(No Model.)

E. RIVETT.

GEAR SHAPING ATTACHMENT FOR WATCH MAKERS' LATHES.

No. 389,905. Patented Sept. 25, 1888.

Fig. 3.

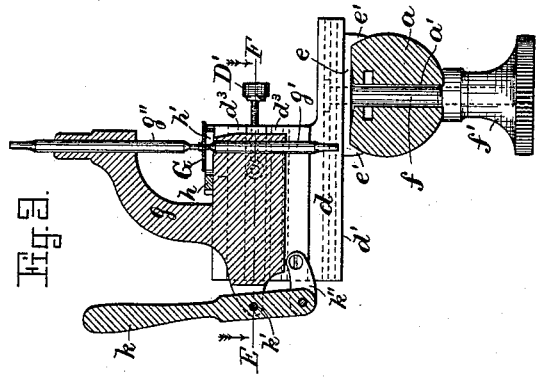


Fig. 2.

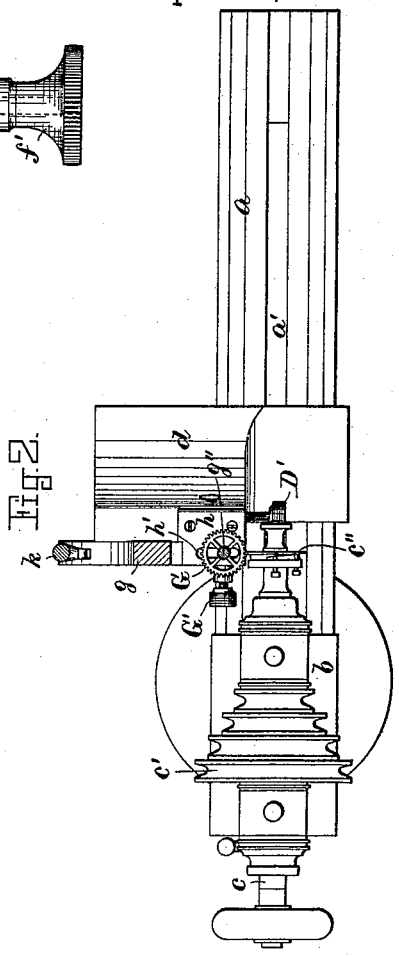


Fig. 4.

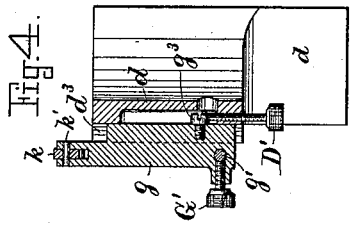
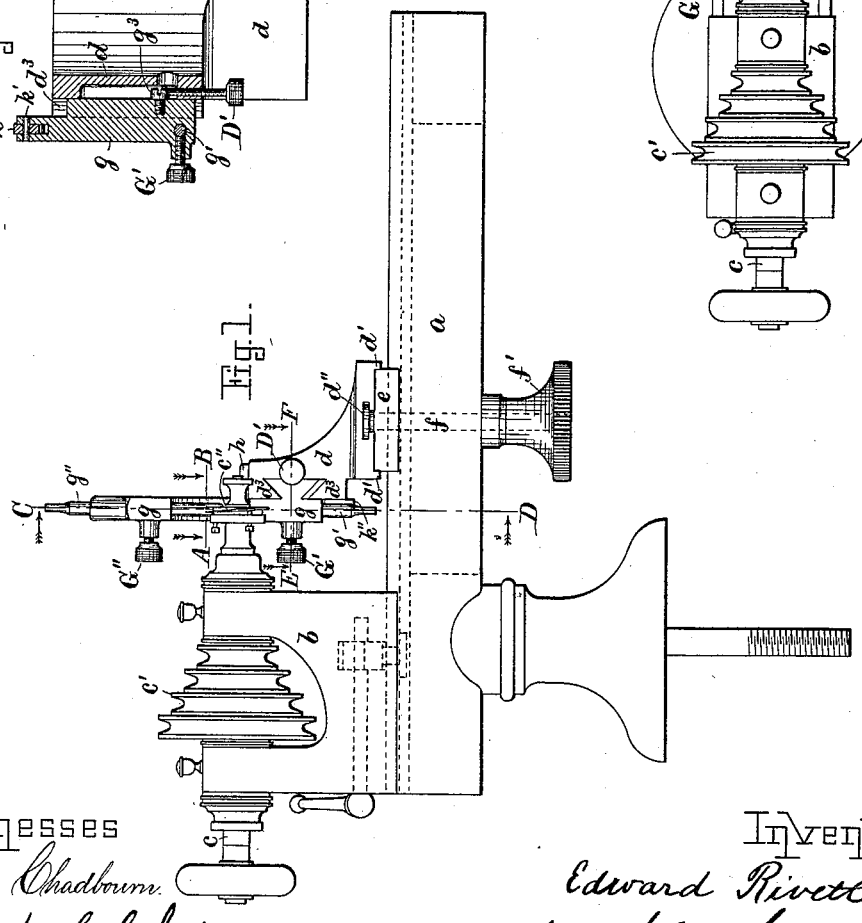


