

(No Model.)

2 Sheets—Sheet 1.

E. TIFFANY.

FALLING BAR FOR STRAIGHT KNITTING MACHINES.

No. 408,363.

Patented Aug. 6, 1889.

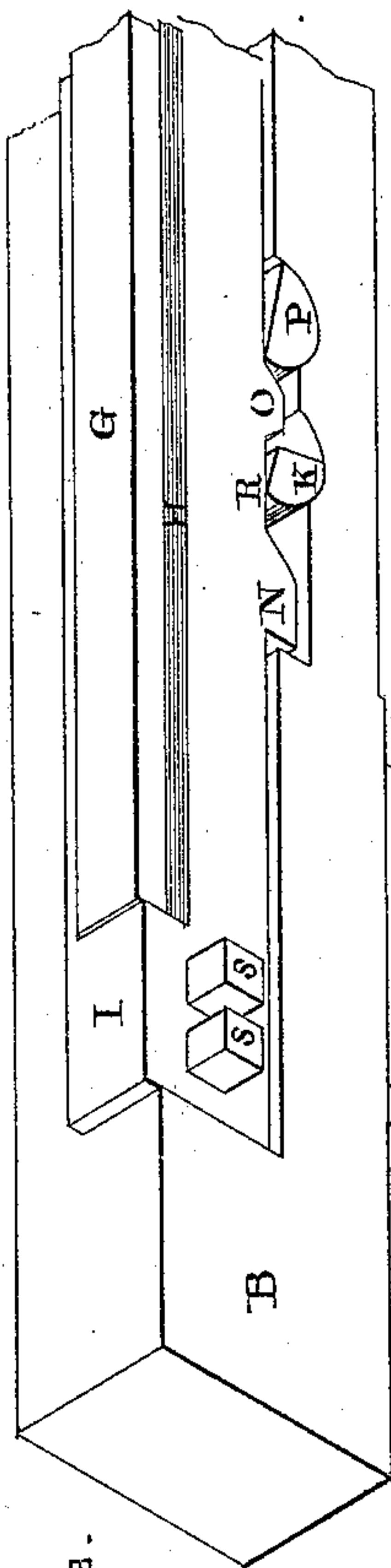


FIG. 3.

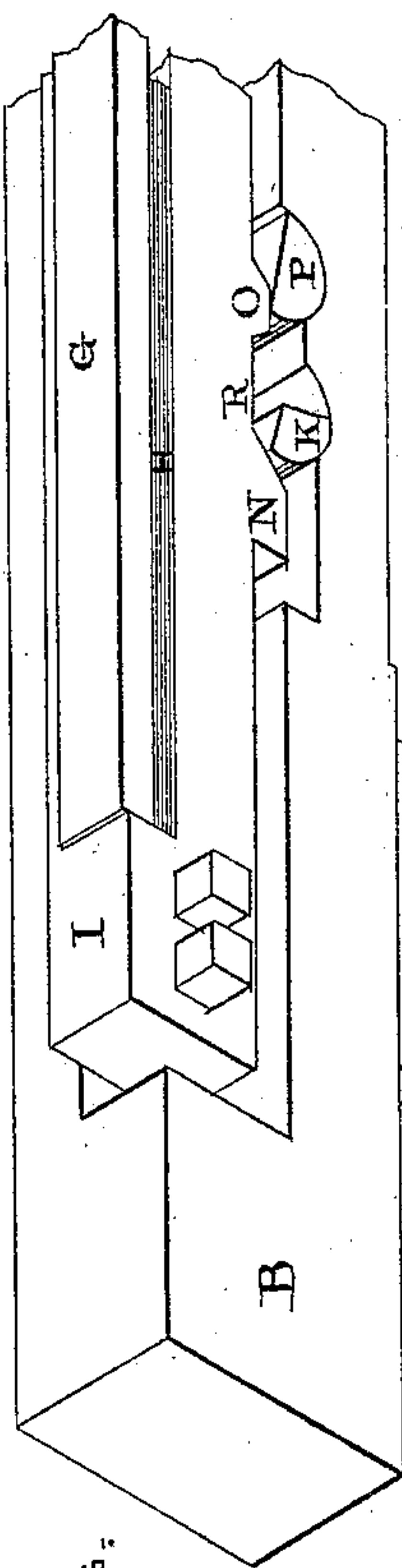


FIG. 3.

