

(No Model.)

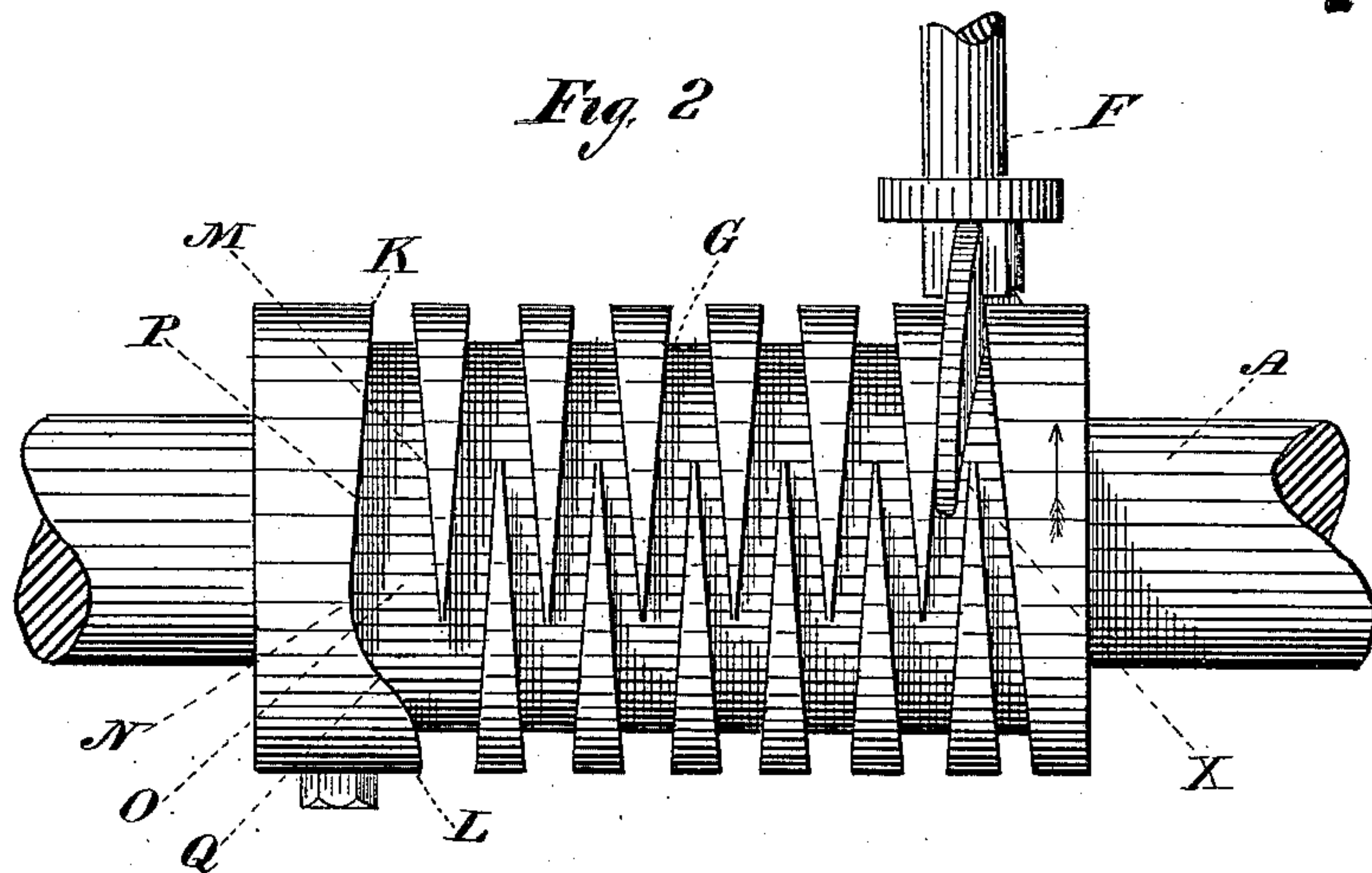
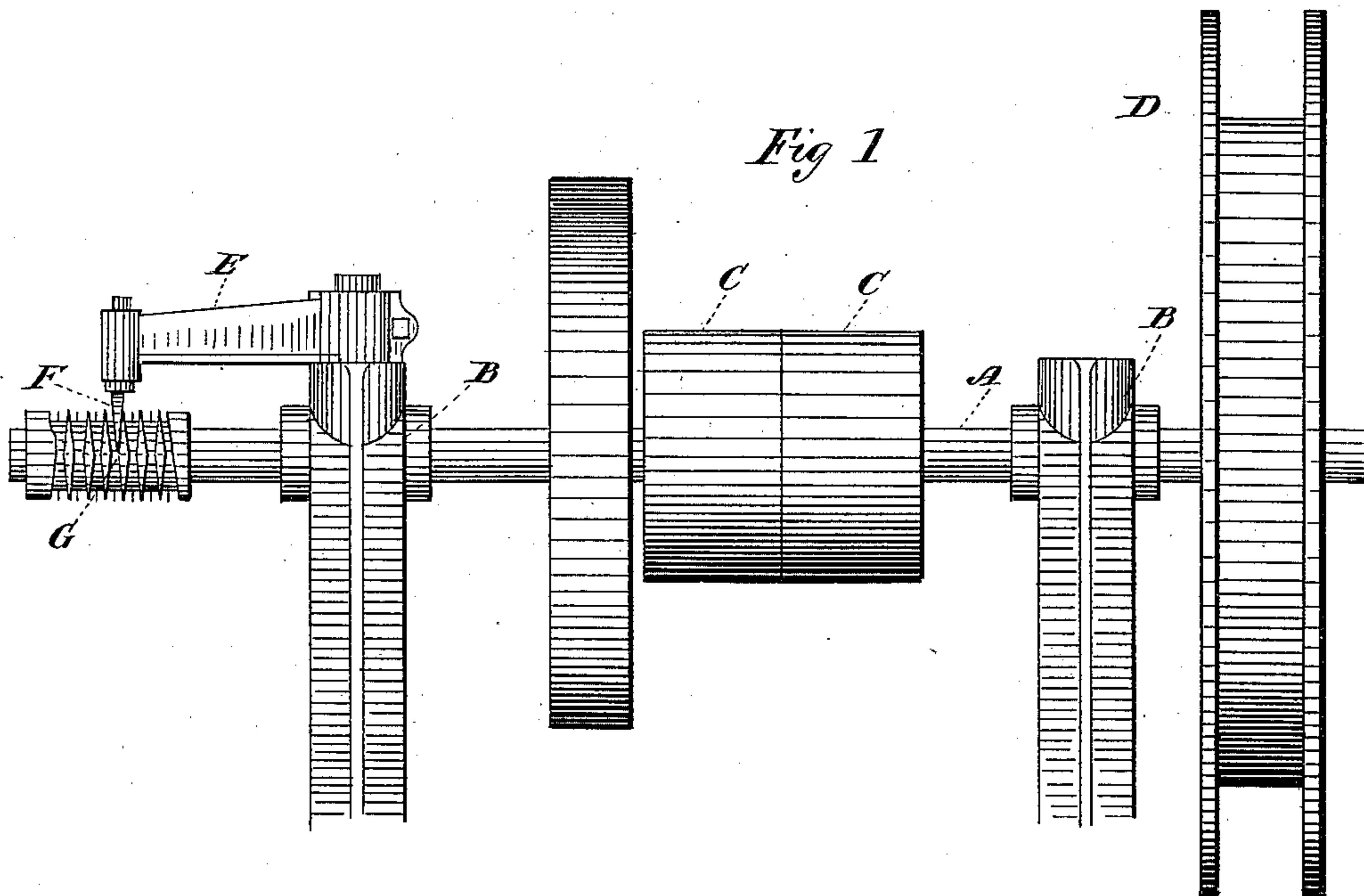
2 Sheets—Sheet 1.

