B. M. W. HANSON.

TAIL STOCK FOR METAL WORKING MACHINES.

APPLICATION FILED MAR. 27, 1905.

921,982.

Patented May 18, 1909.

2 SHEETS—SHEET 1.

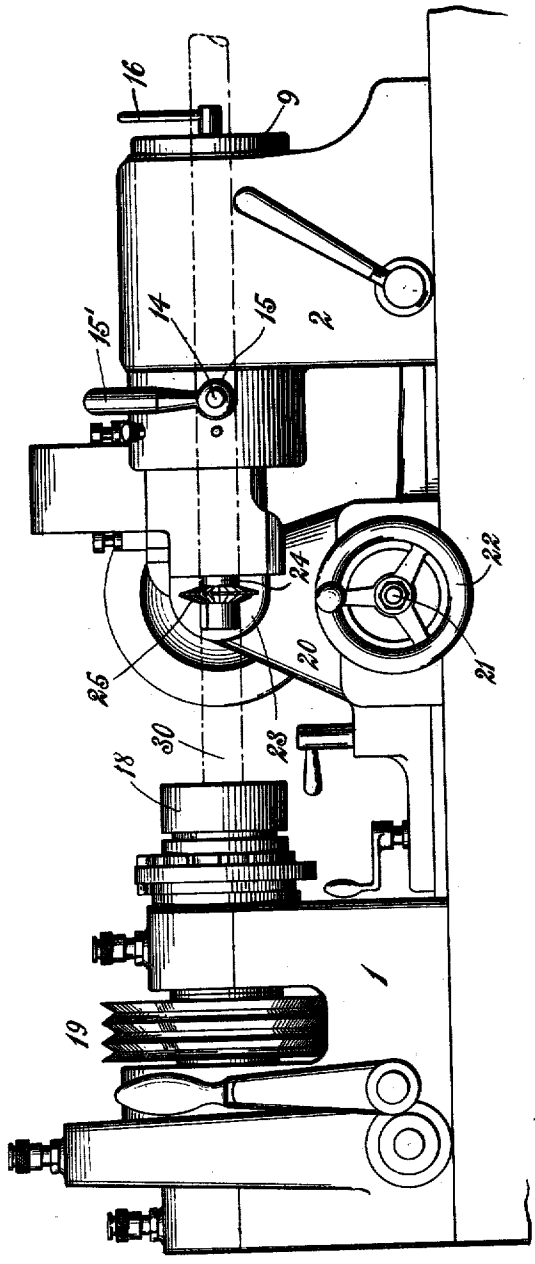


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

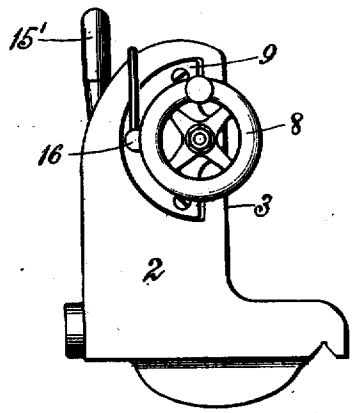


Fig. 3.

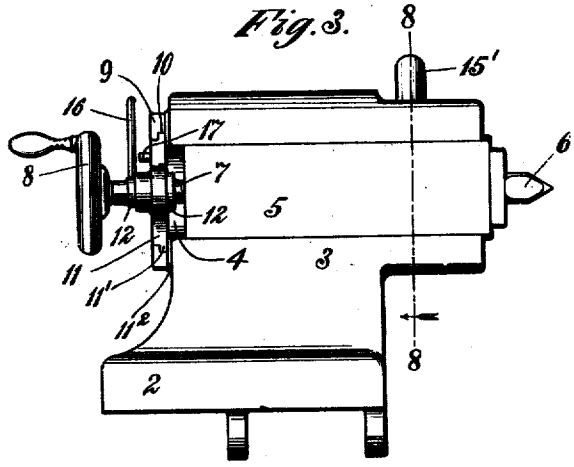


Fig. 4.