Fig. 1.



Witnesses

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UNITED STATES PATENT OFFICE.

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GEAR-SHAPING ATTACHMENT FOR WATCH-MAKERS' LATHES.

SPECIFICATION forming part of Letters Patent No. 389,905, dated September 25, 1888.

Application filed February 11, 1888. Serial No. 263,668. (No model.)

To all whom it may concern:

Be it known that I, EDWARD RIVETT, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Rounding Attachments for Watch-Makers' Lathes, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in rounding-machines for the purpose of rounding or truing up watch-wheels; and the invention consists of an attachment to an ordinary watch-maker's lathe by means of which such rounding operation can be easily accomplished without the need of an entire special machine or device for this purpose.

The invention is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a front elevation of an ordinary watch-maker's lathe provided with my improved rounding attachment. Fig. 2 represents a horizontal section on the line A B, shown in Fig. 1. Fig. 3 represents a vertical cross-section on the line C D, also shown in Fig. 1; and Fig. 4 represents a horizontal section on the line E F, shown in Figs. 1 and 3.

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

a represents the bed of an ordinary watch-maker's lathe, on which *b* is the head-stock, in bearings in which is journaled the spindle *c*, provided with the cone-pulley *c'*, in the ordinary manner. To the forward end of the spindle *c*, I secure in a suitable manner a spiral cutter, *c''*, of the kind usually employed in rounding-machines.

My improved rounding attachment is constructed and operated as follows:

d is the frame of the attachment, the base or under side of which is preferably provided with guide-lips *d' d'*, adapted to fit on the adjustable tool-holder plate *e*, which latter is provided with guide-lips *e' e'*, as usual, fitting against the side edges of the bed *a*, as is common in watch-makers' lathes. In the base of the frame *d* is made a T-headed slot or groove, *d''*, adapted to receive the correspondingly-shaped head of the fastening-bolt *f*, that passes through the plate *e* and through a slot, *a'*, in the bed-plate *a*, and is provided with a thumb-nut, *f'*, below the bed *a*, as shown in Figs. 1 and 3. It will thus be seen that by this arrangement the frame *d* may be adjusted in the direction of the axis of the cutter-spindle *c* and at a right angle thereto, as may be desired, according to the diameter of the wheel to be cut or rounded, and after being so adjusted it is secured firmly to the bed *a* simply by tightening the nut *f'* below the bed *a*.

