(No Model.) 2 Sheets—Sheet 1.

W. N. WEEDEN.

METHOD OF MAKING PINIONS FOR CLOCKS AND WATCHES.

No. 387,472. Patented Aug. 7, 1888.

Fig. 1.

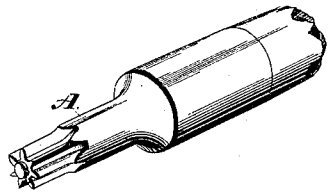


Fig. 2.

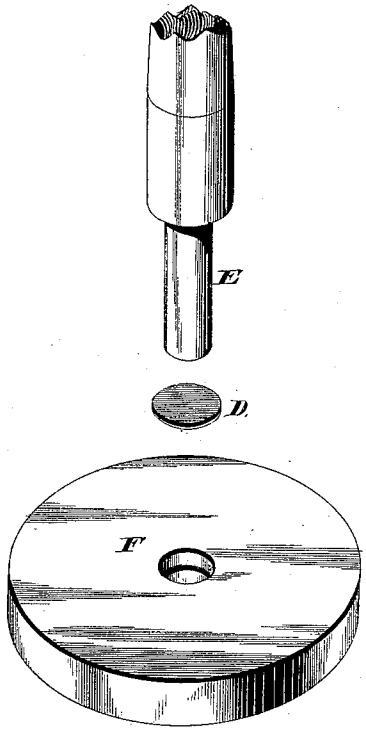
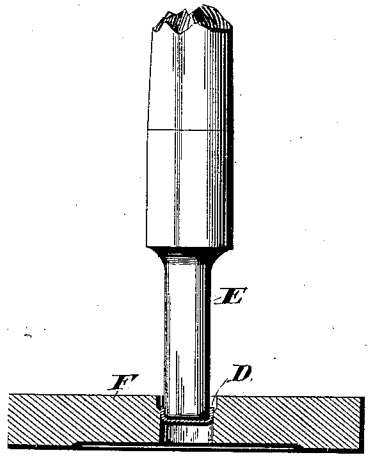


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

W. N. WEEDEN.

METHOD OF MAKING PINIONS FOR CLOCKS AND WATCHES.

No. 387,472. Patented Aug. 7, 1888.

Fig. 4.

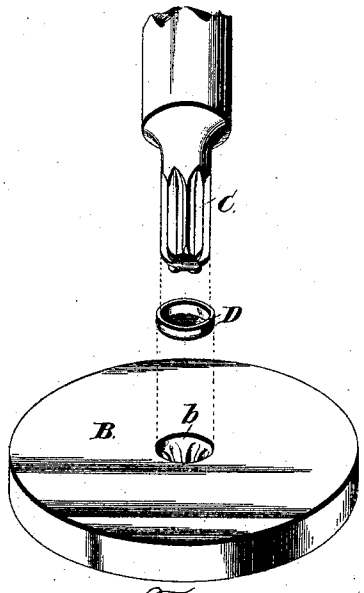


Fig. 5.

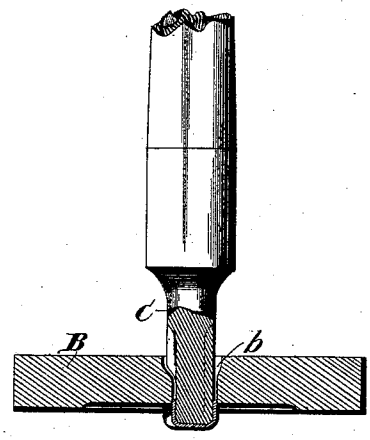


Fig. 6.

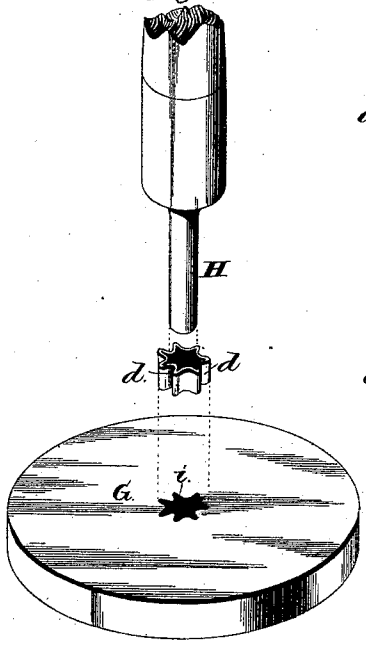


Fig. 8.



Fig. 9.