H. BORCHARDT.

SWITCH THREAD.

No. 299,614.

Patented June 3, 1884.



Witnesses
S. S. Williamson
S. Hubbard

Inventor
Hugo Borchardt
By Walter Smith
Atty's.

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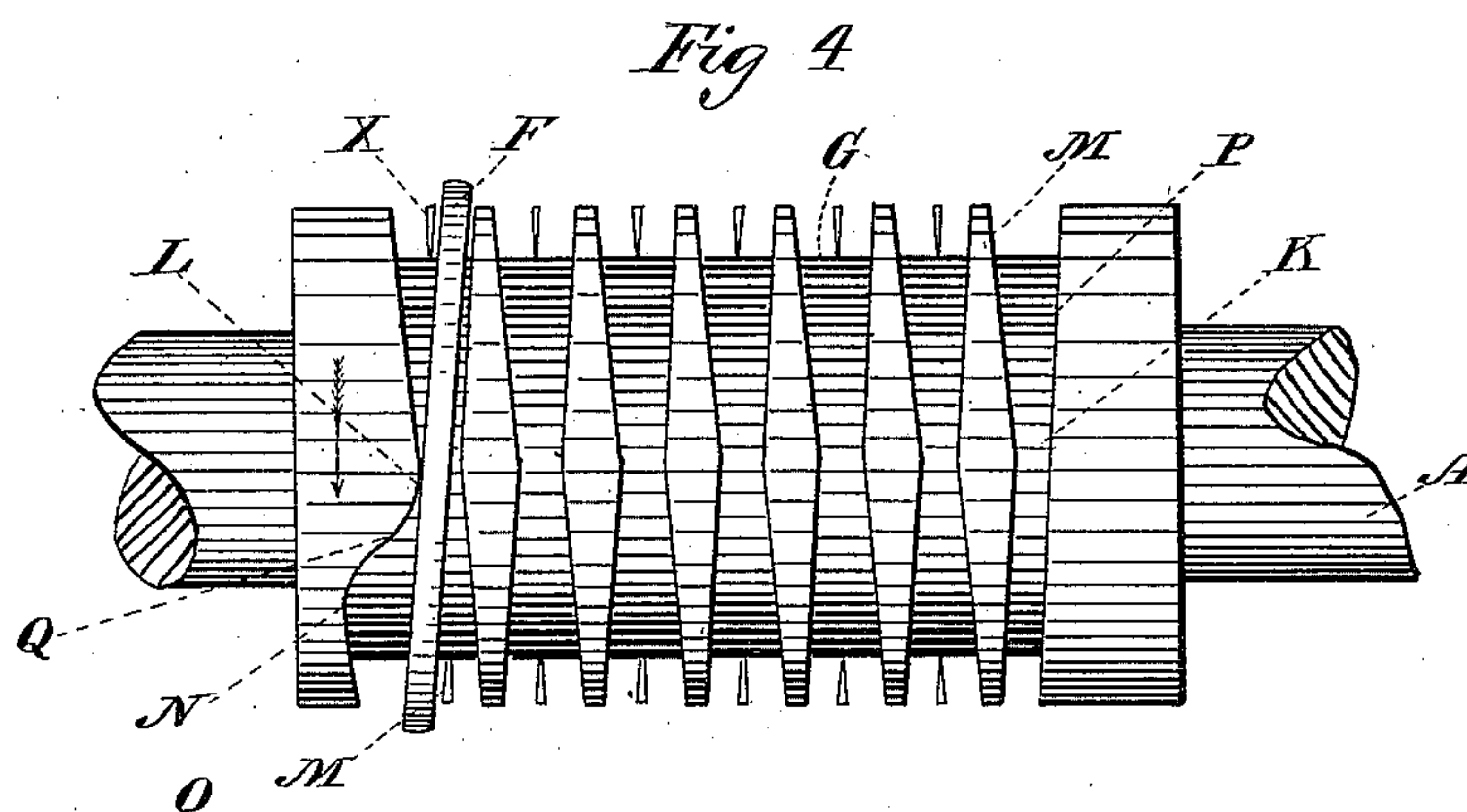
