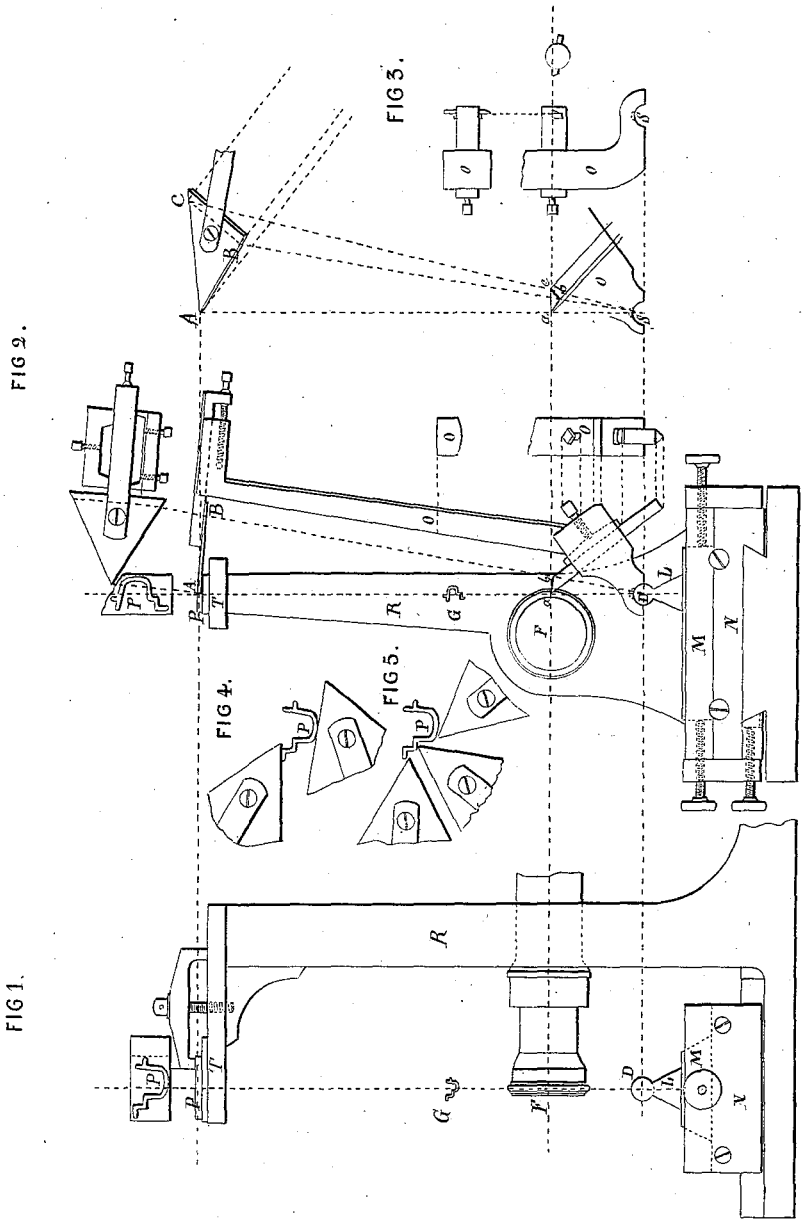
(No Model.)

J. FROSSARD.

MACHINE FOR TURNING WATCH CASES.

No. 312,198. Patented Feb. 10, 1885.



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UNITED STATES PATENT OFFICE.

JOSEPH FROSSARD, OF PORENTRUY, SWITZERLAND, ASSIGNOR TO DUBAIL, MOUNIN, FROSSARD ET CIE, OF SAME PLACE.

MACHINE FOR TURNING WATCH-CASES.

SPECIFICATION forming part of Letters Patent No. 312,198, dated February 10, 1885.

Application filed July 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FROSSARD, of the city of Porentruy, Switzerland, have invented new and useful Improvements in Machines for Turning Watch-Cases and other Similar Articles, of which the following is a full, clear, and exact description.

This invention relates to machines for turning watch-cases or any other similar hollow articles of any desired form; and it consists more especially in the means employed for operating the gravers.

The machines for turning watch-cases heretofore in use have generally been provided with shaped gravers or cutters carried by slides or cylinders and having a uniform motion which is invariable. The turnings thus obtained differ considerably from those obtained with hand-gravers in which the workman roughs out the article by using either the point of the cutter or one of its two faces, after which he finishes the work by rounding off the angles and smoothing it. These several results are obtained in a perfectly satisfactory manner by means of the apparatus of this invention with the aid of the pantograph.

The invention is illustrated in the accompanying drawings, in which Figure 1 represents a side view of that part of the turning-lathe or machine to which the improvements are applied. Fig. 2 is a front view of the same. Fig. 3 shows the graver in position on its holder, while Figs. 4 and 5 show different positions of the feeler or cutter guide with regard to the pattern, which is an enlargement of the same section as the article to be turned.