In horizontal guides d^3 d^3 in the side of the frame *d* is adjustable to and from the cutter *c''* the wheel-carrying block *g*, provided with lower and upper wheel centering-spindles, *g'* and *g''*, arranged in a vertical position and in a line centrally with each other, as shown in Figs. 1 and 3. The said spindles are adjustable up and down in cylindrical bores made in the lower and upper parts of the wheel-carrying block *g*, and are secured in position with the wheel G to be cut or rounded, journaled, and held between their ends by means of the regulating set-screws G' and G''. (Shown in Fig. 1)

To the top of the frame *d* is firmly secured the hardened-steel rest-plate *h*, that serves as a support for the wheel G while the latter is being cut or rounded by the cutter *c''*, said rest-plate having a slotted perforation, *h'*, made through it for the reception of the lower wheel centering or carrying spindle, *g'*, as shown in Figs. 2 and 3, and thus permitting said spindle, the upper spindle, the wheel held by them, and the wheel-carrying block *g* to be moved to and from the cutter *c''* during the operation of moving the wheel G to or from the cutter *c''*.

The block *g* is moved to and from the cutter *c''* by the following mechanism, viz:

k is a hand-lever pivoted at *k'* to the rear of the wheel-carrying block *g*, as shown in Fig. 3. The lower end of the lever *k* is pivoted to the frame *d* by means of the link *k''*, and it will thus be seen that by swinging the said lever *k* forward and back the block *g* is moved to and from the cutter *c''*.

For the purpose of limiting the forward motion of the block *g* and the wheel G, held by its centering-spindles *g' g''*, so as to obtain the desired depth of cut of the teeth of the wheel under operation, I employ a horizontal adjustable set-screw, D', screwed through the frame *d*, combined with a screw or stop projection, g^3, secured to the wheel-carrying block *g*, as

shown in Fig. 4. By adjusting the position of the set-screw D′ it will be seen that the wheel-carrying block *g* will be limited in its forward motion toward the cutter *c″*, for the purpose as above set forth. The wheel G to be cut or rounded is so held and journaled between the ends of the spindles or centers *g′ g″* that it is free to turn around its axis during the operation of cutting or rounding its teeth.

Small wheels for watches and similar fine movements are generally first cut on a gear-cutting machine, where they are made approximately true; but to obtain a perfect running-gear it is essential that it should afterward be "rounded" or trued up, and for this purpose I use my improved machine and proceed as follows: After having adjusted the position of the frame *d* relative to the cutter *c″*, I journal the gear G to be rounded between the spindles or centers *g′ g″* in such a manner that it is supported on the rest-plate *h*, as shown in Fig. 3. I now regulate the position of the set-screw D′ so that the forward motion of the wheel-carrying block *g* shall be limited according to the depth of the teeth desired to be cut by the cutter *c″* on the wheel G. The cutter *c″* is then set in a quick rotary motion around its axis and the wheel G brought up against it by pressing and holding the lever *k* in its forward position, as shown in Figs. 3 and 4, thus causing the spiral cutter *c″* to round or even the teeth of the wheel G and to turn the latter around its axis until the whole circumference of the wheel is cut or rounded, when it and the block *g* are withdrawn, the now finished wheel removed, and another one put in its place, and so on.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. The frame *d*, having the slotted wheel-rest *h* secured to it, combined with the horizontally-adjustable wheel-carrying block *g* and its vertically-adjustable centering-spindles *g′ g″*, substantially as and for the purpose set forth.

2. The frame *d*, having the slotted wheel-rest *h* secured to it, combined with the horizontally-adjustable wheel-carrying block *g*, its centering-spindles *g′ g″*, and the adjustable stop-screw D′ for limiting the forward motion of the block *g*, as and for the purpose set forth.

3. The frame *d* and its slotted wheel-rest *h*, as described, combined with the adjustable block *g* and its centering-spindles *g′ g″*, and the lever *k*, pivoted to the frame *d* and block *g*, substantially as and for the purpose set forth.

4. The frame *d* and its slotted wheel-rest *h*, and the wheel-carrying block *g*, adapted to slide on said frame *d*, and having means for holding the wheel to be cut, as described, in combination with the shoe *e*, adjustably secured to the bed *a*, and the head-stock *b*, with its rotary spindle *c* and spiral cutter *c″*, 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 8th day of February, A. D. 1888.

EDWARD RIVETT.

Witnesses:
ALBAN ANDRÉN,
HENRY CHADBOURN.