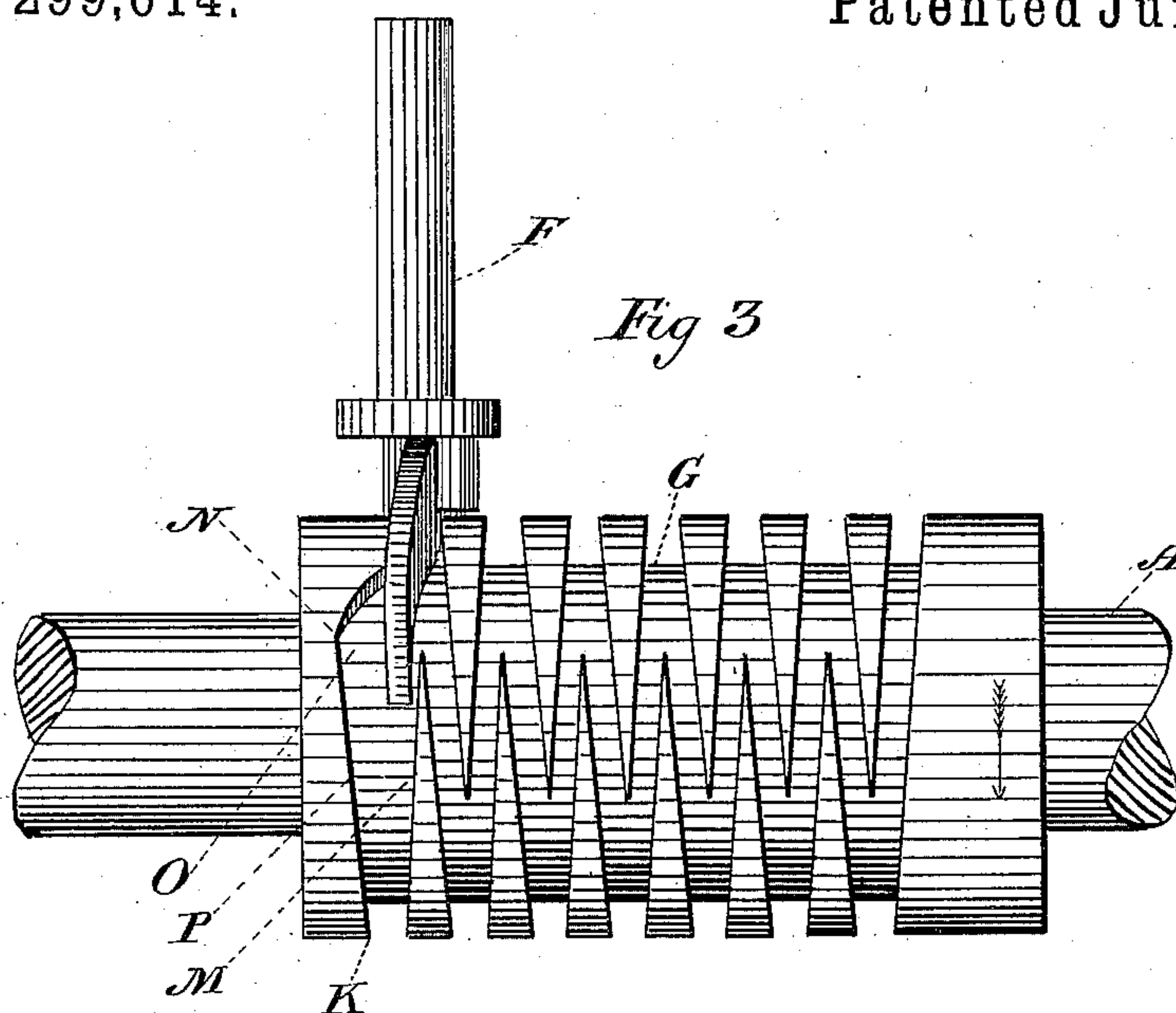
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By Wooster Smith
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UNITED STATES PATENT OFFICE.

