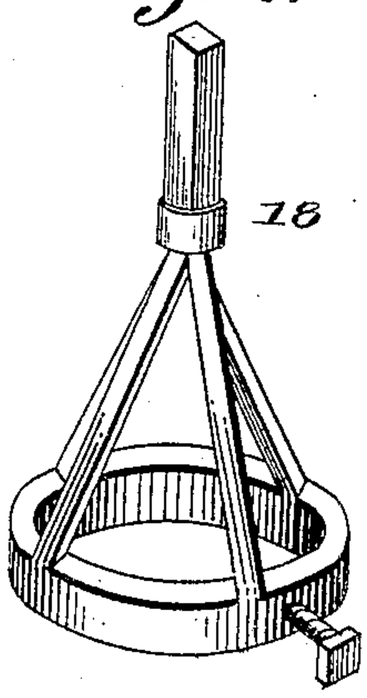
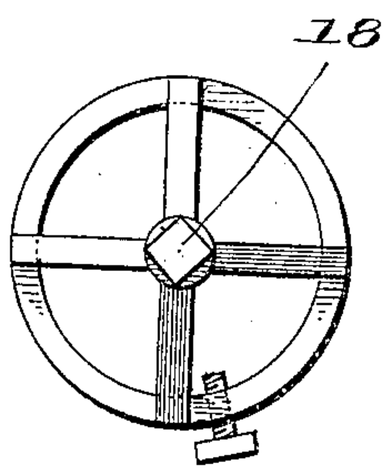


Fig. 3.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 4.

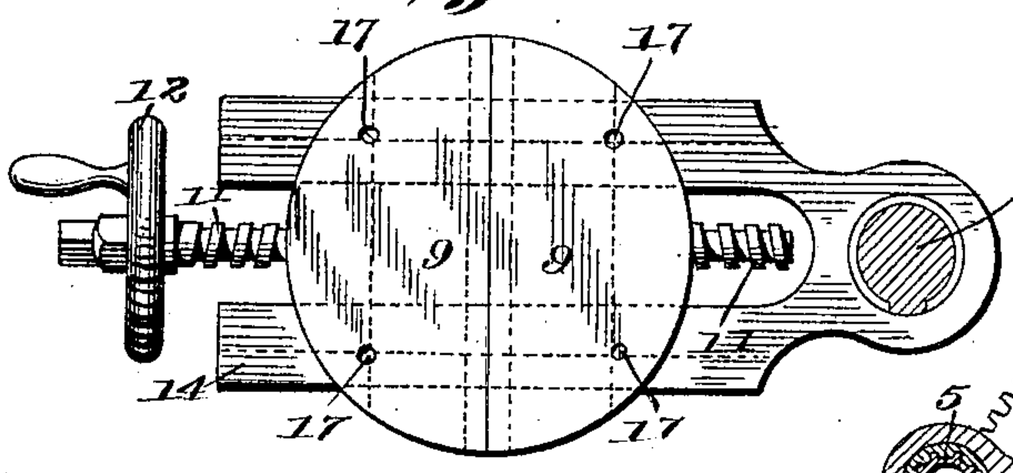


Fig. 5.

