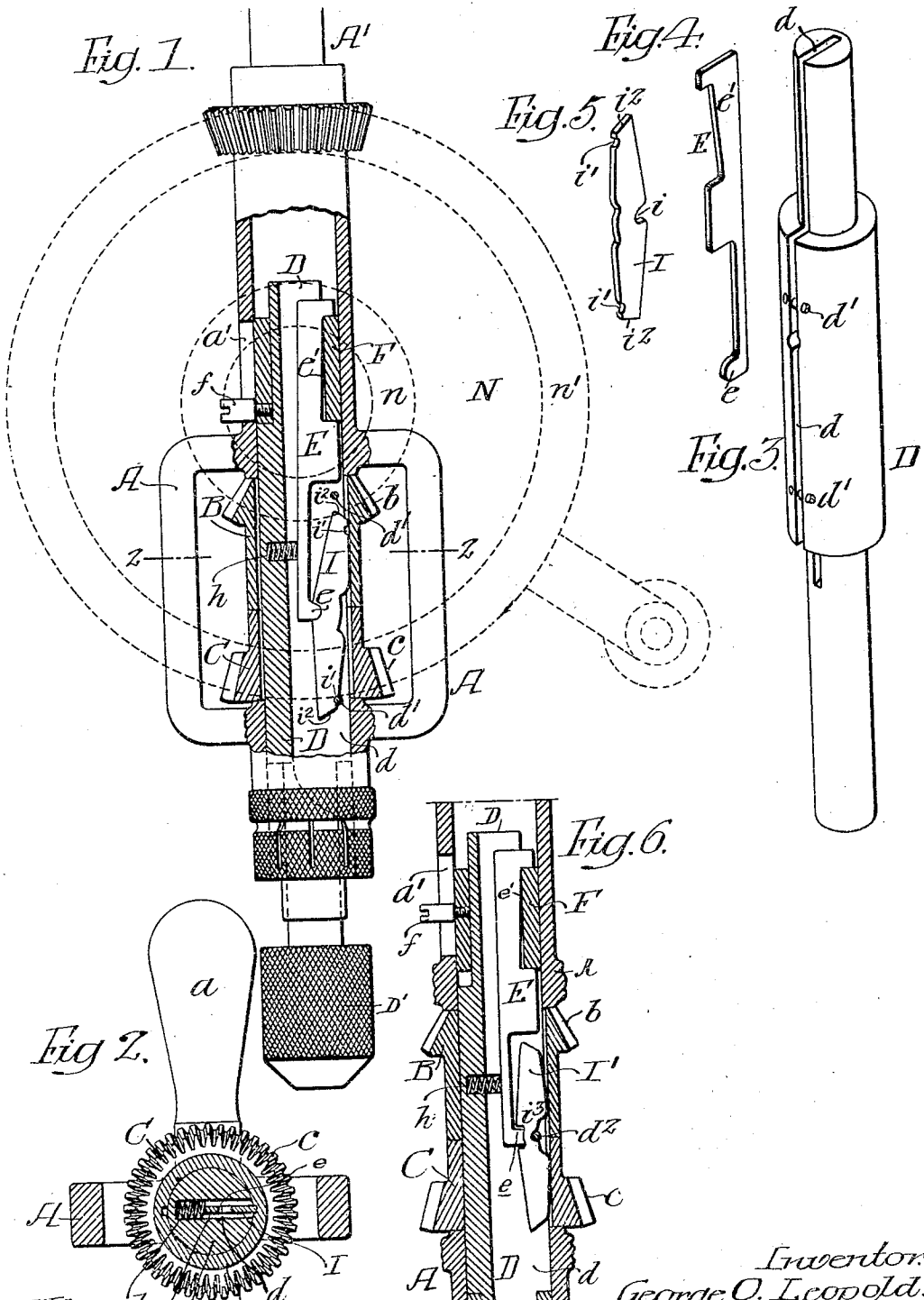


1,236,848.

Patented Aug. 14, 1917.



Witnesses
 E. D. B.
 Walter C. Bism
 Wills & Burrows

Inventor:
 George O. Leopold.
 by his Attorneys:
 Howard & Howard

UNITED STATES PATENT OFFICE.

