M. T. DENNE.

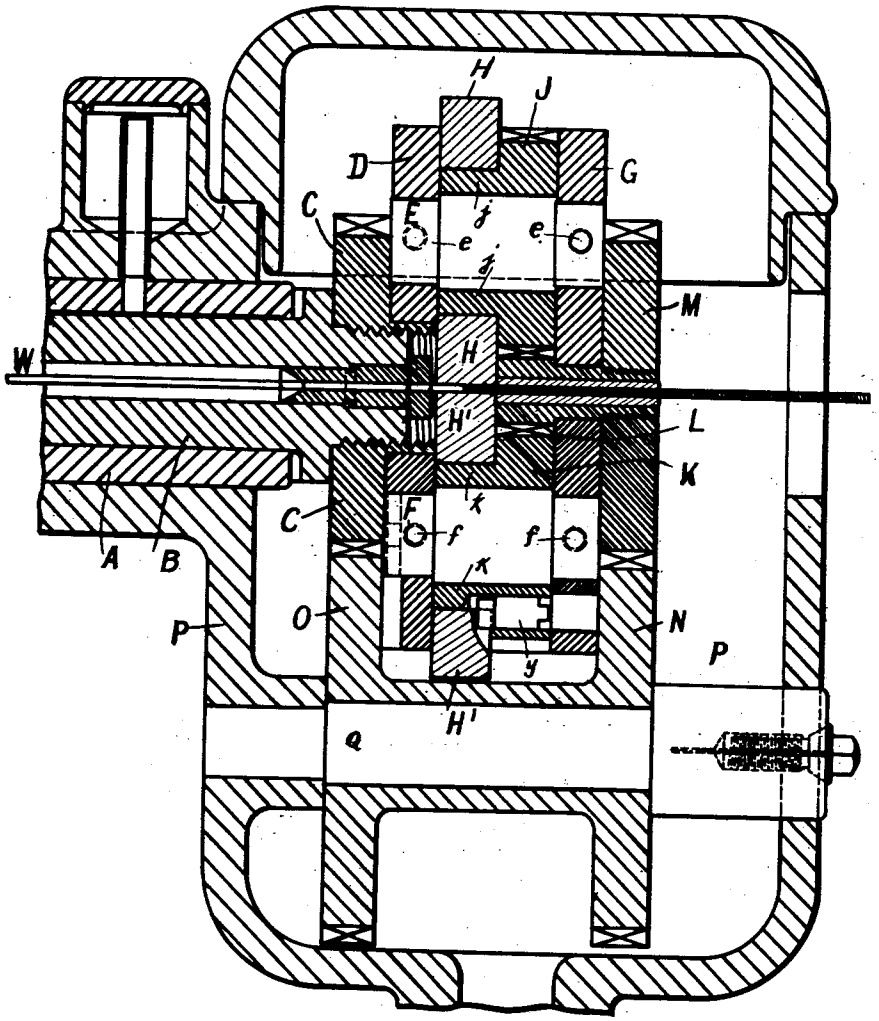
MACHINE OR APPARATUS FOR FORMING SCREW THREADS ON WIRE BY ROLLING.

APPLICATION FILED OCT. 9, 1907.

1,039,707. **Patented Oct. 1, 1912.**

3 SHEETS—SHEET 1.

Fig. 1.