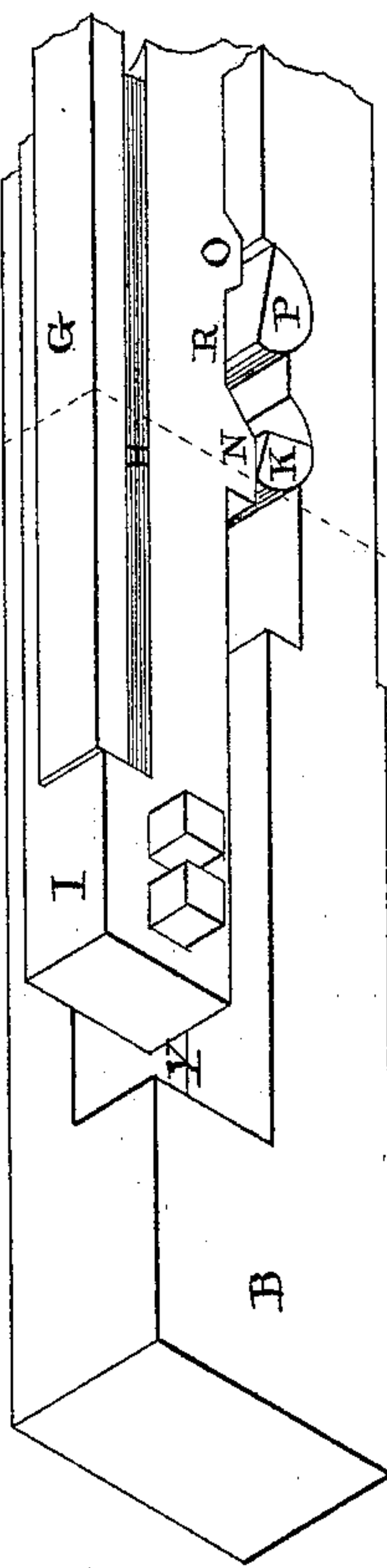


FIG. 4.

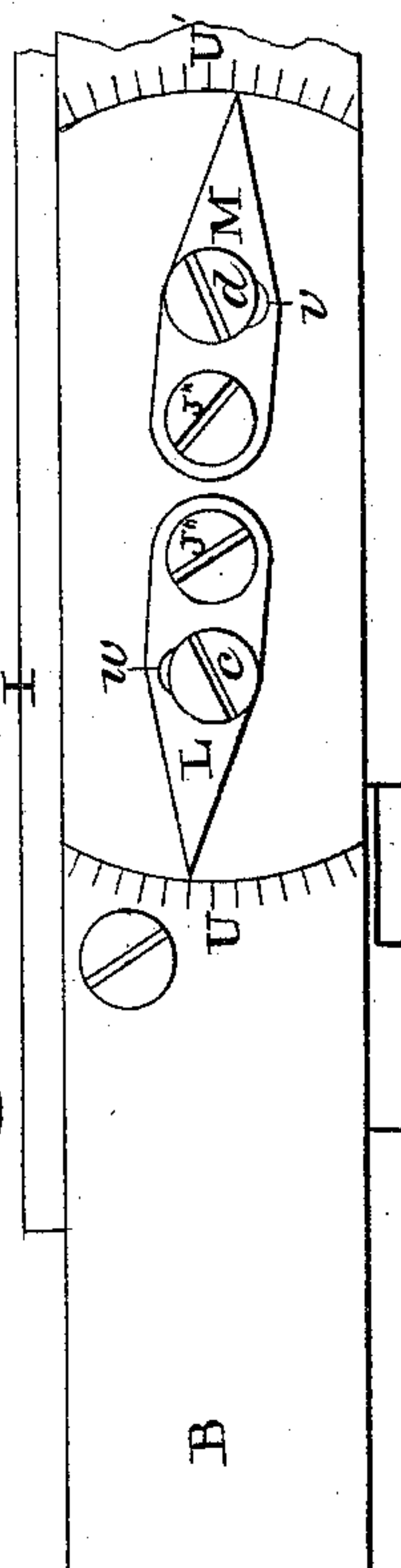


FIG. 5.

