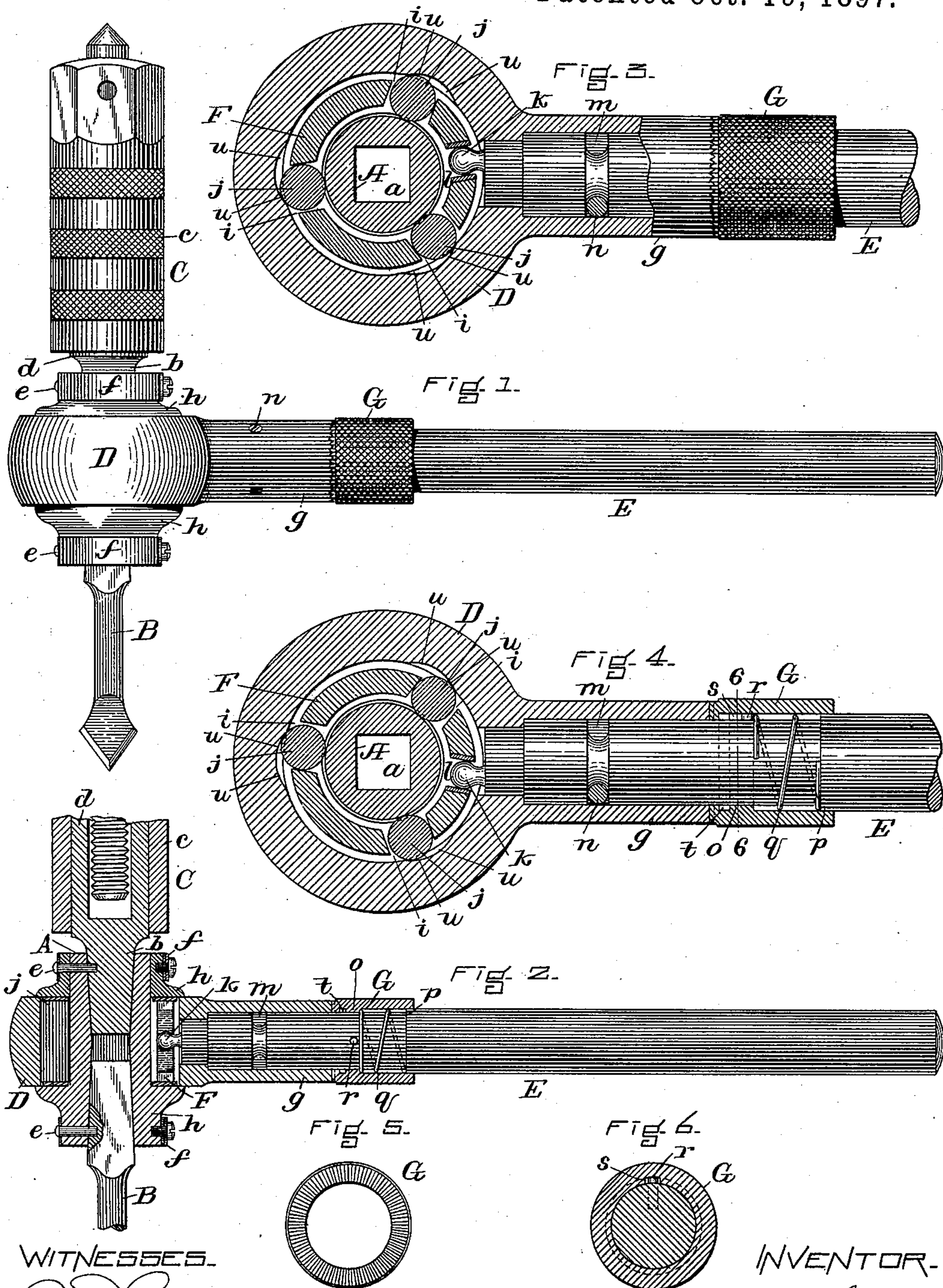


(No Model.)

B. F. SMITH.
HAND DRILLING MACHINE.

No. 592,213.

Patented Oct. 19, 1897.



WITNESSES.

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HAND DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 592,213, dated October 19, 1897.

Application filed December 21, 1896. Serial No. 616,534. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. SMITH, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Hand Drilling-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to drilling-machines operated by hand and by means of friction-rolls, the invention consisting in devices and combinations of devices hereinafter described and specifically set forth in the claims, the object of the invention being to provide for readily changing the mechanism so as to make a "right-hand" or a "left-hand" machine, and to otherwise facilitate manipulation of the machine.

In the drawings, Figure 1 is an elevation of a machine embodying my invention. Fig. 2 is a vertical longitudinal section of the same. Figs. 3 and 4 are sections of certain parts, on the same horizontal plane, but showing different positions of the frictional locking-rolls and devices for changing their position. Fig. 5 is an end view of one element of the clutch, and Fig. 6 a transverse section on the line 6 6 in Fig. 4. Figs. 1 and 2 are drawn on a smaller scale than the remainder of the figures.

