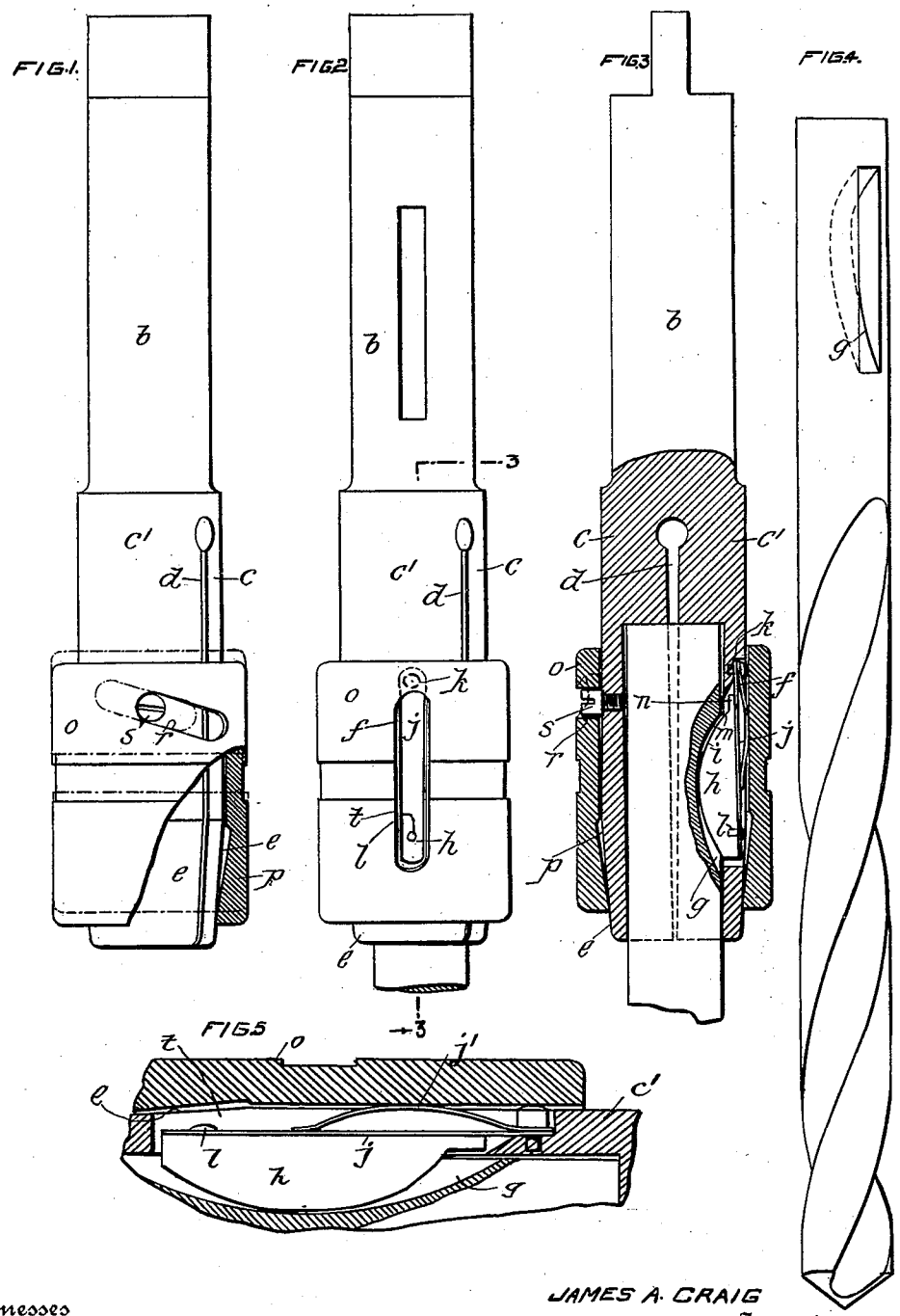
No. 691,449. Patented Jan. 21, 1902.

J. A. CRAIG.

DRILL CHUCK.

(Application filed Aug. 27, 1900.)

(No Model.)



Witnesses

JAMES A. CRAIG

Inventor

By his Attorney

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UNITED STATES PATENT OFFICE.

JAMES ARCHIBALD CRAIG, OF SPRINGFIELD, ILLINOIS, ASSIGNOR TO JOHN LUMSDEN, OF MONTREAL, CANADA.

DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 691,449, dated January 21, 1902.

Application filed August 27, 1900. Serial No. 28,255. (No model.)

To all whom it may concern:

Be it known that I, JAMES ARCHIBALD CRAIG, of the city of Springfield, in the State of Illinois, but temporarily residing in the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Drill-Chucks; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object to provide a drill that will have a chuck from which the bit being driven can be removed when the chuck is rotating at a comparatively slow speed, and, furthermore, that will retain the bit against accidentally falling from the chuck when operatively disconnected therefrom, and, generally speaking, to provide a simple, less costly, and more efficient drill and one that will insure a more perfect locking of the chuck and bit together than has been possible heretofore.

For full comprehension, however, of my invention reference must be had to the accompanying drawings, forming a part of this specification, wherein similar letters of reference indicate the same part, and in which—

Figure 1 is a side elevation, partly in section, of the chuck of a drill constructed according to my invention; Fig. 2, a similar view, but of the opposite side of the chuck and with the bit inserted, but not locked in place. Fig. 3 is a longitudinal sectional view of the chuck and bit, taken on line 3 3, Fig. 2, and with the bit locked in place. Fig. 4 is a view of the bit removed, and Fig. 5 is an enlarged detail view illustrating particularly the latch-actuating springs.