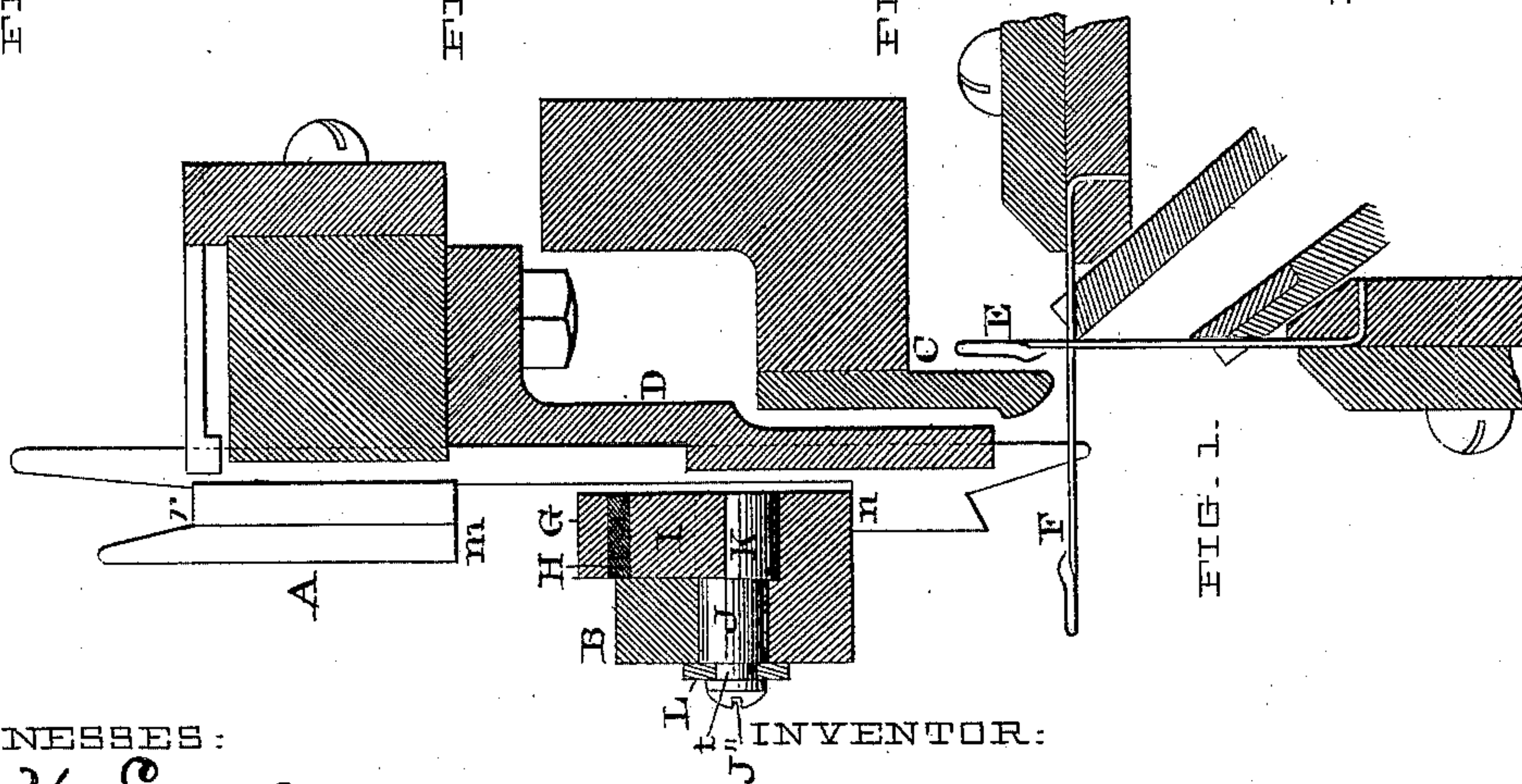


FIG. 1.

WITNESSES:

Geo W Essex
J. W. Olin

INVENTOR:

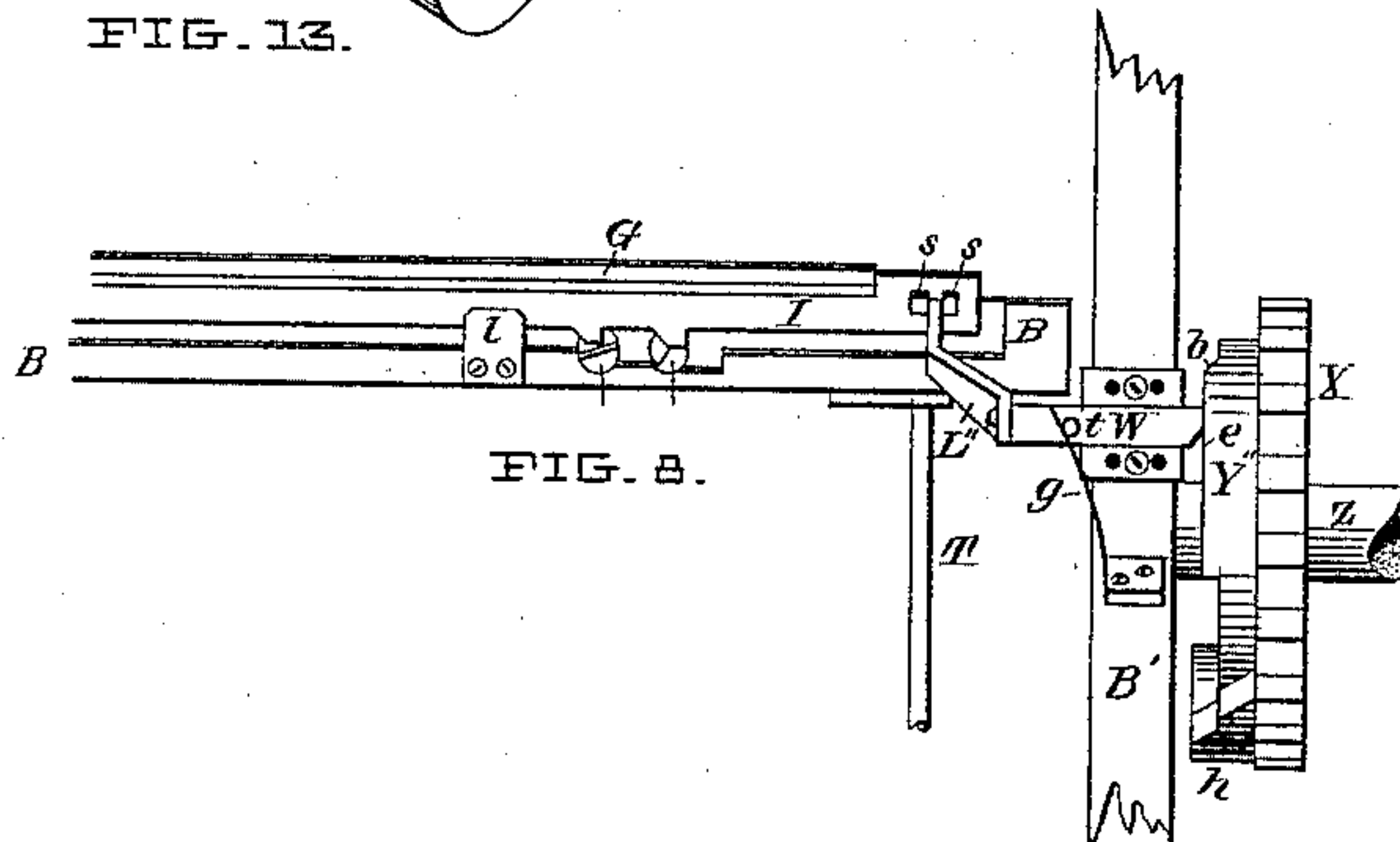
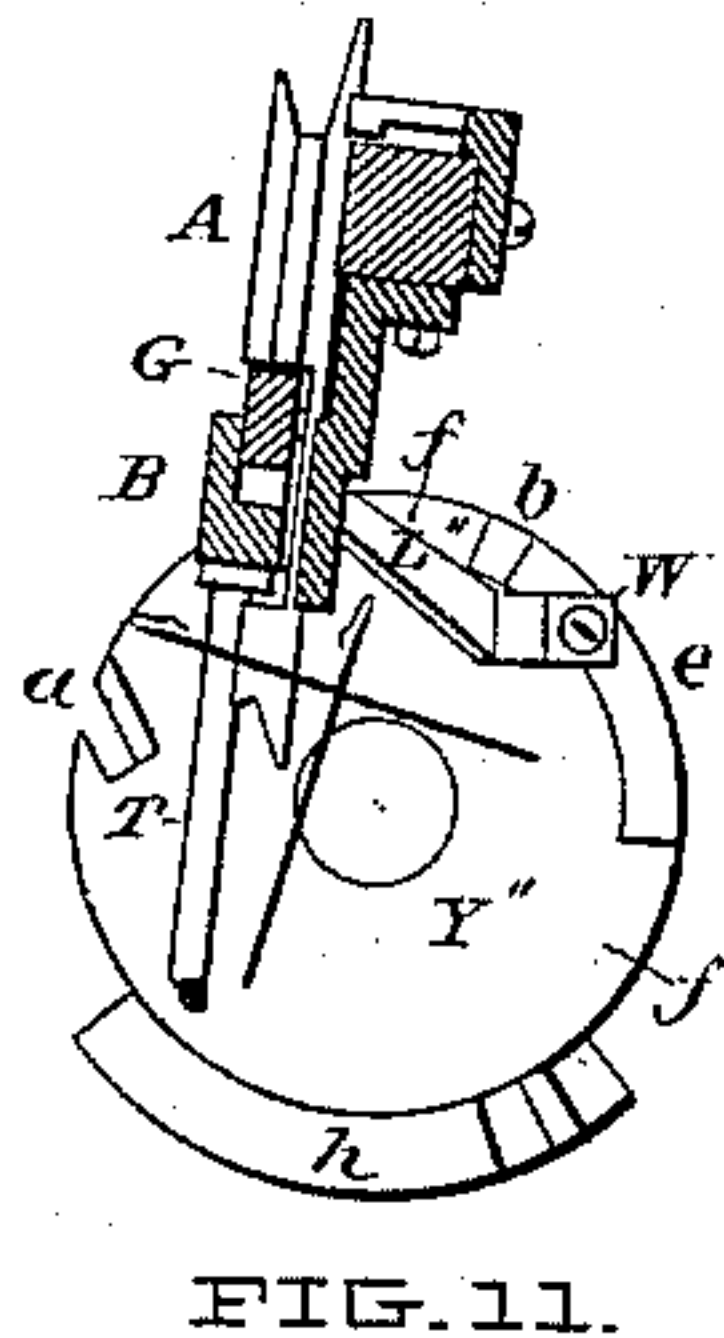