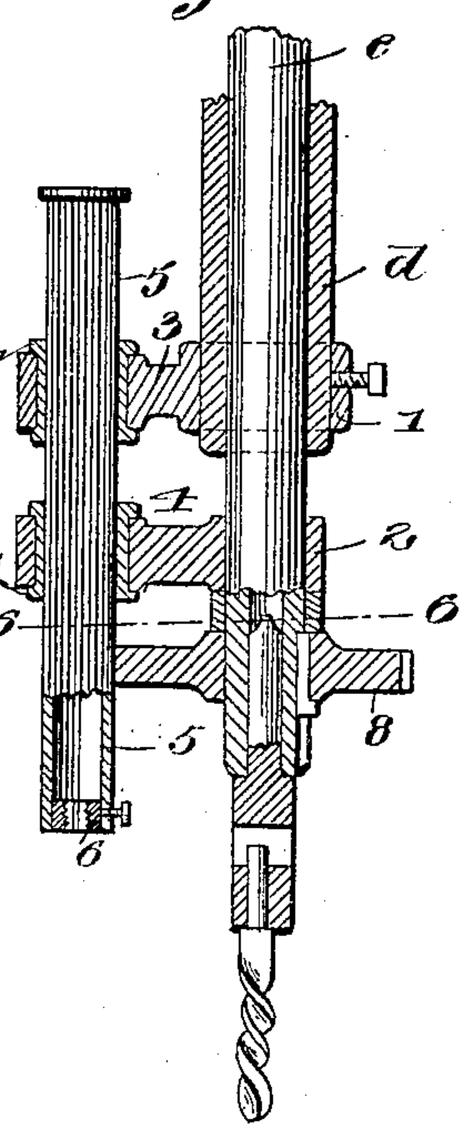


Fig. 6.

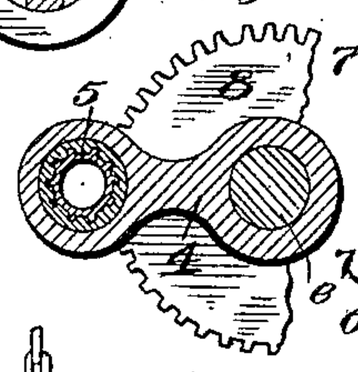


Fig. 7.

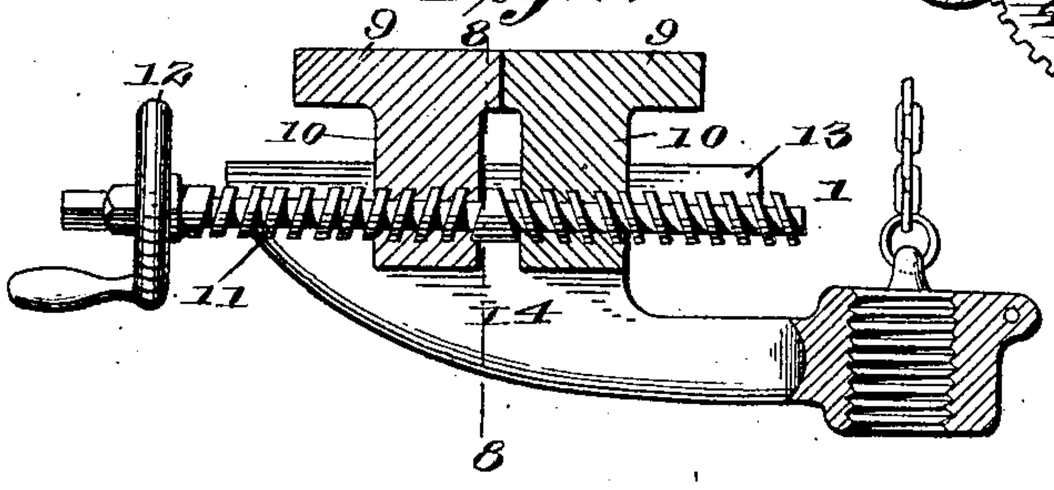


Fig. 8.

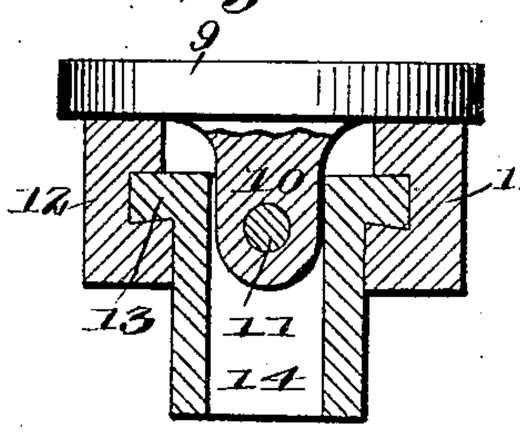


Fig. 9.

