(No Model.)

H. E. MURDOCK.

CANNON PINION FOR WATCHES.

No. 389,663. Patented Sept. 18, 1888.

Fig. 1.

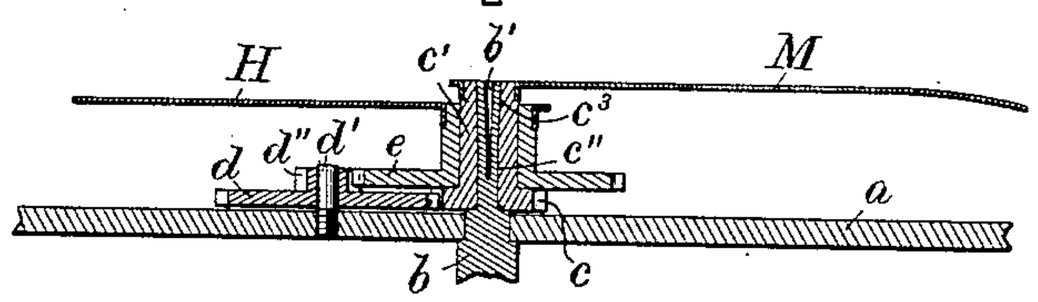


Fig. 2.

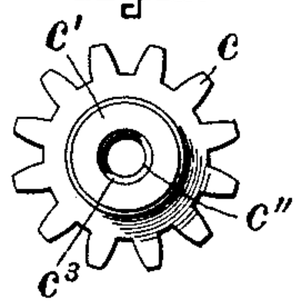


Fig. 4.

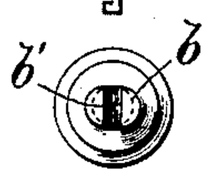


Fig. 6.

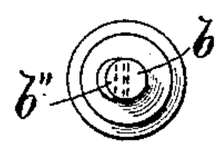


Fig. 8.

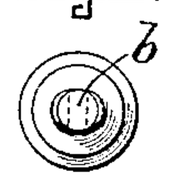


Fig. 3.

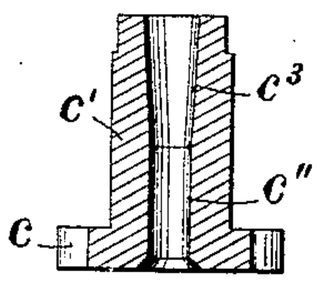


Fig. 5.

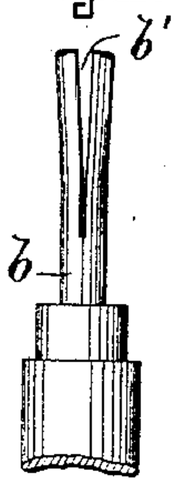


Fig. 7.

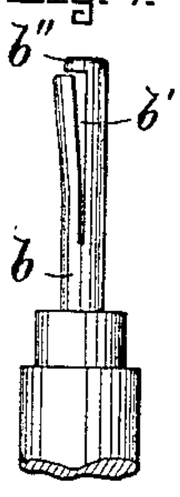
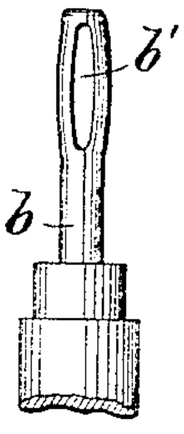


Fig 9



Witnesses

Henry Chadbourn.

Helene Lunggovist

Inventor

Herman E. Murdock.

by A. Van Andrén.

his attys.

UNITED STATES PATENT OFFICE.

HERMAN E. MURDOCK, OF WALTHAM, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO SAMUEL A. CHRISTIE, OF SAME PLACE.

CANNON-PINION FOR WATCHES.

SPECIFICATION forming part of Letters Patent No. 389,663, dated September 18, 1888.

Application filed June 22, 1888. Serial No. 277,863. (No model.)