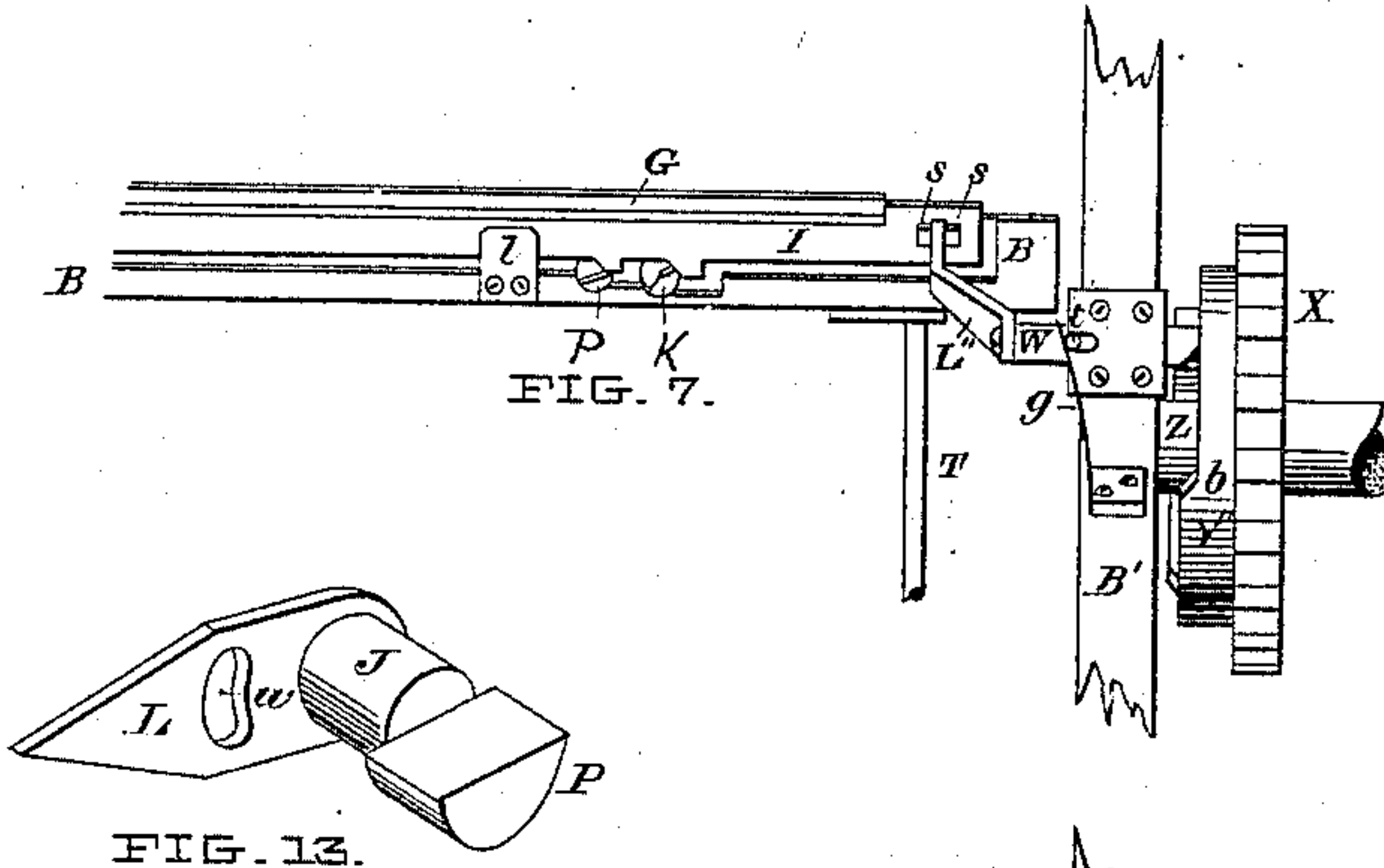