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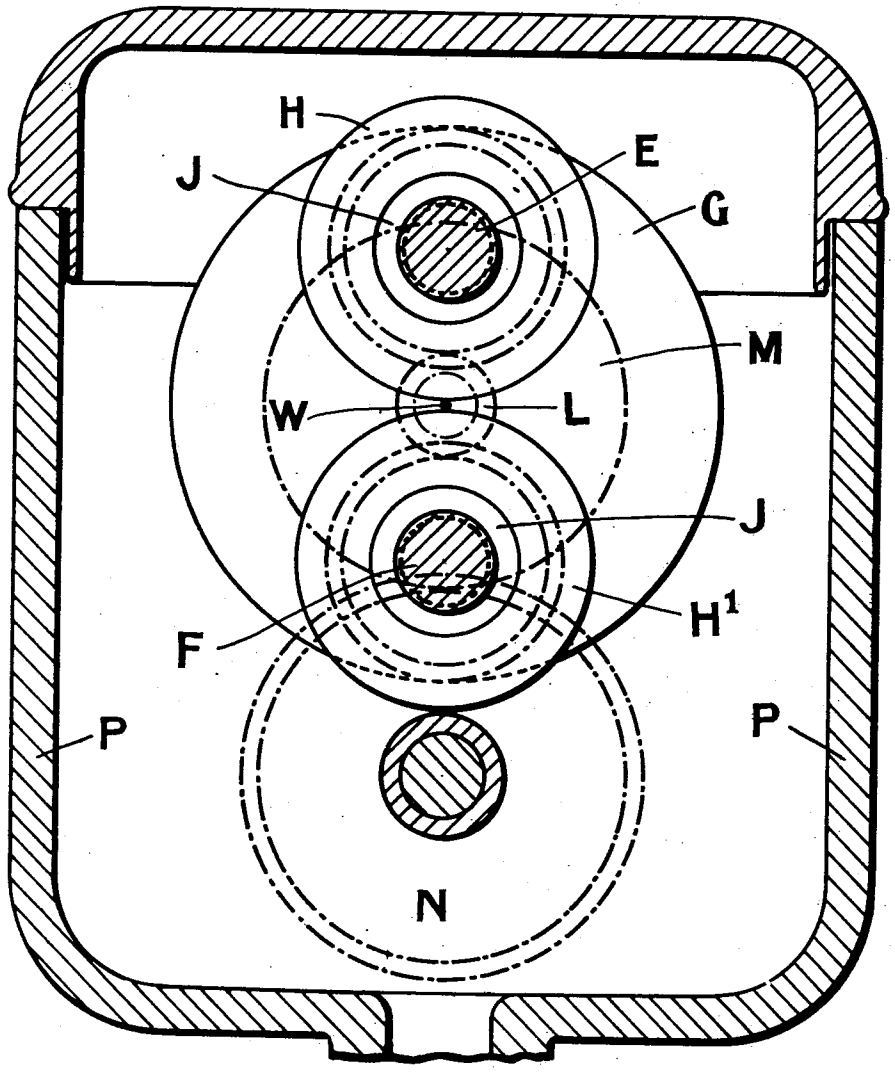
3 SHEETS—SHEET 2.

FIG. 2.



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3 SHEETS—SHEET 3.

