No. 815,066. PATENTED MAR. 13, 1906.

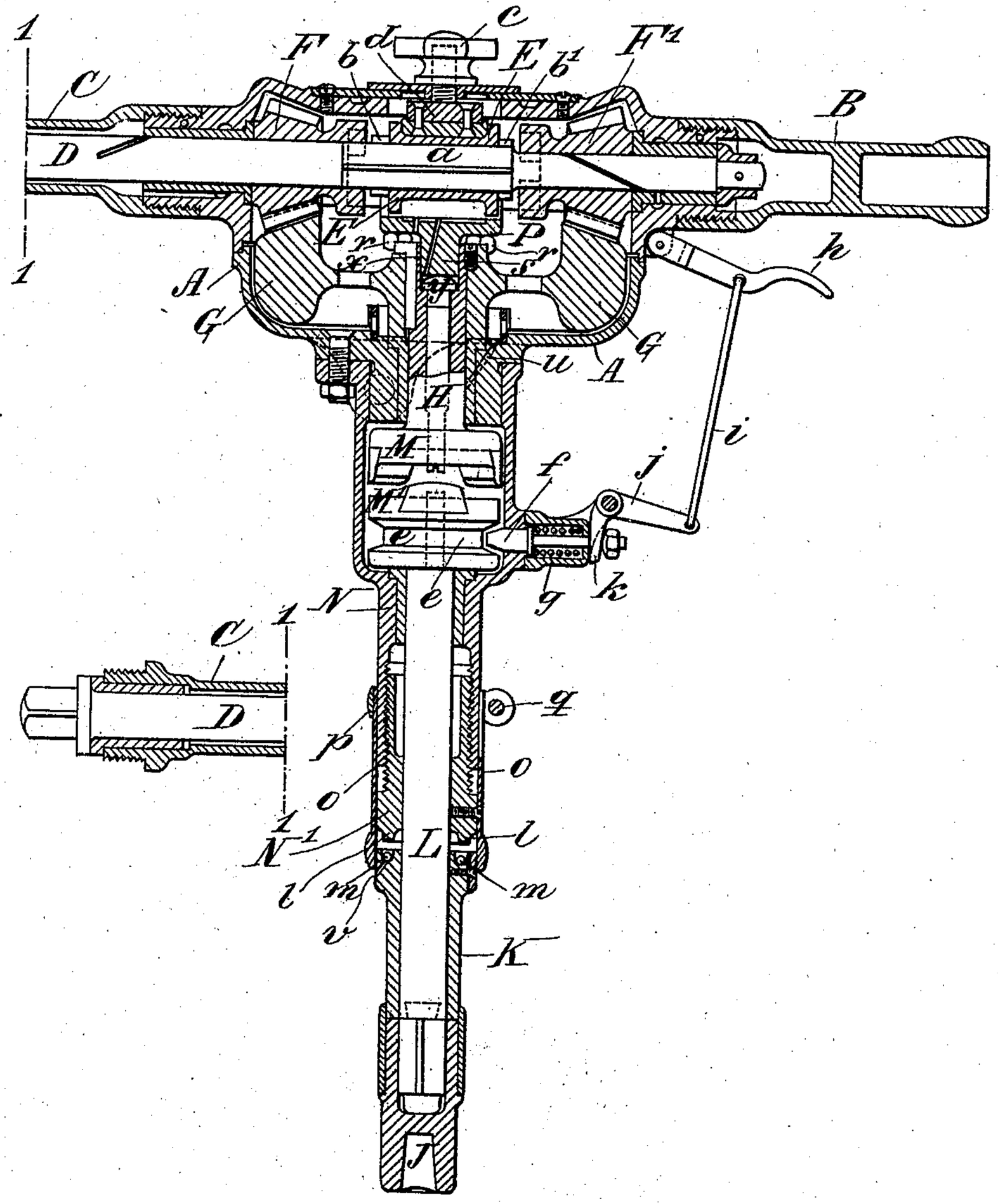
A. COLLET.

PORTABLE APPARATUS FOR TRANSMITTING MOTION TO TOOLS.

APPLICATION FILED MAY 19, 1904.

2 SHEETS—SHEET 1.

Fig. 1.



