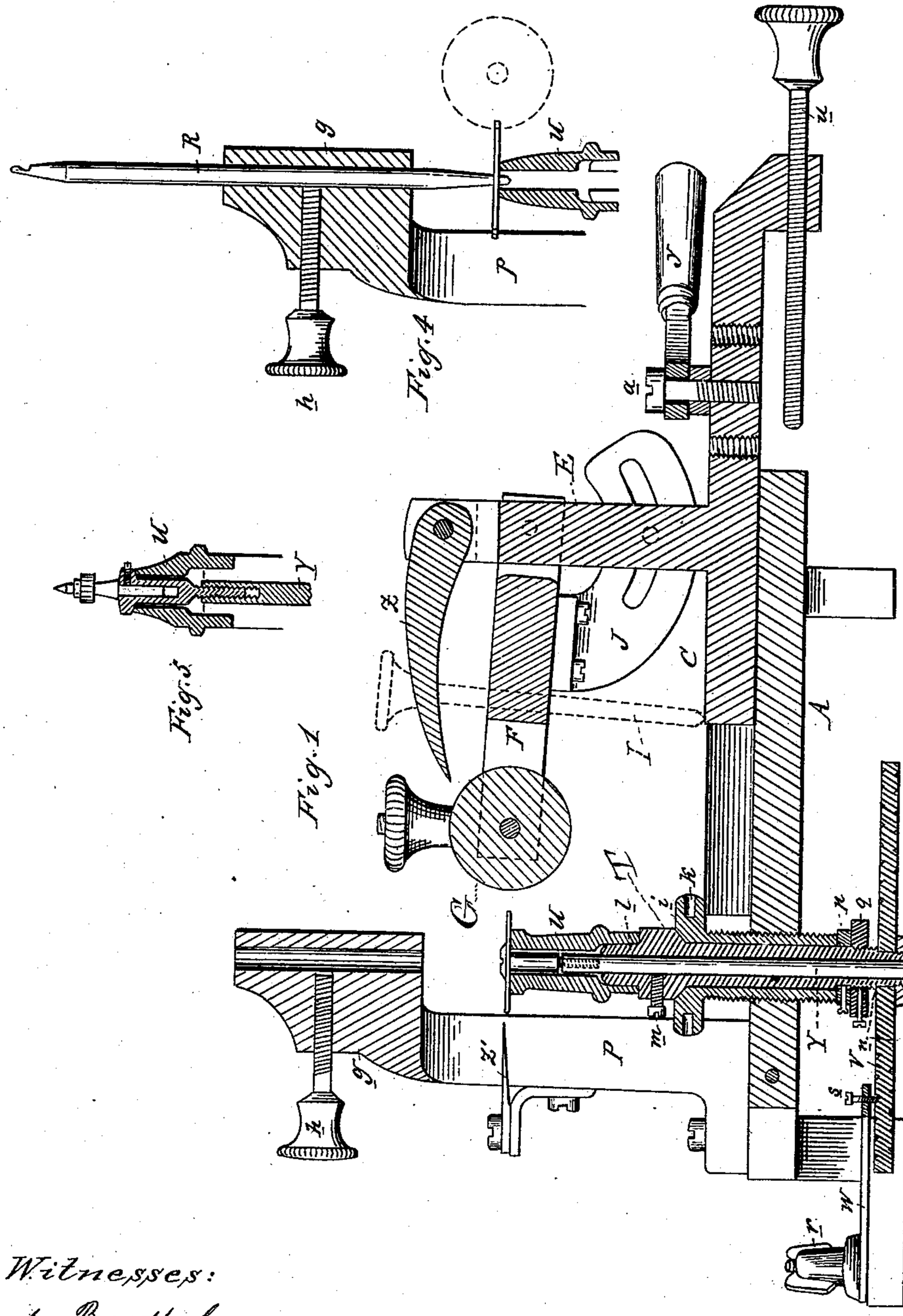
(No Model.)

