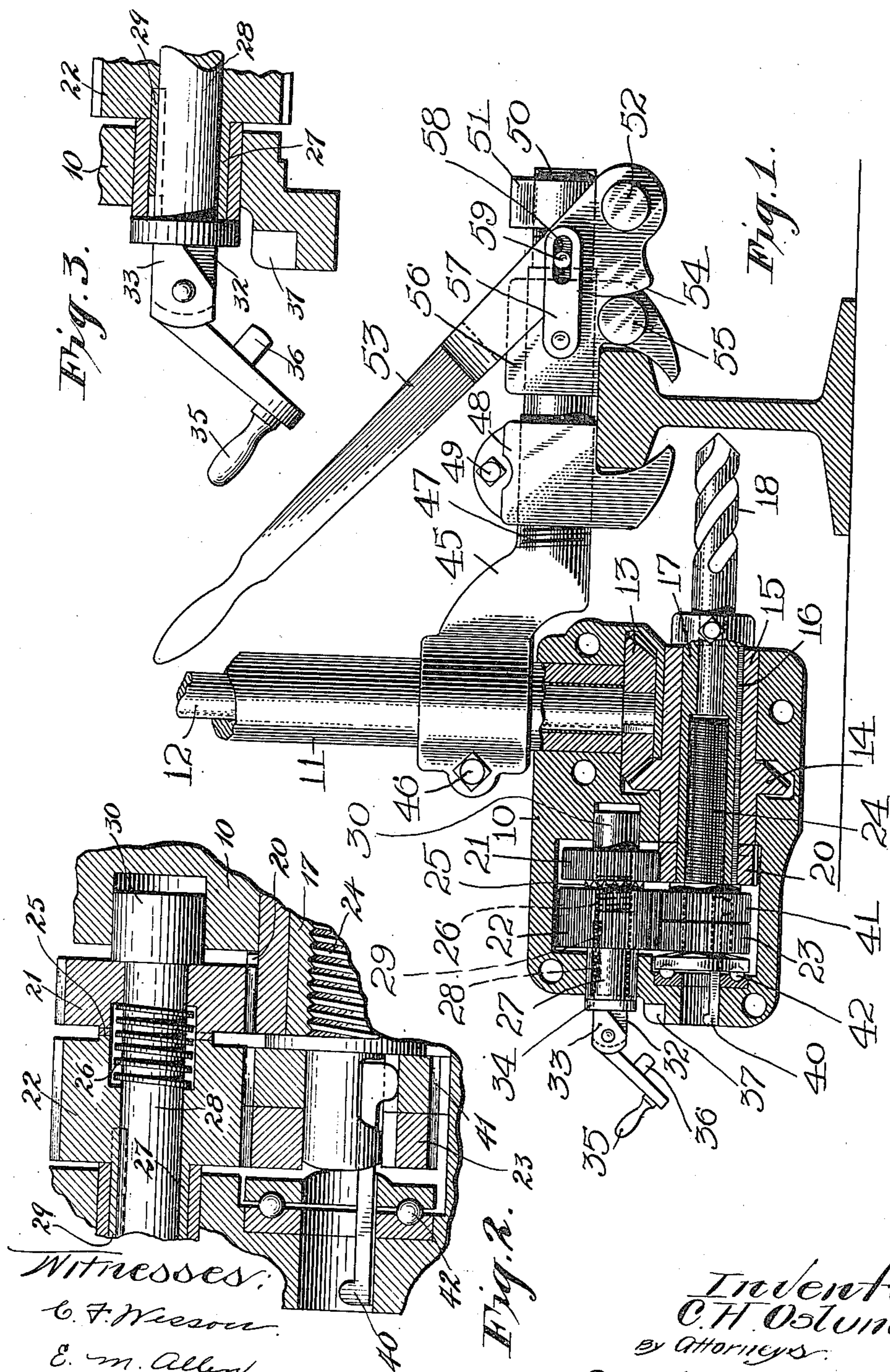


C. H. OSLUND.  
 DRILL.  
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963,317.

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Witnesses:  
 C. F. Mason.  
 E. M. Allen.

Inventor:  
 C. H. Oslund.  
 By Attorneys:  
 Southgate & Southgate.

# UNITED STATES PATENT OFFICE.

CHARLES H. OSLUND, OF WORCESTER, MASSACHUSETTS.

## DRILL.

963,317.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed December 4, 1908. Serial No. 465,969.

*To all whom it may concern:*

Be it known that I, CHARLES H. OSLUND, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Drill, of which the following is a specification.

This invention relates to drills.

The principal objects thereof are to provide a construction in which the driving and feeding mechanism for the drill will be conveniently and compactly located in a small, strong casing; to provide simple and convenient means therein whereby power can be transmitted to the drill either by hand or machinery; to provide means whereby the drill can be fed automatically or by hand independently of its rotation and the change can be made in a very simple and convenient manner; to provide a clutch operating means for disconnecting the automatic feeding device from the rotating means capable of manipulation in a very simple manner; to provide means whereby the clutch operating means can be used independently of the rotating connections, for feeding the drill while it is being rotated by independent means so that the drill can be rotated by power and fed by hand without involving any complicated rearrangement of parts.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawing in which—

Figure 1 is a longitudinal central sectional view of a drill constructed in accordance with this invention, showing a clamp therefor in elevation. Fig. 2 is a similar sectional view on an enlarged scale showing gearing; and Fig. 3 is a similar view showing the parts at the extreme left of Fig. 1.