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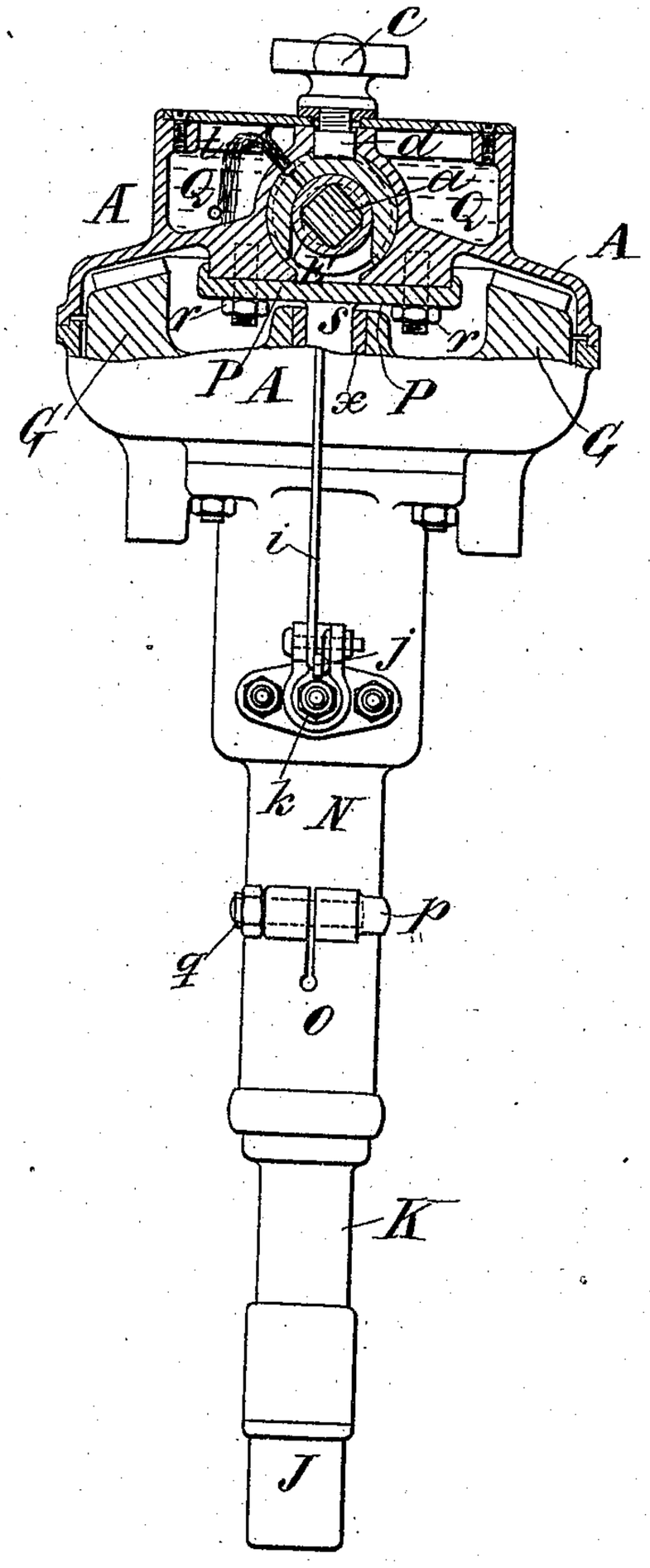
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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PORTABLE APPARATUS FOR TRANSMITTING MOTION TO TOOLS.

No. 815,066. Specification of Letters Patent. Patented March 13, 1906.

Application filed May 19, 1904. Serial No. 208,780.

To all whom it may concern:

Be it known that I, ALBERT COLLET, a citizen of the French Republic, residing in Paris, France, have invented certain new and useful Improvements in Portable Apparatus for Transmitting Motion to Tools, of which the following is a specification.

This invention relates to portable devices for carrying and transmitting rotary motion to tools of various kinds, the power being derived from any convenient source.

The apparatus embodied in the present invention is more especially designed to be used in the open air and to be taken from point to point, so as to operate wherever desired, and in it the tool-stock is disposed with its axis at right angles to the power-transmitting shaft, thus giving to the apparatus a T shape. The apparatus may be employed for boring, driving, and drawing screws and many other uses, the different uses merely requiring that the tool with which it is supplied shall be suited to the work in hand.

One important feature of the invention is that without changing the direction of the driving-shaft the bit or tool may be rotated in either direction as required. Another resides in the facilities for coupling and uncoupling the tool-stock without the necessity of stopping the driving-shaft. Another resides in the means employed for keeping the mechanism free from dust and moisture.