3 Sheets—Sheet 1.

F. E. JEANJAQUET.

MACHINE FOR CUTTING WATCH WHEELS.

No. 275,494. Patented Apr. 10, 1883.



Witnesses:
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J. Paul Mayer

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(No Model.) 3 Sheets—Sheet 2.

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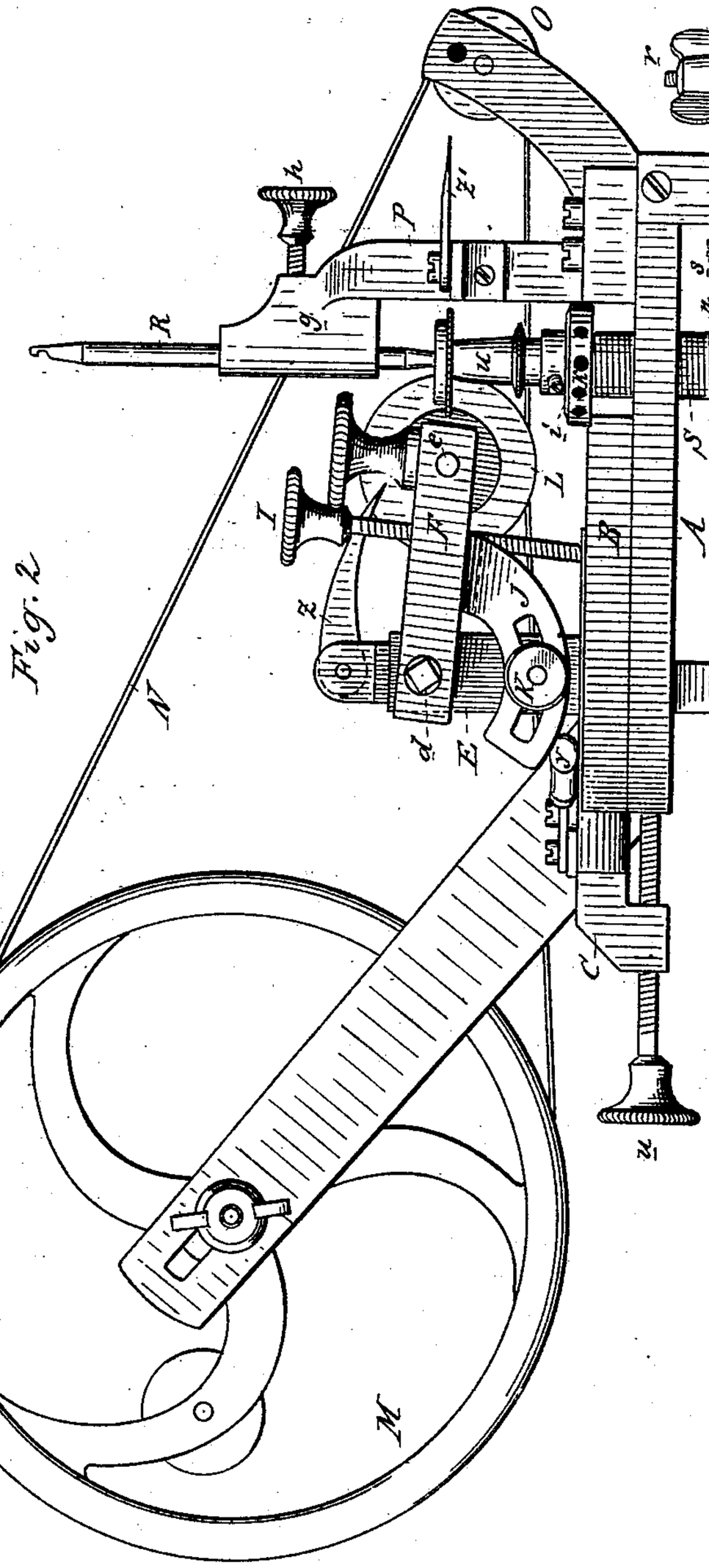
Fig. 2.