The drill-spindle A is provided with a rectangular socket *a* to receive the drill B. The upward part C of the spindle A is preferably joined to the body of the spindle by means of a rectangular part *b*, entering a corresponding socket, as shown. The part C consists of the threaded portions *c* and *d* to move longitudinally one on the other for the purpose of causing the drill to be fed forward in the usual manner. Pins *e* inserted through holes in the body of the spindle and in the shank of the drill and the part C, and held therein by means of springs *f*, form a convenient means for keeping the drill and part C from being accidentally disconnected from the body of the spindle. Surrounding the spindle A is a flange D, having a lateral extension *g*, provided with a socket in which fits to revolve therein a part of the operating-lever E. The flange D is held in longitudinal position on the spindle A by means of

collars *h*, fastened to the spindle, as shown. Within the flange D and between this flange and the spindle is a cylindrical casing F, 55 formed in such a manner as to provide slots *i* to receive the friction-rolls *j* and maintain them in such position that each of them will be parallel to the spindle and will be brought into contact with the spindle and the interior 60 surface of the flange D, as hereinafter specified.

The lever E has on its inner end a knob or projection *k*, eccentrically located on said end and formed to move freely in a slot *l* in the casing F, this slot being parallel to the spindle. 65 The lever E has a circumferential groove *m*, so that a pin *n*, extending through the extension *g* in position to be in said slot, will keep the lever from moving endwise in the extension *g*. On the lever is a collar G, hav- 70 ing an interior shoulder *o*, between which and a shoulder *p* on the spindle is a spiral spring *q*. On the lever is a projection *r*, which enters a longitudinal slot *s* in the interior of the collar G. Thus this collar may be moved endwise on the lever to bring the collar into and out of contact with the end of the extension *g*, the spring acting to force the collar against said end, while the collar 80 will revolve with the lever owing to the projection *r* in the slot *s*. The adjacent ends of the collar G and the extension *g* are grooved radially, as illustrated by Fig. 5, so as to form a clutch to hold the lever in the desired 85 circumferential position with reference to the extension *g*. For convenience there is also a circumferential groove *t* in the interior of the collar G, so that by pressing the collar against the action of the spring and away 90 from the extension *g* and revolving the collar on the lever so as to carry the projection *r* out of the slot *s* into the groove *t* the collar will be held out of contact with the extension *g*. 95

The interior of the flange D is formed so as to present two converging planes *u u* for each roll *j*, which planes are approximately tangential with reference to the cylindrical spindle A. Therefore when each roll *j* is held 100 by the casing F so as to be out of contact with either of the corresponding planes the flange D may be revolved freely on the spindle. When each roll is carried by the casing F, so

as to be pinched between either of said planes and the spindle, then the spindle may be revolved in that direction by means of the lever, and the lever may be swung in the reverse direction without rotating the spindle, according to the well-known action of friction-rolls. Any number of friction-rolls j and slots i therefor in the casing F may be employed in carrying out my invention. I prefer to employ three rolls, as shown.

The operation of the machine will appear from the above description. By pressing the collar G out of clutch with the extension g , as above set forth, and rotating the lever E in the required direction, the casing F will be rotated by means of the projection k , so as to carry the friction-rolls into position to cause the spindle and drill to be revolved by means of the lever as desired, the collar G having been allowed to engage with the end of the extension g to hold the casing F and friction-rolls in said position. It will be noticed that each wall of each slot i performs two offices, one to force the friction-roll out of position to come into contact with one plane u and to carry and hold the roll sufficiently close to the other plane as to be readily caught between the plane and the spindle when the lever is swung in the direction for rotating the drill.

I am well aware that friction-rolls have heretofore been employed in a hand drilling-machine, and, also, that in such machines means have been adapted therein for carrying the rolls from one position to another to be pinched between either of two oppositely-inclined planes for the purpose of operating a drill in either direction. The devices herein described and claimed for carrying out the several purposes of this class of machines are, I believe, not only novel, but very useful with respect to strength, reliability, efficiency, and convenience.

I claim as my invention—

1. In a hand drilling-machine the combination of the drill-spindle, a flange surrounding the spindle provided with oppositely-inclined planes, a casing surrounding the spindle between said flange and spindle and provided with several slots for friction-rolls, rolls in said slots, and devices embodying a

lever revoluble about its axis and at right angles to said spindle for rotating said casing in either direction, substantially as and for the purpose set forth.

2. The combination of a drill-spindle, a flange surrounding the spindle and provided with oppositely-inclined planes on its interior surface and with a lateral extension, a casing having a slot between said spindle and flange, a roll in said slot, a lever having a bearing in said extension to rotate therein, and an eccentric projection on said lever to engage with said casing, substantially as specified.

3. The combination of a drill-spindle, a flange surrounding said spindle and provided with oppositely-inclined planes, a casing between said flange and spindle having a slot, a roll in said slot, a lever to rotate in said flange, or lateral projection thereof, an eccentric projection on said lever to engage with said casing, and a collar on said lever to engage with the lever and with said flange or projection thereon to form an adjustable clutch, substantially as and for the purpose set forth.

4. In combination with a drill-spindle, a flange surrounding the spindle and provided with oppositely-inclined interior planes, and a casing for holding and changing the position of friction-rolls therein, a lever extending laterally into said flange to rotate therein and adapted to engage with said casing, and an adjustable clutch embodying a spring for securing said lever, flange and casing in the required position for operating the drill in either direction, substantially as specified.

5. In a hand drilling-machine operated by means of friction-rolls in either direction as set forth, a casing to receive the friction-rolls, guide the rolls into the required position and maintain them in that position, in combination with a lever for operating the machine, said lever having an eccentric connection with said casing, and adapted to rotate on its axis, for moving said casing to carry the friction-rolls into said position, substantially as specified.

BENJAMIN F. SMITH.

Witnesses:

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EDW. DUMMER.