Other details of the invention will be hereinafter described, and the novel features will be carefully defined in the claims.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is an axial section of the apparatus in a plane along the axis of the driving or power-transmitting shaft; and Fig. 2 is an elevation as seen from the right in Fig. 1, the upper part being in axial section transversely of the driving-shaft.

The operative mechanism of the apparatus is inclosed in a metal casing A, having a contour adapted to fit snugly about said mechanism, which is compactly disposed inside. This provision for inclosing the mechanism is essential in an apparatus to be used out of doors and in all kinds of weather in order to protect the mechanism from dust, moisture, and the like. The upper part of the casing has laterally-extending tubular handles B and C, which provide bearings for the driving-shaft D. This shaft may be driven by any suitable motor through known means. On the interior of the casing the shaft D has a square portion *a*, on which is slidably mounted and splined a clutch-sleeve E, provided with teeth *b b'* on its respective ends to engage with teeth on the bosses, respectively, of pinions F and F', which are loose or rotative on the shaft D. The clutch-sleeve E has in it a circumferential groove, which is engaged by a fork *d* between collars *b* and *b'*, and the sleeve is shifted by a milled nut *c*, which screws onto a threaded stem that projects from the fork and plays in a slot in the casing. When the sleeve is made to engage with the clutch-teeth on either pinion, it may be secured against shifting by screwing down the nut *c* until it bears and clamps on the casing A. The pinions F F' gear, respectively, with opposite sides of a relatively heavy wheel G, fixed on an upright shaft H, and said wheel is made heavy in order to serve as a fly-wheel. In the casing is a cross-piece P, which is secured by bolts *r*, as best seen in Fig. 2, and on this piece P is a guiding bearing or stem *s*, which enters a bore or socket *x* in the end of the shaft H. In this socket is a convex bearing-piece *y*, interposed between the shaft and the end of the stem *s*. This bearing-piece reduces the friction and is the stop which limits the endwise movement of the shaft. This shaft H, which receives its motion from the driving-shaft D, in turn imparts motion to a tool-shaft L, alined with the shaft H, through the medium of clutch members M M' on the abutting ends of the respective shafts H and L, the latter having a longitudinal sliding play in the tubular bearing portion N of the casing. To hold the clutch member M' out of engagement, it has in it a circumferential groove *e*, adapted to be engaged by a bolt *f*, backed by a spring *g*, said bolt being mounted slidably in the casing. The bolt *f* may be retracted by a lever *h*, adjacent to the handle *b*, and coupled by a rod *i* to one arm of a bell-crank lever *j*, the other arm *k* of which is forked and engages the stem of the bolt.

J is a socketed tool mounted in a tubular tool-holder K on the lower end of the shaft L and rotatable therewith. The lower portion N' of the part N of the casing is made separate from the upper part, and one screws into the other for the purpose of varying the length, and a split ferrule *o* embraces the parts N N' at their junction. This ferrule is secured to the part N' and has at its upper end a flanged collar or band *p* and a clamp-

ing-screw *q*, by which when the adjustment is effected the parts N and N′ may be secured quite rigidly together. The lower end of the part N′ has formed in it a ball-race *l*, and the upper end of the tool-holder K, which enters the lower end of the ferrule *o*, has also a ball-race containing balls *m*.

The operation of the apparatus will be readily understood. Suppose, for example, it is desired to drive screws having square heads which fit into the square socket of the tool J. The shaft D is coupled by known means to any motor—as by a shaft, for example—and the clutch-sleeve set for driving the tool in the proper direction. When the shaft D is set in motion, the shaft H will be driven, but not the shaft L. The workman grasping the handles B C proceeds to apply the tool J to the head of the screw to be driven. When the tool is set on the screw-head, the downward pressure drives the shaft L upward as far as the play of the bolt *f* in the groove *e* will permit. This movement suffices to allow the ends of the teeth of the clutch members M and M′ to touch and produce friction enough to drive or turn the shaft L slowly and gently until the head of the screw enters the socket in the tool; but the clutch does not under these conditions act as a positive clutch. The workman now with his finger draws up the lever *h* and by this means withdraws the bolt *f*. This permits the clutch members M and M′ to engage positively by the downward movement of the upper member, and it also causes the balls *m* to be clamped between their races. The tool J is now driven positively from the shaft H and the screw is driven in.