The drill is shown as comprising an inclosing casing 10 having a sleeve 11 extending therefrom and forming a bearing for a power shaft 12. This shaft can be operated in any of the usual ways by hand or by power and is shown as provided with a bevel gear 13 inside of the casing meshing with a gear 14 on a sleeve 15 for rotating the latter. The sleeve 15 is journaled in a longitudinal cylindrical passage in the casing and is provided with a sliding key connection 16 for a hollow cylindrical, longitudinally movable member 17 for hold-

ing the tool 18. In view of this construction it will be seen that when the shaft 12 is rotated the member 17 and its tool will be rotated also. On the sleeve 15 is fixed a gear 20 meshing with a second gear 21. This gear is adapted to rotate a third gear 22 which meshes with a fourth gear 23. The gears 21 and 22 are inclosed in a cylindrical chamber in the casing parallel and communicating with said passage. The gear 23 is mounted on a shaft 24 having a screw thereon so as to rotate the latter, and this screw which is preferably left-handed engages left-handed screw-threads located on the cylindrical member 17. It will be seen that when the parts are connected up as indicated the rotation of the shaft 12 not only rotates the member 17 and the drill 18, but through the gears 20, 21, 22 and 23 and screw 24 these parts are fed longitudinally.

In order to provide means whereby the feeding connections can be thrown out of operation the gears 21 and 22 are provided with clutch teeth 25, and one of them is provided with a spring 26 for normally forcing the gears and clutch members apart. In the form shown in the drawing, this spring 26 forces the gear 21 to the right, the gear 22 in this case being shown as not movable longitudinally, but as being provided with a hub 27 journaled in the casing. The gear 22 rotates with the shaft 28 being provided with a sliding key 29. The gear 21 freely rotates on the shaft 28 but moves longitudinally with it as said shaft has an enlarged end 30, which engages the gear as the shaft moves to the left. The shaft extends through the hollow hub 27, and is provided with a post 32 on the outer end thereof. On this post is pivoted a cam 33 adapted to engage a collar 34 on the end of the hub 27. By operating a handle 35 which is fixed to the cam this cam can be moved into the position shown in the drawing, in which case the shaft 28 is caused to be pulled to the left taking with it the gear 21 so that the clutch teeth will cooperate and power will be transmitted. If however, the handle 35 is pulled down so that a lug 36 thereon engages in a notch 37 in the casing, the cam will be rendered inoperative and the spring 26 will force the gears apart. In the latter case it will be obvious that there is no feeding motion transmitted to the screw 24 from the shaft 12 when it rotates. The parts are so

proportioned that the lug 36 can be withdrawn from the notch 37 and the handle 35 rotated on the axis of the shaft 28. This causes the gear 22 to rotate independently of the gear 21, and in this case the drill can be fed forward or drawn back independently of the rotation of the shaft 12. If it is desired to gain speed or power between the shaft 12 and the member 17 the number of teeth on the gears 20, 21, 22 and 23 can vary slightly, that is, each one of these gears can have one tooth more or less than the next one.

For the purpose of changing the speed of feed, the screw 24 can be provided with a sliding key 40, and with a fifth gear 41 located at the side of the gear 23. This sliding key is adapted to connect either one of these two gears with the screw, and one of them is provided with one more tooth than the other which can be done, although both of them mesh constantly with the gear 22. This speed changing device however, can be omitted. The screw is shown in the present case as provided with ball-bearings 42 at the end bearing rigidly against the inside of the casing and constituting an end-thrust bearing in the casing.

The sleeve 11 which projects from the casing and which is supported thereby, or by which the casing can be supported, is employed for the connection of the casing with a clamp. For this purpose a bar 45 is secured to the sleeve by means of a bolt 46 or the like. This bar is provided with a screw-thread 47 on which an adjustable clamping jaw 48 is mounted and adapted to be secured by a bolt 49 or the like. On the opposite end this bar is turned down and provided with a screw-thread 50 on which a nut 51 is adjustably mounted. This nut has a pivot 52 for a lever 53 which is provided with a cam surface 54 engaging a projecting bearing surface 55 on a sliding jaw 56. It will be seen that when this lever is brought down the cam surface 54 will exert a powerful force upon it to clamp the work between the two jaws. It will be seen also that the jaw 48 can be adjusted by turning it on its screw-threads, and that the nut 51 also can be adjusted forward and back. When the lever 53 is lifted to bring it back to inoperative position the sliding jaw 56 is brought back with it by means of a link 57 thereon having a slot 58 through which a pin 59 on the lever passes.

The operation of the invention will be ob-

vious from what has been stated concerning the same.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many modifications may be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the features of construction shown, but

What I do claim is:—

1. In a machine of the character described, the combination of a rotatable sleeve, means for rotating said sleeve, a tool-holding device, means whereby the tool-holding device is rotated when the sleeve is rotated, a gear rotatable with the sleeve, a second gear meshing with the first, a shaft, a third gear on said shaft, means for connecting the second gear with the third gear and for disconnecting it therefrom, a fourth gear meshing with the third gear, a screw with which the fourth gear is connected, means on the tool-holding device for engaging the screw, said fourth gear being loose on the screw, a fifth gear on said screw having a different number of teeth than the fourth gear and meshing with the third gear, and a key connecting either the fourth or fifth gear with the screw.

2. In a machine of the character described, the combination of an inclosing casing having a bearing at one end, a tool-holding device, means inclosed in the casing for rotating the tool-holding device, a member rotatable with the tool-holding device, a gear, means whereby the tool-holding device will be rotated by the gear, clutch members inclosed in the casing near said bearing for connecting the gear with the rotatable member, a cam pivotally mounted on the outside of the casing at the end of said bearing for forcing the clutch members together, and a handle located on the cam for operating the cam, said handle being connected with the gear in all positions thereof whereby when the handle is turned to a position to disengage the clutch, the handle can be rotated to rotate the gear and feed the drill-holding member.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

CHARLES H. OSLUND.

Witnesses:

ALBERT E. FAY,  
C. FORREST WESSON.