HUGO BORCHARDT, OF BRIDGEPORT, CONNECTICUT.

SWITCH-THREAD.

SPECIFICATION forming part of Letters Patent No. 299,614, dated June 3, 1884.

Application filed November 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, HUGO BORCHARDT, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Switch-Threads; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to wire machinery, and has for its object to produce a reeling device which shall be simple in construction, economical in cost, practically impossible to get out of repair, and in which the reverse movement is caused to take place with absolute certainty.

With these ends in view my invention consists in the details of construction as hereinafter fully explained, and then specifically designated by the claims. As is well known, in the act of winding, the reel or spool upon which the wire is wound is caused to move from right to left, and vice versa, so that the wire is wound thereon in even layers. This movement is produced by cams or in any other well-known manner. A common and very simple means of producing this movement is a swiveled traveler working in a switch-thread upon the same shaft upon which the reel is mounted, said shaft being so journaled as to permit of the necessary longitudinal movement. Heretofore said switch-thread or worm has been so constructed that the width of the thread was the same at all places, the thread at each end at the point where the traveler reverses being no wider than at other places. For example, at the point indicated by K in Fig. 4, in machines of this class as now constructed, the wall P instead of trending to the right trends to the left, and is parallel with wall M. The effect of this construction is to necessitate that the travelers be made very thin, and also results in great wear upon the travelers, so that they soon become worn to such an extent as to frequently fail to reverse when the end of the thread is reached, in addition to which they often do reverse when the traveler has not reached the end of the thread, thus causing the wire to be wound irregularly, and necessitating that a constant watch be kept

upon the machine, as well as frequent substitution of new travelers for those which have become worn. These defects are wholly obviated in my improved device, in which the outer wall of the switch-thread is given an outline at each end, which enables me to use a much thicker and heavier traveler, and renders a failure to reverse at each end of the thread an absolute impossibility, while the thickness of the traveler itself prevents it from reversing at any point between the ends of the switch-thread.