To all whom it may concern:

Be it known that I, HERMAN E. MURDOCK, a citizen of the United States, and a resident of Waltham, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Cannon-Pinions for Watch-Movements, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in cannon-pinions for watch-movements; and it has for its object to secure the center-staff in such movements by frictional means to the cannon-pinion in such a manner that a positive motion will be imparted from the center-staff to the cannon-pinion and the minute and hour hands by the improved friction locking device, and it also permits of the setting of the hands independent of the motion of the center-staff, as will hereinafter be more fully shown and described, reference being had to the accompanying drawings, where—

Figure 1 represents a central longitudinal section of the cannon-pinion and center-staff and connections to the hour and minute hands. Fig. 2 represents a plan view of the cannon-pinion, and Fig. 3 represents a central longitudinal section of the same. Fig. 4 represents an end view of the expansive center-staff, and Fig. 5 represents a side elevation of the same. Figs. 6 and 8 and Figs. 7 and 9 represent, respectively, plan views and side elevations of modifications of the expansive center-staff.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a in Fig. 1 represents the pillar-plate of a watch-movement in which is journaled the center-staff *b*.

c is the cannon-pinion, and *c'* is its annular hub, to the upper end of which is secured the minute-hand M, as shown in Fig. 1.

d is the minute-wheel, journaled on the stud or pin *d'* on the plate *a*, which wheel meshes in the teeth of the cannon-pinion *c*, as usual in watch-movements.

d'' is the minute-wheel pinion, concentrically secured to the minute-wheel *d*, and having its teeth meshing in the teeth of the hour-wheel *e*, that is journaled on and surrounds the hub of the cannon-pinion *c*, as is common in watch-movements.

H is the hour-hand, secured to the upper end of the hub of the hour-wheel *e*, as shown in Fig. 1.

The manner of gearing above mentioned forms no part of my present invention, and is only shown and described so as to more clearly elucidate the nature, use, and object of my improved manner for frictionally securing the cannon-pinion and center-staff together, which is done as follows: The upper end of the center-staff *b* is slitted longitudinally, as shown at *b'* in Figs. 1, 4, and 5 and the slitted portions expanded laterally, hardened, and tempered, so as to serve as friction holding devices when introduced in the centrally-perforated hub of the cannon-pinion, as shown in Fig. 1.

The lower portion, *c''*, of the central bore in the cannon-pinion *c* is preferably made cylindrical, so as to fit the solid part af the center-staff, and the upper portion, *c³*, of such bore is preferably made enlarged or tapering, as shown in Figs. 1, 2, and 3, so as to allow the upper slitted ends of the center-staff to expand against the inside of such enlarged or tapering portion of the bore when the cannon-pinion is put in place on said slitted center-staff, and by this means the cannon-pinion is prevented from working upward on said center-staff during the setting of the hands of the watch mechanism. By this construction of a longitudinally-slitted center-staff the cannon-pinion is frictionally secured to it, so as to move with said center-staff when the time mechanism is running, and the hands may be set without interfering with the motion of the center-staff, whenever so desired.

Thus my improved device for frictionally connecting the cannon-pinion and center-staff is very simple, positive in its action, and can be made at less cost as compared with other devices for this purpose.

Should it be desired in watches or time-pieces to have the upper end of the center-staff show solid, this may be accomplished by either one of the modifications shown in Figs. 6, 7 or Figs. 8, 9.

In Figs. 6 and 7 the center-staff is slitted, as in Fig. 5; but one of the upper end portions of the slitted center-staff has a lip, *b''*, that laps over the other part of the slitted center-staff, thus having all the advantages of the device shown in Fig. 5, with the additional one of appearing non-slitted or solid at the end. The same result is obtained in the modification shown in Figs. 8 and 9, in which the slit in the center-staff is not carried entirely to the upper end, but terminates a short distance from it, the sides at the slotted portion being expanded, so as to serve as friction holding-springs against the interior of the bored-out cannon-pinion in the same manner as above shown and described.

What I wish to secure by Letters Patent and claim is—

1. In a watch-movement, the center-staff, as described, having the slitted expansive upper end adapted to be inserted in the bore of the cannon-pinion, substantially as and for the purpose set forth.

2. In a watch-movement, the center-staff, as described, having the slitted expansive upper end, combined with the centrally-bored cannon-pinion *c*, having lower cylindrical bore, *c''*, and upper tapering or enlarged bore, c^3, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 16th day of June, A. D. 1888.

HERMAN E. MURDOCK.

Witnesses:

ALBAN ANDRÉN,

HENRY CHADBOURN.