GEORGE O. LEOPOLD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NORTH BRO'S
M'FG CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CLUTCH MECHANISM.

1,236,848.

Specification of Letters Patent. Patented Aug. 14, 1917.

Application filed March 21, 1912. Serial No. 685,312.

To all whom it may concern:

Be it known that I, GEORGE O. LEOPOLD, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Clutch Mechanism, of which the following is a specification.

My invention relates to certain improvements in clutch mechanism for gearing especially adapted for use in connection with breast drills, or other tools in which a spindle is secured to a driving element.

One object of my invention is to provide means for locking the spindle to either one of the driving wheels, one wheel being driven at one speed and the other wheel being driven at another speed.

A further object of the invention is to construct the clutch mechanism so that it can be shifted to a central position to lock the spindle to both gears in order to prevent the spindle from turning when it is desired to open or close the jaws of the chuck.

My invention also relates to details of construction described hereafter.

In the accompanying drawing:—

Figure 1, is a longitudinal sectional view of a breast drill made in accordance with my invention;

Fig. 2, is a sectional plan view on the line 2—2, Fig. 1;

Fig. 3, is a detached perspective view of the spindle;

Fig. 4, is a perspective view of the shifter;

Fig. 5, is a perspective view of the shifting key which engages the gear wheels by which the spindle is driven; and

Fig. 6 is a view of a modification of my invention.

A is the frame of a breast drill of the ordinary type having an extension A' to which is attached the breast piece, (not shown). D is the spindle mounted in bearings in the frame A. B and C are bevel gear wheels having teeth *b* and *c* respectively, which mesh with the teeth *n* and *n'* on the driving wheel N, shown by dotted lines in Fig. 1, and which is mounted on a spindle projecting from the frame A. This driving wheel has a handle by which it is turned and a handle *a* on the frame by which it is held. The spindle has a longi-

tudinal slot *d* therein, clearly shown in Fig. 3, and extending across this slot are bars *d'*, *d'*.

I is the shifter key, which is pivotally mounted on the projection *e* of a shifter E adapted to move longitudinally in the slot *d*. This shifter is notched at *e'* to engage a sleeve F having a pin *f* which projects through a slot *a'* in the frame A, and on moving this pin longitudinally in the slot the shifter will be moved longitudinally and the key I will be rocked. This key is constructed in the manner shown in Fig. 5, and has a central notch *i* at the back to receive the end *e* of the shifter, and also has a notch *i'* at each end to engage the cross bars *d'* of the spindle. The key is also provided with beveled ends *i*² so that it will slide on the bars *d'* when moved longitudinally.

In the hub of each wheel B and C are slots to receive the key I, preferably two in each hub, and back of the shifter key is a spring *h* which tends to force the key toward the hubs and allows the key to be shifted at any point; the key springing into its slot as soon as it comes in line.

In Fig. 1, of the drawings, it will be noted that one end of the key I lies in the slot of the hub of the gear wheel B, while the other end of the key is clear of the hub of the gear wheel C; the lower bar *d'* resting in the lower notch *i'* of the key I. On turning the driving wheel N, the spindle will be driven through the gear wheels *n* and B. When the shifter is moved in the other direction to the extreme position, the upper beveled end *i*² of the key I will ride upon the upper bar *d'*, and when the key is moved to its full extent, the bar *d'* will rest in the upper notch *i'* of the key I. This movement forces the opposite or lower end of the key into the slot of the gear wheel C, so that on turning the driving wheel N, the spindle will be driven through the gear wheels *n'* and C, while the gear wheel B will turn idly. When it is desired to lock the spindle to the frame, the sleeve F is moved to a central position, and the key I will then engage both gear wheels B and C and, as these gear wheels turn at dif-

ferent speeds, one will lock the other, preventing movement of the spindle. Consequently, the chuck D' on the end of the spindle can be opened or closed by holding the frame of the drill in one hand and turning the shell of the chuck in the other hand.

In Fig. 6, I have shown a modification in which a single cross bar d^2 is used and the key has a single notch i^3 at the center, and the key is beveled on each side of the notch as a modification of the bevel at the end of the key, as in Fig. 5. The same shifter is used. When the key is in the central position, as in Fig. 6, it engages the hubs of both gear wheels, and when in one extreme position it is moved out of engagement with one wheel and moved farther into engagement with the other wheel.