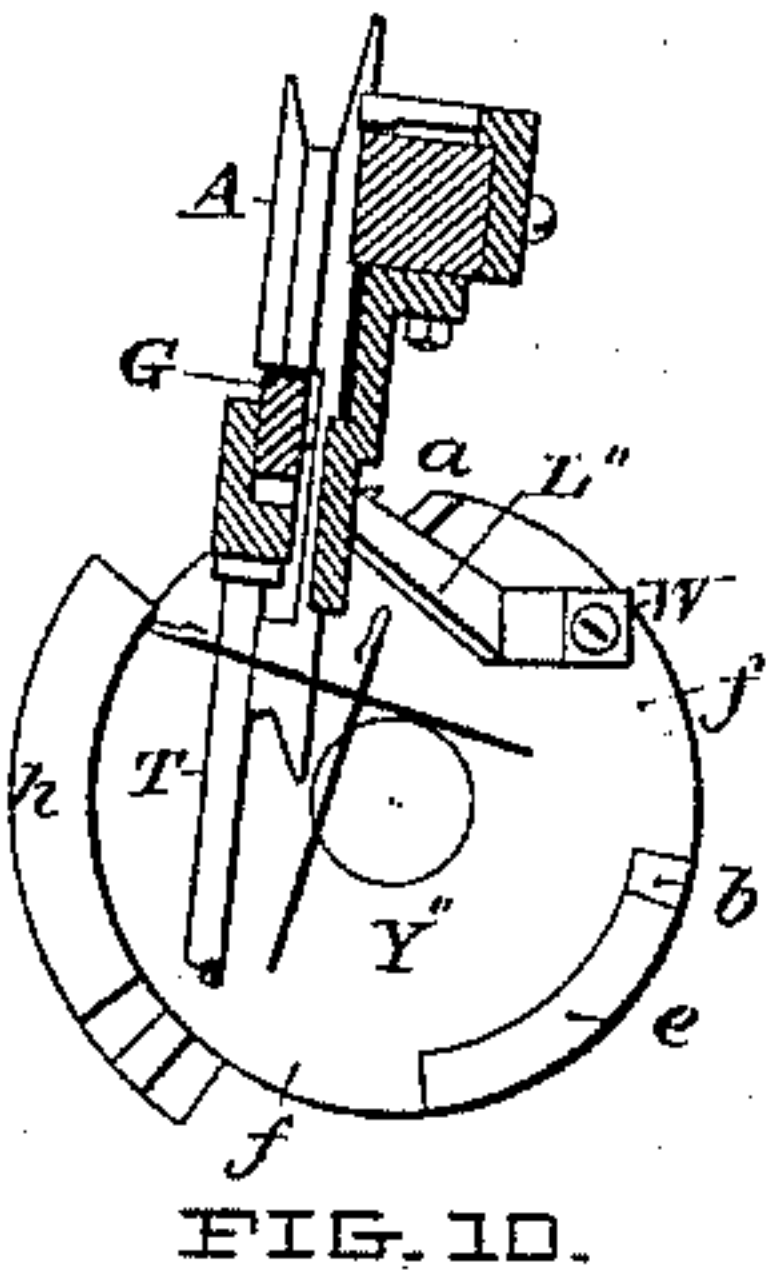
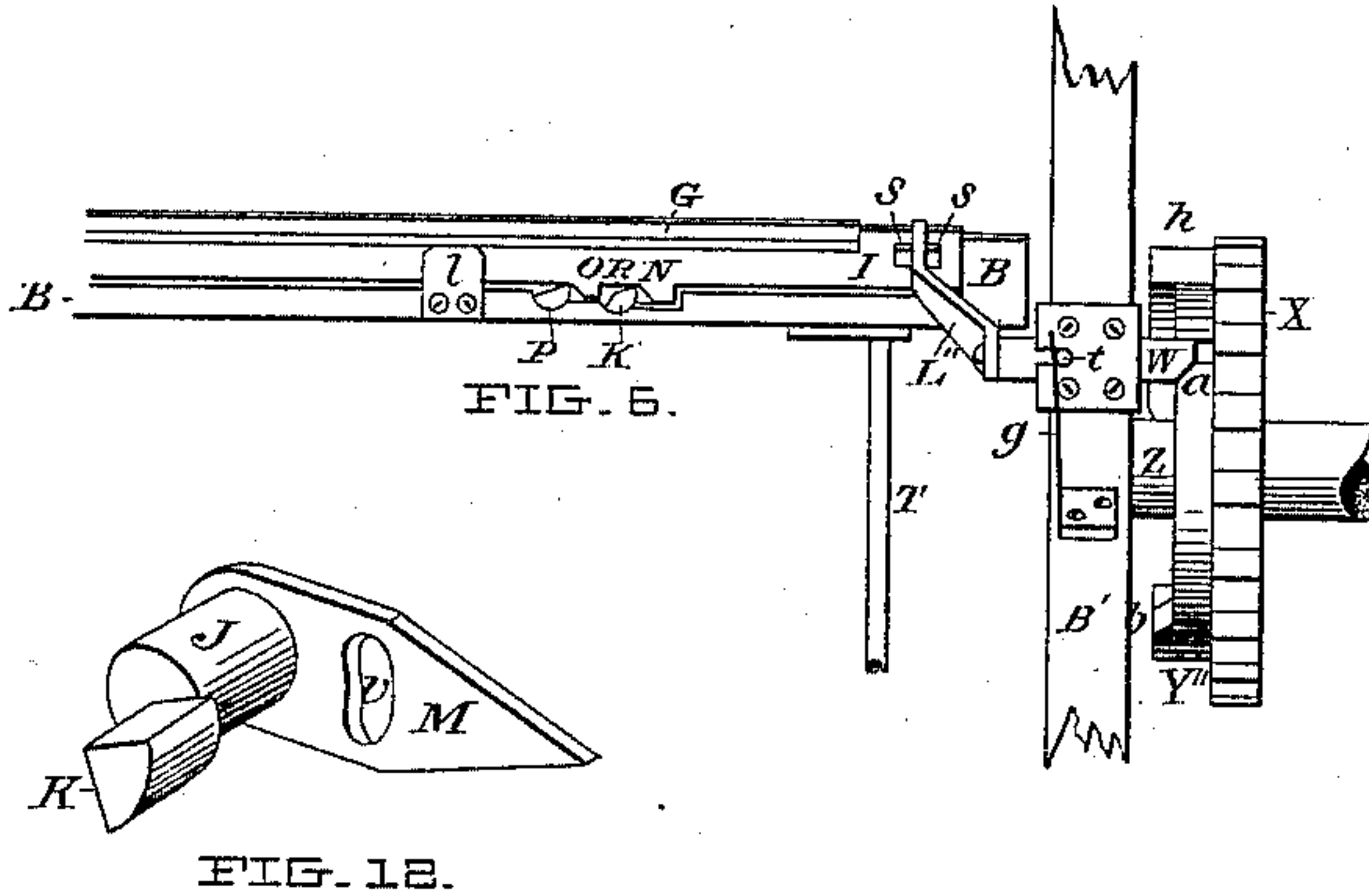
