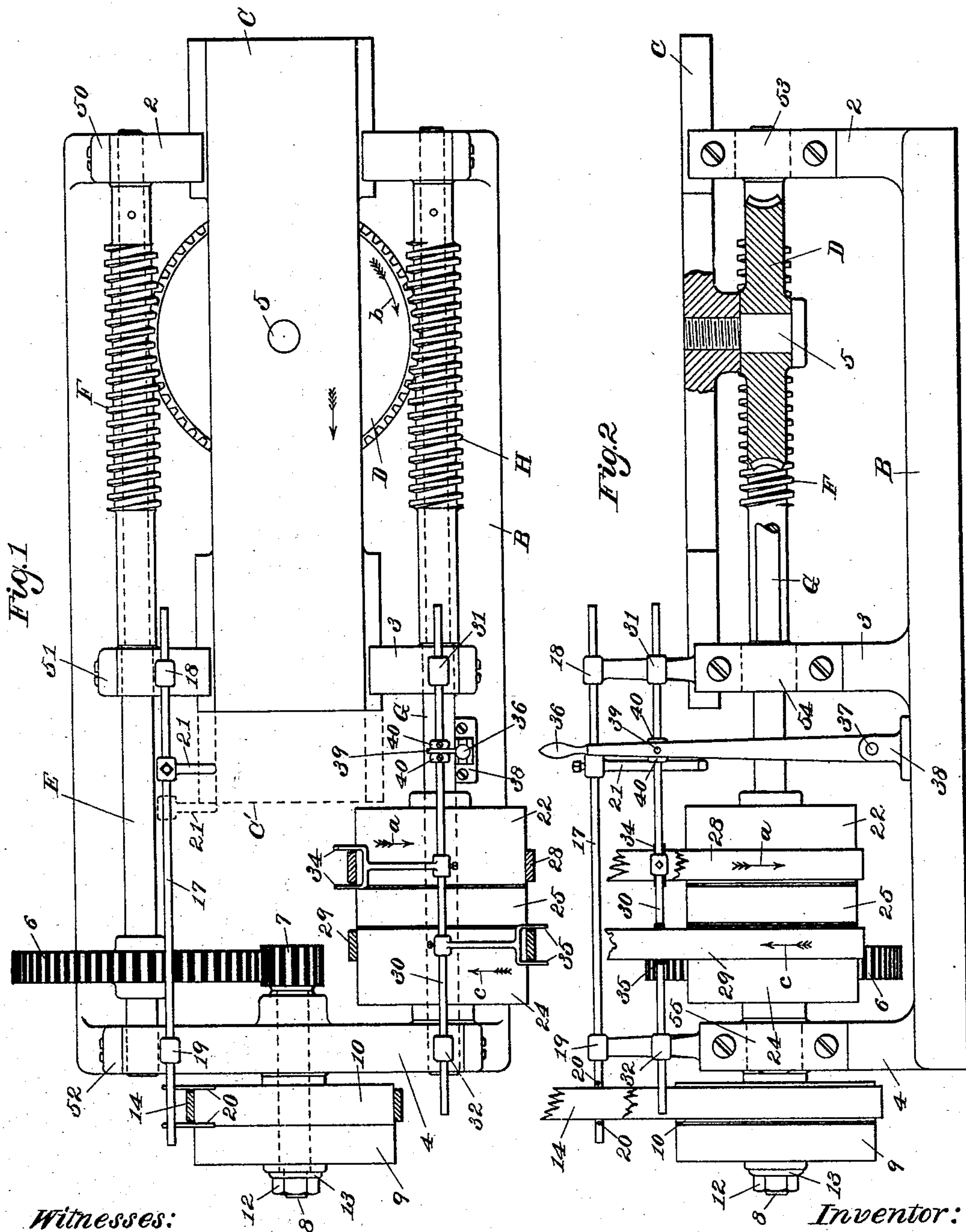


(No Model.)

F. H. RICHARDS.  
DUPLEX FEED MECHANISM.

No. 487,775.

Patented Dec. 13, 1892.



Witnesses:

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# UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO WALTER WOOD, OF SAME PLACE.

## DUPLEX FEED MECHANISM.

SPECIFICATION forming part of Letters Patent No. 487,775, dated December 13, 1892.

Application filed March 25, 1892. Serial No. 426,433. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Duplex Feed Mechanism, of which the following is a specification.

This invention relates to that class of feed mechanisms adapted for imparting longitudinal movements to the slides of machines—as, for instance, the tables of drilling and milling machines—the object being to furnish a “duplex” feed mechanism for imparting to the slide either a slow movement or a (relatively) fast movement, this being accomplished by means of coaxing feed apparatuses arranged for independent operation.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan view of a feed mechanism embodying my present invention. Fig. 2 is a side elevation, partially in section, of the mechanism as seen from the lower side of Fig. 1.

Similar characters designate like parts in both figures.