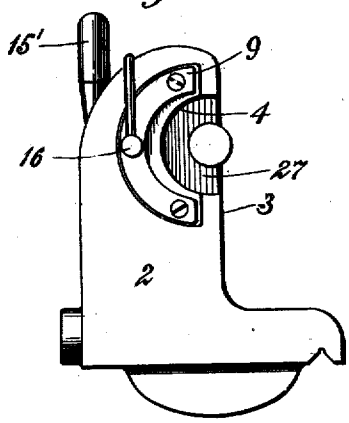


Fig. 5.

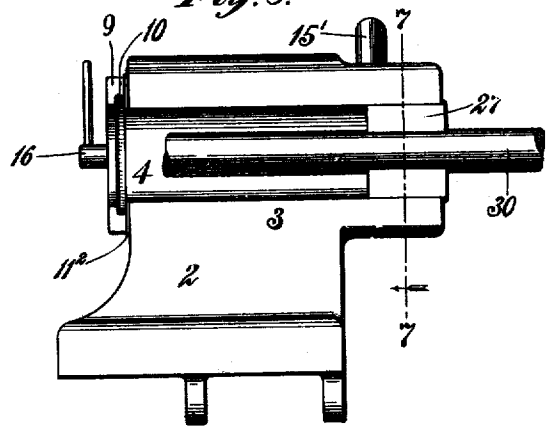


Fig. 6.

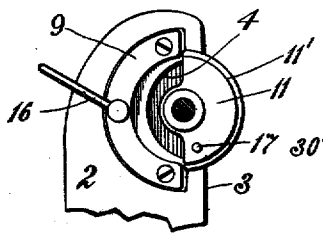


Fig. 7.

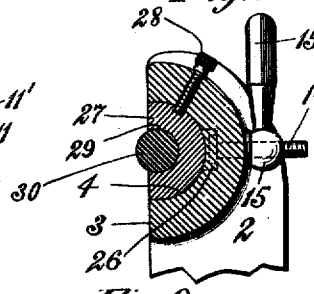


Fig. 8.

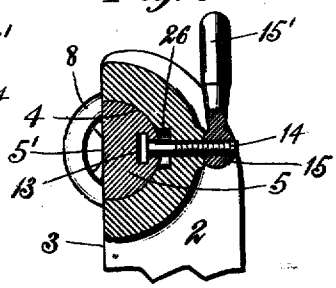
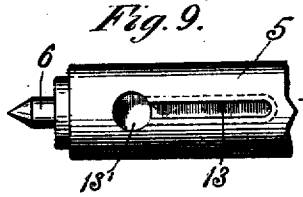


Fig. 9.



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UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

TAIL-STOCK FOR METAL-WORKING MACHINES.

No. 921,982. Specification of Letters Patent. Patented May 18, 1909.

Application filed March 27, 1905. Serial No. 252,336.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tail-Stocks for Metal-Working Machines, of which the following is a specification.

This invention relates to tail-stocks of metal-working machines, more especially to those employed for turning and milling metal, although it is limited to no specific use.

Primarily the object of the invention is the provision of an improved tail-stock, so constructed that the dead-center may be removed and replaced by a bushing or other device for the reception of long work.

A further object of the invention is the provision of a tail-stock, a dead-center carried by said tail-stock, and means for detachably securing the center in place, so that it may be removed and a bushing substituted therefor when desired.

A further object of the invention is the provision of means for securing the dead-center in place in the tail-stock, said means including a plate carried by an element of the center, and said plate being capable of being swung in and out of connection with a complemental plate which locks it in place.

Further objects of the invention will be set forth in the following detailed description.