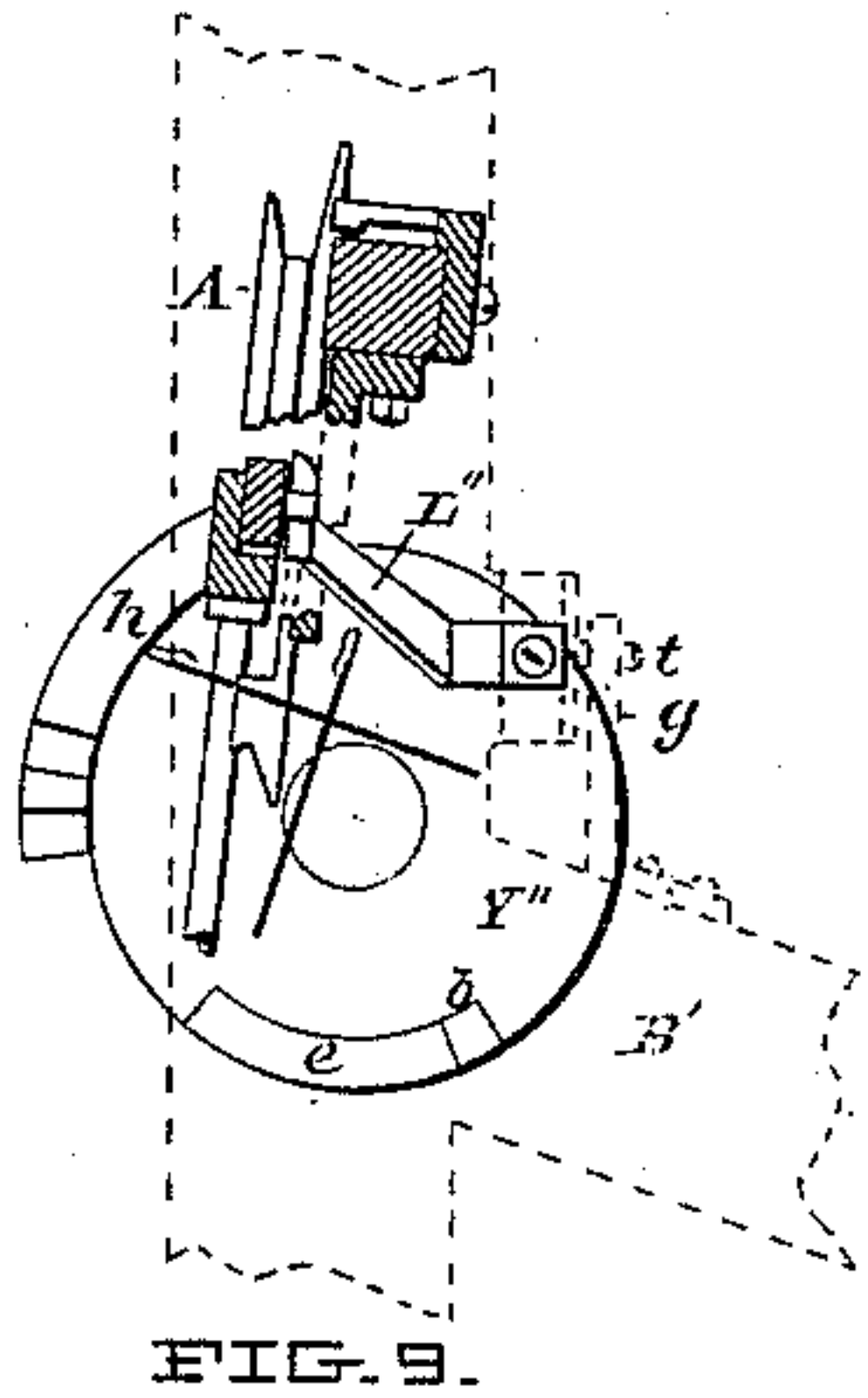
ELI TIFFANY.