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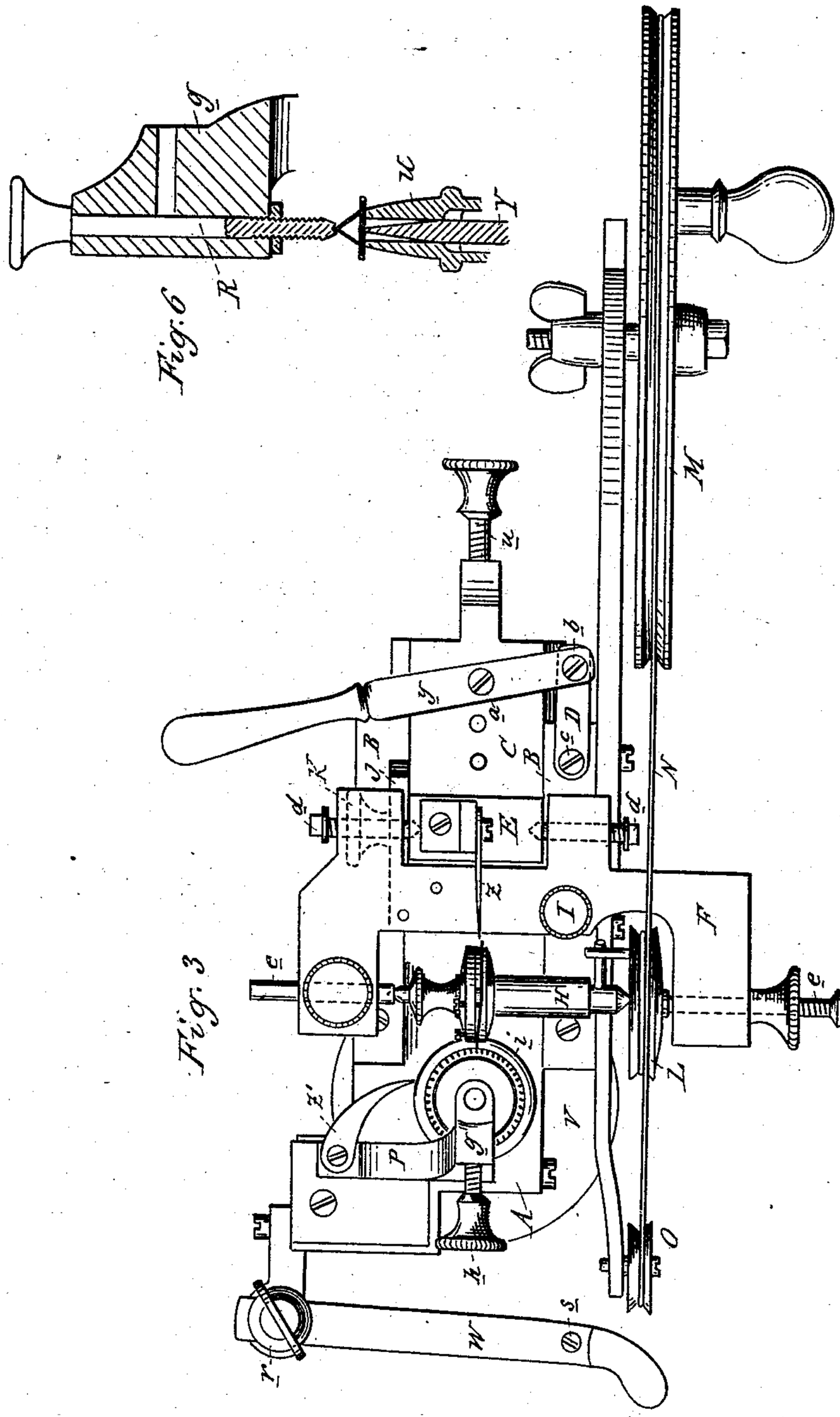

Fig. 6

Fig. 3

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UNITED STATES PATENT OFFICE.