Referring to the drawings, F represents a watch-band mounted on the head-stock of the lathe, beneath which is a rest consisting of a sphere, D, formed in one with a strong stem, L. The rest is firmly mounted upon two regulating-slides, M N, placed one above the other, and by which the said rest may be adjusted and fixed in any position desired. The head-stock R is prolonged upward and terminated by a bracket which forms a small table, T, upon which the pattern P is placed. This pattern, which is the enlarged representation of the form of article to be turned, is not placed directly upon the table, but upon an intermediate plate, which may be shifted at will. The dimensions of the pattern are in this case five times larger than that of the article to be turned. Supposing it is desired to reproduce the band F, a section of which is represented at G, its dimensions would be increased five times by means of a tracing-point upon a steel plate, of about four millimeters in thickness, from which is obtained the form or pattern P. This latter should be fixed on the table in such manner that a line perpendicular to the bed of the lathe will pass through the center of the pattern P and sphere D, or thereabout. This is not, however, essential, as the workman by a glance of the eye can always insure the requisite precision. The distances which should separate the spherical head of the tool-holder and the feeler are obtained as follows: I trace in the same vertical plane three lines parallel to the bed of the lathe, the first through the center of the sphere, the second through the turning center, and the third through the middle of the pattern. In this particular case, for example, there would be between the first and second lines two inches, between the first and third lines ten inches.

Graver or Cutter Holders.—The graver here described suffices to reproduce all external forms of cases, large or small, and rims, as well as bands. The base of the cutter-holder O has a hemispherical cavity, S, the center of which is at D, of the same dimensions as the sphere upon the rest, which serves as a support therefor. The graver is of triangular form, its cutting-surface *a b c* being such that D *a b* and D *a c* form two equal isosceles triangles whose long sides measure two inches in the present example. The feeler A B C consists of a triangular plate of steel of from about one to two millimeters in thickness. It is fixed to the upper end of the cutter-holder O, with the necessary accessories for its adjustment, which should comply with the following conditions: The five points D *a b* A B should be in the same plane, as should also be the points D *a c* A C. The point A should also be a prolongation of the straight line D *a*, the point B a prolongation of D *b*, and the point C a prolongation of D *c*, so as to form two equal isosceles triangles, D A B and D A C, whose long sides are ten inches in length. It should be noted that these two triangles are

similar to D *a b* and D *a c*, and that their respective sides are in the proportion of five to one. The feeler A B C with its thin edges thus represents the cutting-edge of a graver similar to the one operating, but five times its size. It will be seen that any right line drawn from the center D to any point of the inclined surface of the feeler will be always met by the cutter, at which point it will be divided in the same ratio as the lines D *a* and D A, or D *b* and D C, or D *c* and D C—that is to say, in the ratio of one to five, which is evident without further demonstration.

The holders of the gravers for hollowing out the work are constructed on the same principles, but the "feelers" and gravers are of a dimension suited for the limited space in which they work. Fig. 3 shows the graver mounted on its holder.

The action of the machine will be sufficiently understood from the foregoing description.

The pivoted graver or cutter holder can move in any direction, the gravers also partaking in such movements, while the feeler follows the outline of the pattern, and also moves in all directions. (See Figs. 1 and 2.) In this manner the form of the pattern is reproduced of one-fifth the size, the operation being effected alternately by pressure and by a sliding movement.

To avoid complication, we have supposed the article to be performed in one operation; but a second operation is necessarily required to shape that part held by the clamp, for which purpose the pattern as well as the band is reversed.

Although I have adopted the ratio of 1 to 5 for this machine, it is unnecessary to remark that such proportion may be varied as found desirable.

I claim—

A machine for turning watch-cases of any form by means of plain gravers guided by a pantograph, consisting in the combination of a graver or cutter holder, O, mounted on a ball-and-socket joint, D, the stem of which is adjustable in all directions by the slide-rests M N, a feeler, A B C, mounted upon the graver-holder, of the same form as the graver, but being an enlargement thereof, and always remaining parallel therewith, a pattern, P, or enlarged half-section of the article to be turned, the enlargement of the pattern with regard to the half-section of the article being in the ratio of the relative dimensions of the feeler and of the graver, substantially as shown and described.

The foregoing specification of my improvements in machines for turning watch-cases and other similar articles signed by me this 26th day of May, 1884.

JOSEPH FROSSARD.

Witnesses:

GEORGE GIFFORD,

CHS. A. RICHTER.

Correction in Letters Patent No. 312,198.

It is hereby certified that the name of one member of the firm to whom Letters Patent No. 312,198 was granted February 10, 1885, as assignees of Joseph Frossard, of Porentruy, Switzerland, was erroneously written and printed "Mounin," whereas said name should have been written and printed *Monnin;* and that said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 13th day of April, A. D. 1886.

[SEAL.]

H. L. MULDROW,
Acting Secretary of the Interior.

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.