The framework for carrying the several details and operative parts of the mechanism may be the frame of the machine, to which in any particular instance the feed mechanism may be applied; but in the drawings of this application I have shown a simple framework adapted only for carrying the feed mechanism itself and the slide to be fed thereby. This framework, in the form thereof shown, consists of the base B and the uprights 2, 3, and 4, which uprights are in the nature of cross-walls set on said base-plate B. The slide C, representing the traveling work-holding table or platen of a machine to be actuated, is fitted to slide longitudinally in bearings formed therefor in said uprights 2 and 3. Said slide carries a revolving feed-wheel or worm-wheel D, which is fitted to turn freely on a suitable stud, as 5, that is fixed in the slide. The wheel D meshes on the opposite sides thereof with the two similar feed-screws F and H of the slow-feed and fast-feed apparatuses, respectively. The feed-screw F is carried on the slow-feed shaft E, which is journaled in bearings 50, 51, and

52 in the uprights 2, 3, and 4 of the framework, which shaft has fixed thereto, near the left-hand end thereof, a gear 6, that meshes with a pinion 7 on a stud or shaft 8, journaled in the upright 4 of the framework. As a means for actuating said shaft 8, this is shown provided with a fixed pulley 9 and a loose pulley 10, which are held in place thereon by means of a nut 12 and washer 13. These pulleys are designed to be rotated by means of a suitable belt or band, as 14, applied to the fixed pulley 9.

The slow-feed apparatus is thrown into action and out of action by means of an ordinary belt-shipper arranged for shifting the belt 14 from one to the other of said pulleys 9 and 10. Said shipping device in the simple form thereof herein shown consists of the shipper-rod 17, fitted to slide in suitable bearings, as 18 and 19, on the uprights 3 and 4, and is provided with the belt-engaging fingers 20, one on either side of the belt 14. A stop arm or dog 21 is adjustably fixed to the rod 17 forward of the slide C for shifting the belt from the pulley 10 to the pulley 9 when the slide has moved forward toward the left hand to the position shown by the dotted lines at C', Fig. 1.

The feed-screw H is carried by the quick-feed shaft G, which is similar to the aforesaid shaft E, and is similarly journaled in suitable bearings, as 53, 54, and 55, on the uprights 2, 3, and 4. Said shaft G is provided with two loose pulleys 22 and 24, located between the uprights 3 and 4, and a fixed pulley 25, fixed on said shaft intermediate to the said loose pulleys. The oppositely-running belts 28 and 29 are provided for rotating the shaft G in one or the other direction, as may be required. The belt or band 28 normally runs on the loose pulley 22 and the belt or band 29 on the loose pulley 24. To rotate the shaft G in one or the other direction, one of said belts should be shipped or shifted from its loose pulley onto the fixed pulley 25 in a well-known manner. For thus shifting said belts I have shown a belt-shifting device arranged as follows: a rod 30, which is fitted to slide longitudinally in some suitable bearings, as 31 and 32, on the uprights 3 and 4, respectively. Said rod is provided with some convenient and



suitable belt-engaging arms or fingers, as 34 and 35, for engaging the belts 28 and 29, respectively. A shipper-lever 36 is pivotally supported at 37 on some convenient portion  
 5 of the framework—as, for instance, the bracket 38—and is provided with a projection or arm 39, which engages between the collars 40, fixed on the rod 30. The operator by means of the lever 36 is enabled to slide the  
 10 said rod toward the right or the left, as the case may be, to shift one or the other of the belts 28 or 29 onto the fixed or driving pulley 25 for rotating the shaft G, and through said shaft the worm-wheel D, and thus feed  
 15 the slide C forward or backward, as may be required.

The general operation of my improved feed mechanism is as follows: When it is desired to feed the slide C rapidly toward the left  
 20 hand in the drawings, the operator grasps the lever 36 and throws it over toward the left hand, thereby shifting the belt 28 from the loose pulley 22 onto the fixed pulley 25 and rotating the fixed pulley, shaft G, and screw  
 25 H in the direction of the arrows *a a*. During this operation the screw H acts on the wheel D to revolve the same in the direction of the arrow *b*, Fig. 1, and said wheel, running on the screw F as upon a rack, acts to forward the  
 30 slide. To feed said slide with the fast movement in the opposite direction, the operator has only to reverse the described operation and throw the lever 36 over toward the right hand, thereby shifting the belt 29 from the  
 35 loose pulley 24 onto the driving-pulley 25, and revolving said pulley, shaft, and screw in the direction of the arrows *c c*. This, through the wheel D and the screw F, serving as a rack, feeds the slide C toward the right hand.  
 40 When the screw H is at rest, this screw serves as a rack whereby to actuate the slide through the other screw F, this screw being actuated at a relatively-slow speed by the driving apparatus therefor hereinbefore described. The  
 45 movement of the screw F, when driven by a single belt, as set forth, is of course always in

one direction and is usually at a slow speed, such as required for feeding metal work to cutting-tools. Owing to this circumstance and the organization of the mechanism the operator may at any time during the slow-feed forward movement throw the fast-feed apparatus into action, and thus instantly retract the slide without waiting to first stop the screw F. This feature of the operation is especially  
 55 important in connection with multiple-drilling machines, where the work-table should be quickly retracted on the breaking of a drill; also, in other machines where the work-table has to be run up a considerable distance before starting a cut. 60

Having thus described my invention, I claim—

1. In a feed mechanism, the combination, with the traveling table, of the revolving feed-wheel carried thereby, two feed-screws engaging said feed-wheel, and means for revolving said screws independently of each other, whereby the table may be fed by either one of the feed-screws when the other feed-screw  
 65 is at rest. 70

2. In a feed mechanism, the combination, with the traveling table, of the revolving feed-wheel carried thereby, two feed-screws engaging said feed-wheel, means for revolving one  
 75 of said screws in one direction, and means for revolving the other of said screws in either direction, substantially as described.

3. In a feed mechanism, the combination, with the traveling table, of the revolving feed-wheel carried thereby, two feed-screws engaging said feed-wheel, feed-gearing operating one of said screws, a stop located in the path of the table movement and connected for  
 80 stopping said gearing, and means for revolving the other of said screws independently of said feed-gearing, substantially as described. 85

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