For the purpose of enabling others to understand and use my improved device, I will proceed to describe the same, referring by letters to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a portion of the frame, with the shaft journaled therein, and showing the pulleys, reel, switch-thread, &c., mounted on said shaft. Figs. 2 and 3 are elevations of opposite sides of the switch-thread, with the traveler in perspective, showing the position of the traveler from opposite sides at the moment that it begins its reverse movement. Fig. 4 is a plan view of the switch-thread and traveler, the traveler-spindle being removed.

Similar letters indicate like parts in all the figures.

A is the shaft, journaled in boxes B, which permit free longitudinal motion thereof. C C are belt-pulleys. D is the reel or spool upon which wire is wound. E is the traveler-arm, and F the traveler swiveled therein. G is the switch thread or worm, mounted on shaft A, which engages the traveler, and thereby imparts a longitudinally-reciprocating movement to the shaft. These elements are all well known, and are in common use for various purposes. In switch-threads as now constructed, however, the wall P, at each end of the switch-thread, between the points K and L, (see Fig. 2,) is a straight line running parallel with wall M.

In Fig. 4, wall P, instead of trending to the right, as I have shown it, in all switch-threads as now manufactured trends to the left from point K, walls P and M being parallel. In my improved construction walls M and P (see Figs. 2 and 4) diverge in a mechanical ratio

equal to the pitch of the thread, wall P being in fact a continuation of the old thread. From point K to point N (see Fig. 2) wall P is a straight line diverging outward in mechanical ratio from wall M, so that at the point N an open space or pocket, O, is formed. From this point the wall Q trends inward to point L. The exact shape of the wall at this place is not an important feature of my invention; but it is deemed preferable to curve the wall outward at point N and to curve it inward at point L.

Fig. 3 is a view of the switch-thread from the side opposite to which Fig. 2 is made, the traveler being in the same position in both figures—*i. e.*, having just commenced the reverse movement. The direction of rotation in Figs. 2, 3, and 4 is indicated by arrows.

Fig. 4 is a plan view with the parts in the same position as in Fig. 3.

Figs. 2 and 4 will show the traveler as having just engaged the reverse thread, as at X, while Fig. 3 shows the position of the opposite point or end of the traveler at the same moment. This open space has three functions. In the first place, it enables me to use a much heavier traveler. In fact, I use one almost as wide as the groove itself. This in itself renders the act of reversing at any intermediate point an absolute impossibility. In the second place, it does away with a large proportion of the wear on the traveler each time its movement is reversed; and in the third place walls P and Q, with which the traveler comes in contact each time it reaches the end of the switch-thread, act to give the traveler sufficient rotation in its socket to turn its point inward beyond the line of the reverse thread, the beginning of which I have indicated by X in Figs. 2 and 4.

The operation of my device is best understood in connection with Figs. 3 and 4. The direction of rotation is indicated by the arrow. As the traveler approaches the end of the switch-thread, it necessarily follows wall

P (see right of Fig. 4 and left of Fig. 3) until it reaches point N, where the point of the traveler is turned and its new line of movement maintained as it passes along wall Q. It is of course impossible to illustrate each change in the position of the traveler.

Fig. 4 shows a point in the rotation of the switch-thread at which the reverse movement has commenced, the traveler having started in the reverse thread, but the position of the parts is such as to clearly indicate the action of wall Q on the traveler. It is of course not essential that the traveler-arm should be stationary, as it would be but an obvious reversal of parts to make shaft A stationary in its bearings and allow it to impart a longitudinally-reciprocating movement to the traveler-arm.

Having thus described my invention, I claim—

1. A switch thread or worm in which the wall at each end diverges outward from the inner wall in a mechanical ratio equal to the pitch of the thread, beginning at the point where the thread reverses and extending into an open space or pocket, from the bottom of which the wall extends inward toward the inner wall.

2. A switch-thread whose outer walls at each end are cut away to form open spaces or pockets O, substantially as and for the purpose set forth.

3. A switch-thread in which the outer wall between point K and point N is a straight line diverging outward from wall M in a mechanical ratio equal to the pitch of the thread, and from point N to point L diverging inward toward the opposite wall, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HUGO BORCHARDT.

Witnesses:

K. B. PORTER,

A. M. WOOSTER.