The main part of my improved chuck consists of a shank *b*, formed at one end with a sleeve longitudinally split, as at *d*, to give resiliency to the divided portions *c c'* thereof, the end of this split sleeve being tapered, as at *e*. The portion *c'* is longitudinally slotted, as at *f*, and the shank of the bit slotted, as at *g*, in a position to register with the slot *f* when inserted in the said split sleeve, the inside wall of this slot *g* being concave for a purpose to be presently set forth. A key *h*, having a convex side *i* and a diminished and squared end *n*, is located in the slot *f* and yieldingly held therein by a flat spring *j* and a bow-spring *j'*, secured at one end to the part *c'* of the sleeve within the slot *f* by a headed plug *k*, and the spring *j* being secured at its other end by a rivet *l* to the opposite end of the key, the convexity whereof is bulged out slightly to provide a rounded shoulder *m*. The angles of the bearing-faces of the inner wall of the slot and the upper side of the shoulder are such as to effectively prevent the accidental falling of the bit from the chuck, and the frictional relation between said faces is further augmented by the manner of connecting the flat spring *j* and bow-spring *j'*, owing to the fact that downward pressure by the said concave wall of the slot upon the shoulder will have to overcome the greater resistance of the spring near the point of its connection to the split sleeve, where it is borne upon, under such circumstances, by the straight end *n* of the key. This condition is established when the bit is hanging loose in the split sleeve, and its weight is then overcome by said friction, and it is thereby, as before mentioned, held against falling from place, although a slight pull by the hand will overcome said friction and free the bit.

In order to lock the bit in place, I provide a sleeve *o*, with its lower end diminished, as at *p*, by converging it on a plane corresponding to the taper *e* of the split sleeve over which it takes. This sleeve is slotted diagonally, as at *r*, and a rigid pin, constituted by a screw *s*, carried by the part *c* of the split sleeve, takes into said slot, while said sleeve *o* is longitudinally slotted, as at *t*, to accommodate the key when moved outward against the spring *j* by the withdrawal of the bit from the split sleeve. This sleeve also prevents the accidental displacement of the plug *k*.

The locking of the bit is effected by turning the sleeve *o* toward the left, (looking at Fig. 1,) which will cause the inclined slot to act upon the pin *s* and move the sleeve *o* upwardly upon the split sleeve, thereby through the inclined planes upon the lower ends of the interior of the sleeve *o* and of the split sleeve gripping the split sleeve upon the bit and at the same time turning the slot *t* out of registering position with the key and locking the latter rigidly in the slot in the bit.

It is obvious that with this construction the

bit can be positively locked in the chuck, while as the chucks in practice are invariably driven from the right to the left (looking at Fig. 1) it is only necessary to grip the sleeve *o* and stay it for an instant to effect the unlocking, and the bit can then be removed by a quick downward pull thereupon.

It is further obvious that, if desired, within the spirit of my invention, the slot *f* need not be cut completely through the sleeve *o*, but just sufficient to accommodate the key when it frees itself from the bit-shank—as, for instance, may be sufficient to accommodate other types of keys with less movement.

What I claim is as follows:

1. In a chuck, a sleeve for receiving the shank of the bit, a resilient key carried by said sleeve longitudinally thereof and engaging said bit to retain same against displacement; a sleeve fitting over and movable longitudinally of said first-mentioned sleeve and having a slot longitudinally thereof to accommodate said resilient key in its movement out of engagement with the bit and also having a transverse diagonal slot cut therethrough, said diagonal slot being of a length greater than the width of said longitudinal slot and less than the diameter of the resilient sleeve, a rigid pin carried by the inner sleeve and projecting into said diagonal slot, substantially as described and for the purpose set forth.

2. The combination with a chuck-sleeve longitudinally slotted, and having a resilient key carried by and projecting into said sleeve said key having a rounded shoulder near the end thereof adjacent to its fulcrum, of a bit having a slot with a concave inner wall registering with said key, and means for locking said key against movement when the chuck is driven, substantially as described and for the purpose set forth.

3. In combination with a chuck-sleeve longitudinally slotted; a key *h* carried in said slot and having a convex side *i* with a rounded shoulder *m* near the end thereof adjacent to the point at which it is connected to the sleeve, a flat spring *j* secured at one end to the chuck near one end of said key and at its other end to the opposite end of said key; a sleeve *o* rotatably mounted upon said chuck-sleeve and slotted to accommodate said key in its outward movement and a bit having a slot with concave inner wall to register with said key, substantially as described and for the purpose set forth.

4. A chuck comprising a shank portion having formed in one therewith a slotted resilient sleeve with tapered lower end; a sleeve *o* taking over said resilient sleeve and having the lower end of its interior diminished by converging in a plane corresponding to that of the taper of the end of the resilient sleeve, said latter sleeve being diagonally slotted; a rigid pin carried by said resilient sleeve and taking into said diagonal slot, a key *h* carried in said latter slot and having a convex side *i* with bulging shoulder *m*, a flat spring *j* secured at one end to the resilient sleeve near one end of said key and at its other end to the opposite end of said key; a bow-spring *j'* secured at one end at the point of connection of said flat spring and extending over and bearing upon said flat spring; and a bit having a slot with concave inner wall to register with said key, substantially as described and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

JAMES ARCHIBALD CRAIG.

Witnesses:
FRED J. EVANS,
FRANK H. DENMAN.