Another feature of importance must now be noted. By screwing the part N′ into the part N more or less the extent of engagement of the teeth of the clutch members M and M′ may be thus regulated, and as these teeth are beveled it follows that when the screw is driven home and offers thereby a serious resistance to the rotation of the shaft L the teeth of the clutch members will ride out of engagement by the lifting of the main upper part of the apparatus and allow the bolt *f* to shoot into the groove *e*, thus breaking the positive clutch and avoiding injury to the screw or tool, or both. It will be noted that by this construction the clutch becomes an automatically-disengaging clutch, which will disengage whenever a certain resistance is offered to the rotation of the tool, and the degree of resistance necessary to such disengagement may be regulated by providing through the means before described a greater or less extent of interlocking of the teeth of the clutch members.

As the casing completely houses the mechanism, provision is made for lubricating the latter, and this will now be briefly described. Within the upper part of the casing, Fig. 2, are oil-holders Q, in which dip wicks *t*, that supply oil to the bearings of the shaft D and clutch-sleeve E by capillarity. The oil which descends in the casing flows through a channel *u* along the shaft H to the box inclosing the clutch members M M′, thence down the shaft L to the balls *m*, and thence, if there be any surplus, out at a channel *v*.

By making the wheel G heavy, as indicated in Fig. 1, it serves as a fly-wheel or balance-wheel to steady the movements of the rotating parts.

The manner of using the apparatus and the particular kind of tool J employed will of course vary with circumstances and conditions, and these form no part of the present invention.

The inclosing of the moving parts, except the tool-holder, in a close-fitting casing not only protects the inclosed mechanism and provides a compact portable apparatus, but it protects the workman absolutely from injury by the moving parts.

It may be stated that when the clutch-sleeve E is set at its middle position the shaft D will be wholly disconnected, as both of the clutch members on said sleeve will then be out of gear.

Having thus described my invention, I claim—

1. An apparatus for the purpose specified, having a casing, driving mechanism in said casing, a shaft H in the casing and driven by the above mechanism, said shaft having on its extremity a clutch member M, a shaft L, mounted rotatively and slidably in the casing and alined with the shaft H, said shaft L having on its extremity a clutch member M′ to engage the member M, means for preventing, normally, the interlocking of the teeth of said clutch members, and a tool-holder carried by the shaft L.

2. An apparatus for the purpose specified, having a casing, driving mechanism within said casing, a shaft H rotatively mounted in the casing and driven from the said mechanism, said shaft provided at its lower end with a clutch member M, a shaft L, alined with the shaft H and mounted rotatively and slidably in the casing, said shaft L provided at its upper end with a clutch member M′ to engage the member M for driving, spring-operated means for preventing the interlocking of the teeth of said clutch members, means for limiting the endwise movement of the shaft L, and a tool-holder on the shaft L.

3. An apparatus for the purpose specified, having a casing A, with a tubular pendent part N, a tubular part N′ which screws into the outer end of the part N, a ferrule *o* fixed to the part N′, and embracing the part N, means for clamping said ferrule to the part N, a shaft L, mounted slidably and rotatively in the part N, a tubular tool-holder secured to the shaft L and alined with the part

N′, a ball-bearing between the part N′ and the tool-holder, a shaft H rotatively mounted in the casing and axially alined with the shaft L, said shafts being provided with clutch members for engagement, and mechanism in the casing for driving the shaft H.

4. An apparatus for the purpose specified, having an inclosing casing with handles, driving mechanism within said casing, a tool-holder adapted to be driven by said mechanism and capable of yielding axially, clutch mechanism with beveled teeth connecting the tool-holder for driving, and means for regulating the depth of engagement of said clutch-teeth.

5. An apparatus for the purpose specified, having a casing with a tubular pendent part N, a tubular part N′ which screws onto the outer end of the part N, a ferrule *o* fixed to the part N′ and embracing the part N, means for clamping said ferrule to the part N, a shaft L mounted slidably and rotatively in the part N, a tubular tool-holder secured to the shaft L and alined with the part N′, an antifriction-bearing between the tool-holder and the part N′, a shaft H rotatively mounted in the casing and axially alined with the shaft L, a toothed clutch member M on the shaft H, a corresponding clutch member M′ on the upper end of the shaft L to engage the member M for driving, a spring-operated device which normally prevents the interlocking of the teeth of said clutch members, and manually-operatable means for controlling said spring-operated device.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALBERT COLLET.

Witnesses:

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