In the accompanying drawings, Figure 1 is a side elevation of a metal-working machine, shown as a machine for milling spirals, to which my invention may be applied. Fig. 2 is an end view of a tail-stock embodying my invention, and Fig. 3 is a side view thereof. Fig. 4 is an end view of the tail-stock, showing the center and its carrier removed, and a bushing inserted in the body of the stock, and supporting the work, and Fig. 5 is a side view thereof. Fig. 6 is a partial end view of the tail-stock, showing the swinging plate carried by the screw thereof. Fig. 7 is a transverse, vertical section on line 7—7 of Fig. 5, looking in the direction of the arrow; Fig. 8 is a transverse vertical section on line 8—8 of Fig. 3 looking in the direction of the arrow; and Fig. 9 is a detail view of the center-carrier.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates a head-stock of common construction, and the numeral 2 a tail-stock in which my invention is embodied. This tail-stock is of peculiar form, and is constructed with a flat side 3. In said side is formed a curved groove 4 for the reception of a slide 5, having a flat side 5′ by which the dead-center 6 is carried. Threaded into the slide is a screw 7, shown in Fig. 3,—said screw being equipped with a hand-wheel 8 by which it is manipulated.

Rigid with the end of the tail-stock is a curved plate 9, rabbeted at 10 to receive the flange of a cut-away plate 11, loosely mounted between collars 12 of the barrel of screw 7,—said plate 11 having a rabbet 11′ to conform to the similar configuration of the plate 9, as illustrated in Fig. 3.

As shown in Figs. 3 and 8 the body of the slide 5 carrying the dead-center 6 is flattened on one side and curved on the other to fit the recess in the upper part of the tail-stock,—the flat surface of the slide being flush with the like surface of said tail-stock. In the curved side of the slide is formed a longitudinal T-shaped groove 13 open at one end to receive the head and shank of a screw 14,—the latter carrying a nut 15 having a manipulating-handle 15′, and serving to bind the slide 5 rigidly in position after it has been adjusted by the screw 7. When the slide 5 is in place in the passage of the tail-stock, as shown in Fig. 3, it is locked in such position by turning the curved plate 11 from the point shown in Fig. 6 to that illustrated in said Fig. 3, and a lever-screw 16 is then tightened to clamp the parts rigidly in place. To aid in turning the plate it may be provided with a pin 17 on its outer surface by which it may be readily manipulated. When long stock is being worked it is necessary to support the end thereof to prevent springing as the rod or bar is fed through the chuck 18 of the machine. This chuck is carried by a hollow spindle driven in any desired manner, as, for instance, by a pulley 19.

In the embodiment of the invention illustrated a cross-slide 20 is represented, said slide being actuated by the usual screw 21 and hand-wheel 22. On said slide is mounted a carrier 23 fitted for swinging adjustment, and in this carrier is journaled a rotary shaft 24 carrying a milling-cutter 25 for operation upon the stock.

It is frequently necessary to thread work

of greater length than can be received between the dead-center and the chuck of the machine, and to enable this to be accomplished in the present construction the slide 5 and its center must be removed and replaced by suitable means for supporting the stock. This requirement also exists in surface-finishing, in turning, milling, and in grinding, when it is necessary to produce long stock every part of which will be of the same precisionized diameter. In the present construction to remove the slide 5 and dead-center, the screw 16 is released, and plate 11 is turned from the position illustrated in Fig. 3 to that shown in Fig. 6, when all of the parts may be withdrawn. To enable this readily to be accomplished the head of bolt 14 passes freely out of the opening 13′ in the T-slot in the slide 5, and the bolt is then withdrawn until its head enters a recess 26 formed in the tail-stock for its reception, said recess being illustrated in Fig. 8, the nut 14 being then tightened to retain the bolt in its withdrawn position, as illustrated by dotted lines in Fig. 7. When the tail-stock is thus cleared of the slide 5 and its attached parts, a bushing 27 is inserted in the passage of the tail-stock, and is clamped in place by a screw 28, said bushing having a groove 29 for the reception of the stock 30, and overlapping said stock for about two thirds of its periphery, as shown in Fig. 7, so that lateral escape of the stock is prevented. A series of interchangeable bushings is provided, each with a groove of different diameter, and each of the same shape so that stock of any desired size within the capacity of the machine may be supported.