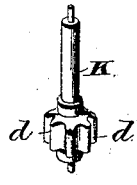
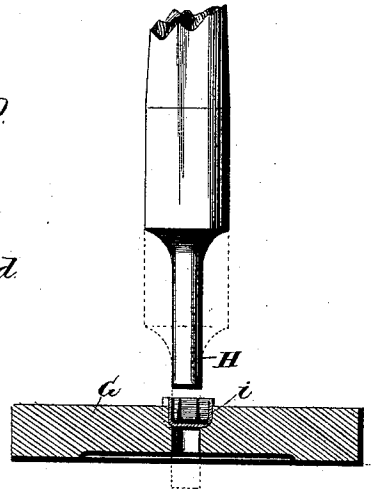


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM N. WEEDEN, OF NEW BEDFORD, MASSACHUSETTS, ASSIGNOR TO THE WEEDEN MANUFACTURING COMPANY, OF SAME PLACE.

METHOD OF MAKING PINIONS FOR CLOCKS AND WATCHES.

SPECIFICATION forming part of Letters Patent No. 387,472, dated August 7, 1888.

Original application filed September 2, 1887, Serial No. 248,602. Divided and this application filed February 25, 1888. Serial No. 265,240. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WEEDEN, of New Bedford, in the county of Bristol, and in the State of Massachusetts, have invented certain new and useful Improvements in Methods of Constructing Pinions for Clocks, Watches, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a drift for use in forming my drawing-die. Fig. 2 is a like view of a preliminary drawing-die and punch and a blank for use with the same. Fig. 3 is a central section of said die and a side elevation of said punch at the instant when they have completed their action upon the blank. Fig. 4 is a perspective view of a finishing drawing-die and punch and a cupped blank. Fig. 5 is a central section of said die and a side elevation of said punch when combined and operating upon said blank. Fig. 6 is a perspective view of the drawn pinion-blank and of the punch and die used for forming an opening in the closed end of the same. Fig. 7 is a central section of said die and a side elevation of said punch immediately before action upon said blank. Fig. 8 is a perspective view of the completed pinion, and Fig. 9 is a like view of the same in position upon an arbor.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to enable pinions for use in watches, clocks, and other similar machinery to be more cheaply constructed than has heretofore been practicable, to which end my said invention consists in the method used for forming pinions from sheet metal, substantially as and for the purpose hereinafter shown.

In the carrying of my invention into practice I employ a series of drifts, one of which, A, is shown in Fig. 1, and has upon one end the shape of the desired pinion, and is used in the formation of a female die, B. Said dies B and B have each a central opening, *b*, that interiorly corresponds to the exterior form of the desired pinion, and such opening decreases in diameter until the smallest corresponds exactly in size as well as shape to the like features of such pinion. Each of the said dies is provided with a punch or male die, C, which corresponds exteriorly to, but is smaller than, the central opening *b*, and resembles in general appearance the drift A used in the formation of such opening.

In the construction of pinions a disk, D, is cut from sheet metal and has a certain predetermined diameter and thickness with relation to the diameter, length, and number of leaves of the finished pinion. Said blank is given the cup shape seen in Figs. 3 and 4 by means of a male drawing-die, E, and a corresponding female drawing-die, F, after which it is submitted to the action of the forming-dies B and C and given the form shown in Fig. 6, its exterior having the exact external size and shape of the finished pinion, with the desired number of leaves, *d*. The blank D is next placed in a recess, *i*, at the center of a die, G, which recess exactly corresponds in size and shape to the like features of the exterior of said blank, after which, by means of a punch, H, there is formed within the lower closed end of the latter a round opening, *d'*, that has substantially the diameter of the space between the inner points of the corrugations which form the spaces or grooves between the leaves *d*. The pinion is now complete, and may be placed upon and secured in any usual way to a suitable arbor, K, where it will operate in all respects like the usual solid pinion, and from the fact that its wearing-surface has been condensed and hardened by the method of construction will possess greater durability than would be practicable if said surface had been cut or otherwise dressed to shape.

Having thus described my invention, what I claim is—

1. The method employed in the forming of pinions, which consists in forcing a disk of sheet metal through dies and giving to the same a cup-shaped form with corrugated sides, substantially as and for the purpose shown and described.

2. The method employed in the forming of pinions, which consists in giving a cup shape to a disk of sheet metal and then passing such blank through drawing-dies until its sides are

corrugated and it corresponds externally in size and shape to the exterior of a toothed pinion, substantially as and for the purpose specified.

3. The method employed in the forming of pinions, which consists, first, in cutting a round blank from a sheet of metal; next, in giving to such blank a cup shape; next, in corrugating the sides of said blank, and, lastly, in forming within the closed end an opening for the reception of an arbor, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 17th day of February, 1888.

WILLIAM N. WEEDEN.

Witnesses:
CHAS. E. BARNEY,
FRANK B. COMINS.