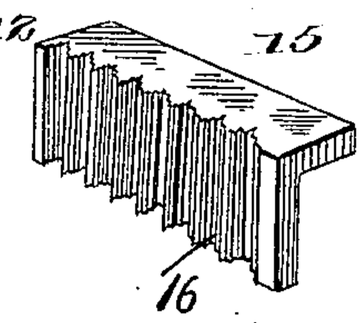
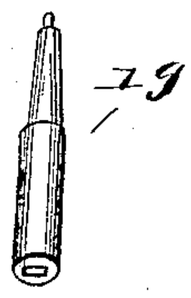


Fig. 10.



WITNESSES:

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KENNETH CASSIOUS DAVIS, OF ELY, NEVADA.

COMBINED DRILLING AND BOLT-CUTTING MACHINE.

No. 814,589. Specification of Letters Patent. Patented March 6, 1906.

Application filed May 17, 1905. Serial No. 260,821.

To all whom it may concern:

Be it known that I, KENNETH CASSIOUS DAVIS, a citizen of the United States, residing at Ely, in the county of White Pine and State of Nevada, have invented an Improved Combined Drilling and Bolt-Cutting Machine, of which the following is a specification.

My invention relates to novel attachments for and changes of construction in vertical drilling-machines, and includes improved means for threading bolts or rods of any desired length.

The details of construction, arrangement, and combination of parts are as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a vertical drilling-machine provided with my improved attachments and changes of construction whereby it is adapted for various kinds of work in a new and improved manner. Fig. 2 is a perspective view. Fig. 3 is a plan view of an improved holder for a threaded cutting-die. Fig. 4 is a horizontal section taken above the face-plate or table. Fig. 5 is mainly a vertical section of a portion of the machine illustrated in Fig. 1, the same showing my bolt-cutting attachment. Fig. 6 is a horizontal section on the line 6 6 of Fig. 5. Fig. 7 is a central vertical longitudinal section of the face-plate or table and the means for adjusting the two parts thereof. Fig. 8 is a vertical section on the line 8 8 of Fig. 7. Fig. 9 is a perspective view of a supplemental jaw or gripping-plate used with the face-plate or table. Fig. 10 is a perspective view of a tool holder or socket for use in connection with the arbor or spindle of a drilling-machine.

Referring in the first instance to Fig. 1, *a* indicates a pillar frame or standard fixed to a horizontal base *b* and having an upper portion *c*, which is branched and otherwise constructed as usual in vertical drilling-machines. The machine is also provided with hand and self-acting feed and cone speed-pulleys in the usual manner.

To the sleeve *d* of the drilling-spindle *e* and to the lower portion of the spindle itself I apply sleeves 1 and 2, (see Fig. 5), which are provided with lateral arms 3 4, that support a tubular die-carrier 5. The same is fluted or grooved throughout its length and is open at each end, the lower end being adapted for attachment of a threaded cutter 6. For the purpose of operation the die-carrier 5 is slidable vertically in flanged sleeves 7, which are held rotatably in the arms 3 4 of the aforesaid sleeves 1 2. A spur-gear 8 is keyed upon the shaft *e* of the drilling-spindle and engages the grooved or toothed die-carrier 5, so that the latter is rotated with the drill-spindle, but obviously at a much more rapid rate.

The die-carrier 5 is slidable vertically in the rotatable sleeves 7, but the gear 8 always remains engaged or in mesh therewith. The die-carrier is adapted to operate upon bolts or rods of any desired length, since the same may extend upward from the face-plate through the die-carrier, which may be placed in any required position around the drill arbor or spindle. Such bolt or rod may be extended downward to any desired length and even pass through an opening in the base or platform 6 of the machine. The feed of the die-carrier 5 is regulated by the thread in the die being used.

The face-plate or table 9 is constructed in halves or two like parts instead of being made solid, as usual heretofore, and each part 9 is provided with a central pendent lug 10, (see Fig. 7,) in which work a right and left feed-screw 11, the same having a hand-operating wheel 12. It is obvious that by rotating said screw the two parts or jaws 9 of the face-plate will be caused to recede from or approach each other correspondingly. As shown in Fig. 8, each jaw is further provided with two pendent lugs 12, which have horizontal dovetailed grooves in their inner sides to receive corresponding guide-ribs 13, forming part of the bracket 14, which constitutes a usual attachment of drilling-machines of this class. As shown in Fig. 1, the said bracket is adapted for vertical adjustment on the pillar frame or standard *a* by the usual means and is also counterbalanced in a well-known manner. It may also swing horizontally on the standard. The face-plate thus constructed is adapted to serve as a vise or gripper or holder for bolts, rods, or other blanks which are to be operated upon either by the die cutter or drill or any other tool that may be held in the rotatable parts above the same. The plate being adjustable toward and from the pillar-frame *a*, the work may be carried right or left, so as to quickly center it under the die-carrier 5 or the drill arbor or spindle, as conditions require. A pivoted cam 14[a] (see Fig. 1) or any other equivalent device may be employed for locking the face-plate in any adjustment on the