In the operation of the invention, when stock of a length to be received between the center 6 and the chuck 17 is to be worked the slide 5 carrying the dead-center 6 is in place, and the stock is advanced through the chuck and hollow spindle until its end engages, and is supported by said dead-center, after which the tool carried by the slide-rest is adjusted to operate upon the stock. Should it be desired to thread, or otherwise work, long stock, for instance, in manufacturing screws of considerable length, after the tool-slide has advanced as far as possible, the slide 5 carrying the dead-center is released by withdrawing the bolt 14, until its head enters the recess 26, and turning the plate 11 from the position shown in Fig. 3 to that represented in Fig. 6, and said slide is then withdrawn from its passage in the stock. To enable this withdrawal the lever-screw 16 is first loosened, thereby releasing the plate 9 which was forced by the head of said screw against the plate 11, to lock said plate against bearing-surfaces 11^2 of the tail-stock. To enable the head of bolt 14 to be withdrawn from groove 13 in slide 5, said slide is advanced until the head of bolt 14 enters the opening 13′, when it may readily be retracted by turning the lever-nut 15, and locked against movement in the recess 26 (see dotted lines Fig. 7). After the slide has been withdrawn a bushing 27 having a groove suited to the diameter of the stock undergoing operation is inserted in the groove 4 of the tail-stock, as illustrated in Fig. 5, and is secured in place by the screw 28—Fig. 7, said bushing serving to support the stock, and prevent it from distortion while undergoing the remainder of the operation, as illustrated in Figs. 5 and 7. As will be observed this bushing has a flat side which lies flush with the flat surface of the tail-stock when the bushing is in place, in virtue of which construction the tool may be traversed over that portion of the stock supported by said bushing, thereby permitting a longer piece of work to be produced than can be made with ordinary machines.

Changes may be made in the details of the invention, which is not limited to the exact devices shown and described. Nor is it limited to the shape of the slide and recess therefor in the tail-stock, for various configurations of said parts and also of the interchangeable bushings may be made if desired.

Having thus described my invention, what I claim is—

1. The combination, with a tail-stock having a passage, and a recess in the wall of said passage, of a slide fitted in the passage, and having a longitudinal groove, and a bolt, the head of which is fitted in said longitudinal groove, said bolt serving to lock and release the slide, and its head fitting in the recess of the passage when the slide is withdrawn to permit the entrance of work, and of a bushing for supporting said work.

2. The combination, with a tail-stock provided with a longitudinal passage, of a slide fitted in said passage; a screw for actuating the slide; a center carried by the slide; a plate loosely mounted on the screw; and a locking-device interlocking with the plate, and carried by the stock.

3. The combination, with a tail-stock having a longitudinal passage, of a slide shaped to fit said passage; a center carried by the slide; a screw for actuating the slide; a rabbeted plate rotatable on the screw; and a rabbeted device on the stock with which said plate interlocks.

4. The combination, with a tail-stock having a longitudinal passage, of a slide fitted to said passage; a center carried by the slide; a screw for actuating the slide; a curved and rabbeted plate sleeved and rotatable on the screw; and a curved and rabbeted plate secured to the stock, and with which the plate sleeved on the screw interlocks.

5. The combination, with a tail-stock having a longitudinal passage, of a slide shaped

to conform to said passage; a center carried by the slide; means for actuating the slide; a locking-device carried by and adapted to swing on said means; and means on the stock interlocking with said locking-device.

6. The combination, with a tail-stock having a passage, of a slide; a screw for locking said slide; a screw for actuating said slide when released; a plate loose on the screw for actuating the slide; and means on the tail-stock adapted to interlock with said plate, when swung on the screw.

7. The combination, with a tail-stock, of a slide; a screw provided with collars; a cut-away plate rabbeted at its edge, and sleeved on the screw between the collars; a plate also rabbeted at its edge, and secured to the tail-stock; and means for clamping said plate on the tail-stock against the plate on the screw.

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

BENGT M. W. HANSON.

Witnesses:

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F. E. ANDERSON.