FIG 3

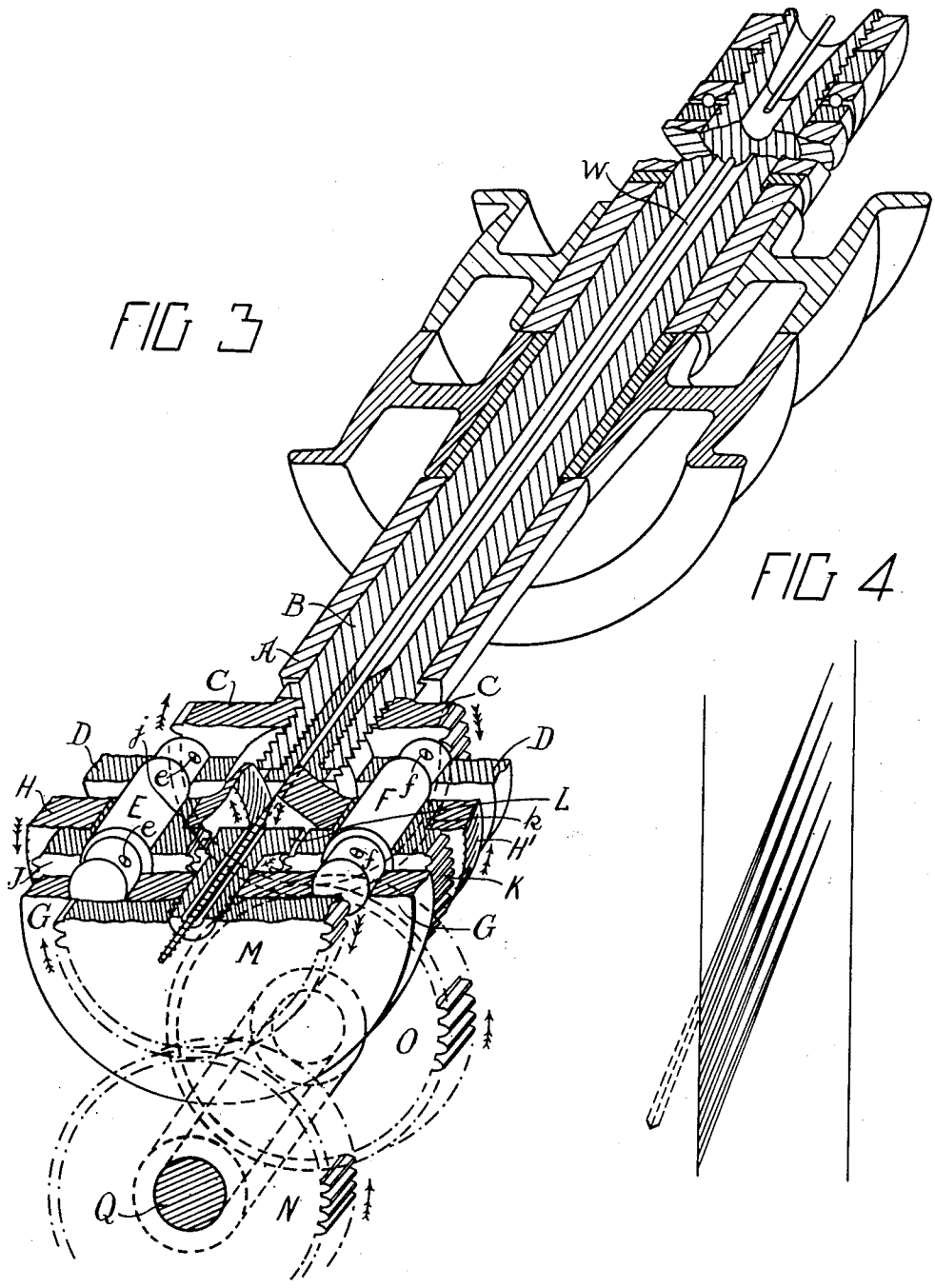

FIG 4

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UNITED STATES PATENT OFFICE.

MARK THOMAS DENNE, OF RUSHDEN, NORTHAMPTON, ENGLAND.

MACHINE OR APPARATUS FOR FORMING SCREW-THREADS ON WIRE BY ROLLING.

1,039,707. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed October 9, 1907. Serial No. 396,559.

To all whom it may concern:

Be it known that I, MARK THOMAS DENNE, a subject of the King of Great Britain and Ireland, residing at Rushden, Northamptonshire, England, have invented new and useful Improvements in Machines or Apparatus for Forming Screw-Threads on Wire by Rolling, of which the following is a specification.

This invention has reference to improvements in machines or apparatus for forming screw threads on wire and, more particularly, in machines of that type in which two roller dies are mounted upon a rotatable carrier through the axis of which the wire passes, the dies engaging the wire on opposite sides and automatically feeding it forward as they roll around it; and the main object of the invention is to obviate the necessity in machines of this kind as hitherto constructed of providing special means for preventing the wire twisting or turning as it is being operated on.

In the accompanying drawings Figure 1 is a vertical central sectional view and Fig. 2 a transverse sectional view in front of the dies; Fig. 3 is a perspective view and longitudinal section of the wire-carrying spindle with a wire in position, and the die rollers with their operating gears, the direction of rotation of the die rollers and gears being indicated by arrows; Fig. 4 is a development of the spiral grooves of the die rollers of my improved machine in which—

A is a bearing carried by a suitable frame and B a spindle supported in said bearing and which has rotary motion imparted to it in any well known manner. The spindle has a central aperture through which the wire to be formed with a thread is entered, and it carries at its end a toothed wheel C to which a plate D is fixedly attached. The said plate D is formed with two apertures at positions diametrically opposite to and equidistant from the axis of rotation of spindle B in which apertures the ends of spindles E, F are inserted and fixed by screws *e*, *f* or otherwise, the opposite ends of said spindles being similarly carried by a plate G, the two plates D, G forming with the spindles E and F a rigid frame.