bracket 14. I propose to employ a supplemental jaw or gripping-plate 15, (see Fig. 5,) which is constructed in right-angular form and provided on its vertical side with a series of parallel grooves 16, whose sides form an acute angle and are grooved vertically. The grooves and teeth thereof adapt this device for holding bolts, rods, and other blanks with great security.

As shown in Fig. 2, the parts 9 9 of the face-plate may be each provided with two holes 17 for reception of dowels of supplemental jaws or work-holding devices that may be applied on the face-plate for the purpose of gripping and holding large pieces of work which could not be inserted between the jaws themselves of the face-plate. In other words, metal blocks having dowel-pins adapted to enter the sockets 17 (see Fig. 4) may be arranged on the face-plate 9 parallel to each other, there being a considerable space between them when the jaws 9 9 are close together, as shown in Fig. 3. Consequently, when the jaws 9 9 are separated the said blocks are separated to a corresponding width to receive work between them.

In threading very long rods they may be extended down through an opening in the base *b*, and the face-plate will also be adjusted to grip the same and hold them in exact alinement with the tool that is to operate thereon.

In Figs. 2 and 3 I show a form of holder for a die, the same comprising a circular band provided with a clamp-screw and converging arms that connect it with a square shank 18. This shank is in practice adapted to fit into a corresponding socket in the lower end of the drill-spindle or in a detachable socket 19. (Shown in Fig. 10.) By thus constructing a die-holder with a square shank it is held in and adapted to rotate with the socket without requiring to be held by friction, as heretofore.

In further reference to the face-plate I will state that its two parts 9 and their adjusting screw-shaft 11 may be moved together on the bracket 14 toward and from the standard *a*, and hence work may be very quickly centered after it has been clamped, by which a considerable advantage in time and labor is obtained. Also by use of the supplemental detachable jaw-piece 15, Fig. 9, the work may be held firmly with less strain on the screw-shaft 11, since the jaws 9 do not then require to be clamped so tightly. The outer end of the screw-shaft is made four-square to provide for application of a wrench in case it is required.

What I claim is—

1. The combination, with the rotatable arbor or spindle of a drilling-machine, of an attachment consisting of a tubular tool-carrier grooved or toothed throughout its length, and made slidable in its support means for supporting the same and holding it rotatably, and a gear on the arbor meshing with the said tool-carrier, substantially as described.

2. The improved attachment for a vertical drilling-machine comprising sleeves adapted for support upon the drill arbor or spindle of such machine and having lateral arms with alined openings therein, rotatable sleeves held in said arms and provided with grooves interiorly, and a tubular tool-holder which is grooved longitudinally corresponding to the sleeves and adapted for vertical adjustment therein, substantially as described.

3. An improved attachment for a rotatable arbor or spindle consisting of a tubular open-end tool-carrier which is fluted or grooved longitudinally, and a suitable holder for the tool-carrier which is adapted for attachment to the said arbor, said tool-carrier being slidable in said holder, substantially as described.

4. The combination, with the rotatable arbor or spindle having a gear fixed thereon, of sleeves provided with laterally-projecting arms, rotatable sleeves provided with flanges and toothed or grooved interiorly, and held rotatably in the aforesaid arms, and a vertically-adjustable tool-holder which is grooved or toothed longitudinally and adapted to fit and slide vertically in the flanged sleeves and to rotate therewith the same engaging the aforesaid gear, substantially as described.

KENNETH CASSIOUS DAVIS.

Witnesses:
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CLEMET. R. RUSH.