F. EUGÈNE JEANJAQUET, OF DETROIT, MICHIGAN.

MACHINE FOR CUTTING WATCH-WHEELS.

SPECIFICATION forming part of Letters Patent No. 275,494, dated April 10, 1883.

Application filed November 25, 1881. Renewed December 1, 1882. (No model.)

To all whom it may concern:

Be it known that I, F. EUGÈNE JEANJAQUET, of Detroit, Wayne county, Michigan, have invented an Improvement in Machines for Cutting and Recutting Watch-Gear, of which the following is a specification.

The nature of my invention relates to that class of gear-cutting machines ordinarily styled "watch-gear-cutting machines." In machines of this class great and various adjustability of the parts is needed to adapt it to perform its work upon the manifold sizes and kinds of gear used in watch-making, and it is also of like importance to adapt the parts to which the work is secured during the operation to hold properly any kind or size of blank or gear-wheel without the use of numerous or complicated chucks or similar devices, and the improvements on my machine are designed with special reference to these points, all as fully hereinafter set forth, and specifically pointed out in the claims.

In the drawings which form a part of this specification, Figure 1 is a vertical central longitudinal section of my machine. Fig. 2 is a view in elevation. Fig. 3 is a plan. Figs. 4, 5, and 6 illustrate the mode of securing different blanks or gear-wheels for operation.

In the drawings, A is the bed of my machine, which may be either mounted upon a permanent support or be provided, as shown in the drawings, on the under side with a suitable lug for clamping it into a vise. Secured to the top of the bed A are the two parallel cheeks B, within which the slide or carriage C is adapted to have a reciprocating motion imparted thereto by the operator by means of the lever *y*, which is pivoted at the top of the carriage at *a* and at its free end at *b* to a link, D, which in turn is pivoted at *c* to one of the cheeks B. Rising from this carriage C, and forming an integral part therewith, is the standard E, to the upper end of which is pivotally secured by means of the pivot-screws *d d* the swinging cutter-bench F.

G is a circular gear-cutter carried on a mandrel, H, between the adjustable horizontal centers *e e*.

I is a set-screw passing through the cutter-bench, and by impinging against the bed A limits the swing of the bench F on its pivots *d d*.

J is a slotted arc secured to the under side of the cutter-bench, whereby the latter, by means of the set-screw K passing through the slot therein into the standard E, can be firmly held in any desired relative position to the bed. Motion is given to the cutter by means of the grooved pulley L, which derives its motion from the hand-wheel M by means of a cord, N, passing from the hand-wheel M around the pulley L and over another pulley, O, in the well-known manner. The pulleys M and O are adjustably secured upon suitable brackets fastened to the bed of the machine. This arrangement for imparting motion to the cutter gives to the pulley L entire freedom to partake of a reciprocating motion of the carriage without interfering with the free rotation of the parts.

P is an overhanging standard rising from the bed of the machine. The overhanging head *g* thereof is provided with a vertical bore, in which the vertically-adjustable centering-spindle R snugly fits, and can be held in any desired position therein by a set-screw, *h*.

S is a threaded barrel, vertically screwed through the bed of the machine, and terminating at its upper end in a flange, *i*, which contains holes *k* upon its face for the purpose of allowing the barrel to be easily screwed up or down for the purposes hereinafter described. This barrel S is open at both ends, and its cylindrical bore conically enlarges at its upper end.

T is a hollow spindle, fitting snugly into the bore of the barrel. Its upper end is conically enlarged to fit the conical enlargement of the bore of the barrel, and terminates in the head *l*, provided with the set-screw *m*.

U is a thimble, removably fitted upon the head *l* of the spindle T, and its bore corresponds with the bore of the latter. The spindle T projects below the barrel S and forms a shoulder or offset at *n*, against which the divisor-plate V is seated, and firmly held thereon by the thumb-screw *o*, screwed upon the threaded lower end of the spindle, so that if the divisor-plate is rotated the spindle T and thimble U have to follow in this movement. The vertical displacement of the spindle T is prevented by the collar *p* and nut *q*.