Rotatably mounted on the spindles E, F are toothed wheels J, K which are both in gear with a toothed pinion L located centrally between them, which pinion has its bearing in a central aperture in the plate G and on the free end of which a toothed wheel M is fixedly attached. The gear wheels J, K are formed with sleeve-like extensions *j*, *k*, on which die rings H, H′ are respectively adjustably fixed, the said die rings having on their outer peripheries spiral grooves of suitable shape whereby the threads will be formed or rolled on the wire in the manner well known, said die rings being of course spaced the requisite distance apart. The pinion L with its extension has a central aperture for the passage of the wire after having had a screw thread formed thereon by the dies H, H′.

Rotary motion is imparted by the gear C to the gear M through the instrumentality of carrier wheels O, N, which are made with or attached to a common sleeve rotatably mounted on a spindle Q carried by the box or head P which I make to inclose the mechanism.

It will be obvious that if the gear wheels C, M, were to be rotated at equal speeds the dies H, H′, would not roll a thread on the wire as the same part of the dies would constantly be in contact with said wire. It is therefore necessary to cause the wheels C, M, to rotate at slightly different speeds in order to cause the dies to roll over the wire and form a thread.

I have found in practice that if the wheel C be made with 29 teeth and the wheel M with 30 teeth and the carrier wheels O, N, with 37 and 36 teeth respectively (the pinion L, gears J, K, and dies H, H′, having dimensions substantially as illustrated and determined by the diameter of the wire) the wire will be fed forward at a reasonably quick speed and yet not so quickly as to prevent the proper formation of the screw threads.

The parts being dimensioned as described insures that as the roller dies are carried around the wire their peripheries will move more rapidly than if there were simply a rolling contact of said peripheries with the wire, thereby causing said dies to have a gliding or quasi abrading action on the wire in a direction opposite to that of the forward travel of the roller dies in their passage around the wire. This quasi abrading action tends to rotate the wire in a direction opposite to that in which the dies move around the wire and prevents the wire being carried with or rotated by the dies in their said movement around the wire. By this

action of the dies the employment of a special device to grip the wire to prevent its being rotated by the roller dies in their passage around the wire—and which would be necessary if the peripheries made a rolling contact with the wire—is rendered unnecessary.

It will be observed from the drawings that the roller dies will rotate on their own axes in the opposite direction to that in which they rotate around the wire.

In addition to being instrumental in feeding or moving the wire axially one advantage derived by causing the dies to glide on the wire as described is that the thread is formed with great exactitude which obviously is an important consideration.

I wish it to be understood that I do not confine myself to the particular relative dimensions of parts shown as these may within limits be varied without departing from the spirit and scope of my invention within the scope of the appended claim.

By reason of all the moving parts (with which I do not include the carrier wheels O, N, as they do not rotate around the wire) being either concentric with the wire or placed diametrically opposite each other at either side of and at equal distances from their axis of rotation, the parts are in proper balance without my having to provide special counterpoises or the like. The weight of the machine and the vibration in running are thus reduced to a minimum and the power required to drive it is less than would otherwise be the case. My improved machine has, further, the advantage of being extremely simple in construction and inexpensive to make.

What I claim as my invention and desire to secure by Letters Patent is:—

In a machine having roller dies for forming screw threads on wire by rolling, means to rotate said dies around the wire while pressing thereon and means to rotate said dies on their own axes at a speed greater than that necessary to produce rolling contact of their peripheries with the wire.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARK THOMAS DENNE.

Witnesses:
A. E. WILLIAMS,
H. D. JAMESON.