By the above construction it will be seen that I can provide a simple and effective means for locking either one or the other of the gear wheels to the spindle, when it is wished to either drive the spindle at a slow or at a high speed, or the spindle can be locked to both gear wheels by moving the key to the central position, so that the key engages both gear wheels when the chuck on the end of the spindle can be opened or closed.

I claim:

1. The combination in gearing, of a spindle having a longitudinal slot therein; a bearing for the spindle; two hubs mounted on the spindle, each having a longitudinal slot therein arranged to aline with the slot in the spindle; a pivoted key arranged to enter the slot of either hub; a key shifter on which the key is pivotally mounted; and means for causing the key to rock on the shifter as the shifter is moved longitudinally.

2. The combination of a spindle having a longitudinal slot therein; a bearing for the spindle; gear wheels each having a longitudinal slot in its hub; a key mounted in the slot of the spindle, said key having beveled ends; notches adjacent the beveled portions; two bars spaced apart and extending across the slot in the spindle and arranged to be engaged by the key, one of said bars engaging one end of the key and the other bar engaging the other end of the key when the key is moved; means for holding the key in the slot of either hub; and means for moving the key.

3. In clutch mechanism, the combination with a spindle having a longitudinal slot therein and two gear wheels loosely mounted on said spindle and each having a slot therein, of a slidable key mounted in the slot of the spindle; two bars spaced apart and extending across the slot in the spindle, said key being beveled at each end and having

a notch adjacent each beveled portion; means tending to hold the key in the slots of the hubs; and means for shifting the key so as to cause a beveled end thereof to slide on a bar and the latter to enter a notch in the key whereby said key may be held in its adjusted position and in engagement with one of the gear wheels.

4. In clutch mechanism, the combination with a spindle and two gear wheels loosely mounted on said spindle, the hub of each gear wheel having a slot therein and said spindle being slotted, of two bars extending across the slot of the spindle; a key; a shifter for longitudinally moving the key, said key being beveled at each end and notched adjacent each end to engage the bars so that the key may be held in the position to which it is adjusted in engagement with one of the gear wheels; and means tending to force the same into the slots of the gear wheel hubs.

5. In clutch mechanism, the combination with a longitudinally slotted spindle having two cross bars spaced apart, two gear wheels having slotted hubs mounted on the spindle, a frame having bearings on the spindle for holding the gear wheels in position, of a sliding shifter having a projection; a key having a recess at the back to receive the projection, said key being beveled at each end and recessed at each end so that, when it is shifted longitudinally, a beveled portion will ride under a bar until the latter rests in an end recess, one of said bars holding the key in either extreme position; and a spring contacting with the shifter to force the key into engagement with a gear wheel.

6. In clutch mechanism, the combination with a longitudinally slotted spindle and two hubs thereon having internal slots, of a longitudinally shiftable key arranged to engage either one or both of said hubs; a shifter mounted in the slot of the spindle and upon which the key is mounted, said key having beveled ends with notches adjacent said ends; bars carried by the slotted spindle for engagement with the notches of the key; a spring back of the shifter; and means whereby the shifter may be moved longitudinally to cause the key to engage either one or both of the hubs.

7. In clutch mechanism for the gearing of breast drills, the combination with a frame, a longitudinally slotted spindle mounted in the frame and two beveled gear wheels loosely mounted on the spindle and held against longitudinal movement by the frame, each gear wheel having a longitudinal slot therein, of a key mounted in the slot of the spindle and having a recess at the back; a shifter having a projection resting in said recess of the key; a sleeve on the spindle engaging the shifter; a pin carried

by said sleeve for operating the same, the
frame being slotted for the passage of said
pin; two bars spaced apart and extending
across the slot of the spindle, the key being
5 beveled at each end and having a notch ad-
jacent each beveled portion; and a spring
back of said shifter.

In testimony whereof, I have signed my
name to this specification, in the presence of
two subscribing witnesses.

GEORGE O. LEOPOLD.

Witnesses:

WM. E. SHUPE,

WM. A. BARR.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."