W is a spring-arm, pivotally secured by a thumb-screw, *r*, to the bed of the machine, and carries near its free end the screw stop-pin *s*,

adapted to engage into the division-marks of the divisor-plate, which is of the usual construction.

Y is a centering-spindle entered into the bore of the spindle T, into which it snugly fits from below. It is provided with the head *t*, and its upper end may be variously formed, either with a screw-socket, as in Fig. 5, or pointed, as in Fig. 6, or otherwise, as the requirements of the work to be held thereon suggest, the same considerations governing also the form of the lower end of the upper centering-spindle, R. The axial line of both centering-spindles R and Y have to correspond exactly.

Z and Z′ are the usual gages, attached to the machine on any convenient and suitable place, one being for gaging the position of the work, the other the position of the cutter.

In practice, if it is desired to cut a gear, the blank is secured upon the top of the thimble U, of which various assorted sizes have to be kept on hand to choose the most suitable one adapted to give as large a support as possible without interfering with the work. For securing the work upon the thimble U, the centering-spindle Y is always used as the main point of departure. In Figs. 1, 5, and 6 are shown three typical modes of fastening such work. In the latter mode the upper and lower centering-spindles are brought into use. Now by means of the gages the work and the cutter are put in proper relative position, the threaded barrel S allowing the work to be raised or lowered to the proper height; or, if preferred, the cutter-bench F may be raised or lowered and held in the proper position for work by means of the set-screw K. Now, if motion is given to the parts and the carriage C advanced by means of the lever *y*, the cutter is enabled to perform its work. The forward movement of the carriage is limited by the set-screw *u*, whereby the depth of the gear is controlled. After each cutting the carriage is retracted, the divisor-plate turned one notch, and the operation of cutting repeated. By reason of the construction and arrangement of the parts the blank has to rotate in the same degree as the divisor-plate. For cutting a crown-gear wheel, the cutter is brought in proper position right over the work, with the set-screw K loosened so as to allow the workman to operate the cutter-bench with the hand, lowering it to cut and raising it to allow the work to be rotated by the divisor-plate, and the depth of the gear is controlled by the set-screw I. The adjustability of the barrel S in this kind of work is very desirable, and often necessary. For recutting a gear-wheel, the same is placed upon the thimble U and centered by means of the tapering end of the upper spindle, R, without, however, depriving it of the facility to rotate freely thereon, as in such cases the use of the divisor-plate is dispensed with, a proper guide in the cutter rotating the wheel as the work progresses.

I abstain from giving a more extended description of the scope of the machine for cutting and recutting, as the typical examples shown in the drawings will suggest to the workman in each case the proper way to chuck his work for operation.

It will be observed that in my machine I dispense entirely with the use of complicated chucks, using only vertical adjustable centering-spindles, which, with simple additions devised by the workman himself, will enable him to perform a large variety of work.

It will be easily understood that if the cutter-bench F would form an integral part of the standard E the range of the work the machine is able to perform would be but little restricted thereby, although its adjustment for different work would require more time and care.

What I claim as my invention is—

1. The combination of the threaded barrel S, conically enlarged at its upper end, the spindle T, provided with a corresponding conical enlargement and head, *l*, the collar *p*, and screw-nut *q*, divisor-plate V, spring-arm W, and thimble U, when combined in the manner described to form a vertical adjustable rotary support, substantially for the purpose specified.

2. In a watch-gear-cutting machine, the combination of a stationary support, reciprocating carriage C, swinging cutter-bench F, slotted arc J, and set-screw K, all combined and operated in the manner described and shown.

3. The combination of the bed A, cheeks B, carriage C, lever *y*, link D, cutter-carrying bench F, stop-screw *u*, and stationary support, all combined and operated in the manner described and shown.

4. In a watch-gear-cutting machine, the combination of the hand-wheel M, pulleys L and O, cord N, swinging cutter-bench F, mandrel H, and gear-cutter, when combined and operating as and for the purposes specified.

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