By Franklin Scott, Atty.

(No Model.)

2 Sheets—Sheet 2.

E. TIFFANY.
FALLING BAR FOR STRAIGHT KNITTING MACHINES.
No. 408,363. Patented Aug. 6, 1889.



WITNESSES:

J. M. A. Cloward
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INVENTOR:

ELI TIFFANY,
BY *Franklin Scott*, ATTORNEY.

UNITED STATES PATENT OFFICE.

ELI TIFFANY, OF BENNINGTON, VERMONT.

FALLING BAR FOR STRAIGHT-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 408,363, dated August 6, 1889.

Application filed February 1, 1887. Serial No. 226,149. (No model.)

To all whom it may concern:

Be it known that I, ELI TIFFANY, of the town of Bennington, in the county of Bennington and State of Vermont, have invented certain Improvements in Falling Bars for Straight-Knitting Machines, of which the following description, in connection with the accompanying single sheet of drawings, constitutes a specification.

This invention relates to improvements whereby the width of falling bars used in flat-rib-knitting machines may be automatically increased or diminished in knitting ribs, welts, or slack courses, and to means for effecting such automatic movements; also, to appliances connected with the falling bar for adjusting the degree of separation of its parallel parts.

The invention is fully disclosed in the drawings, wherein I show, in—

Figure 1, a vertical transverse section through the sinker-bar, presser-bar, falling bar, and needle-bars of a machine, taken opposite or on the line 1 2 of Fig. 4. Figs. 2, 3, and 4 are perspective views of the back side of one end of the falling bar as adjusted in knitting slack courses, ribs, and welts, respectively. Fig. 5 is a face view of one end of the falling bar, showing the indicators and graduation connected with the adjusting-keys. Figs. 6, 7, and 8 are rear views of the falling bar, showing the actuating connections between itself and the rotary cam by which it is operated. Figs. 9, 10, and 11 are transverse sectional elevations of the driving-cam and falling bar, taken from Figs. 6, 7, and 8, respectively. Figs. 12 and 13 are perspective views of the two kinds of adjusting-keys employed to regulate the degree of separation of the two principal parts of the falling bar.

My improved falling bar consists, essentially, of the two bars B and I. Bar B may be termed the "main" bar, and the bar I the "impact" bar. These two bars, by devices hereinafter specified, have a separable adjustment, so that the included distance between the top of bar I and the bottom of bar B may be increased or diminished as the various lengths of stitch for welt, slack course, or plain web may require.

The impact-bar I is constructed in three

parts—viz., the stock I, the cushion-plate G, and the cushion H. It has a limited longitudinal movement upon bar B in its recessed seat Y, which is imparted to it by means of a dog L', Fig. 8, which is attached to slide W. Slide W moves in a way provided for it on the standard B' of the machine. This slide in turn is acted on by the rotary cam Y'', which is provided with cam-faces of different degrees of elevation for the purpose of moving the bar I variable distances. The dog L' engages with bar I by means of two pins s s.

On the under side of bar I are situated two cam-ledges N and O, the bottom surfaces of which lie in different horizontal planes. These bottom surfaces of cam-ledges N and O are fitted to ride on or off the upper sides of the adjusting-keys K and P, and according as one or the other or neither of said cam-ledges is or is not in contact with one or the other of the adjusting-keys K or P so is the bar I separated more or less remotely from the main bar B, and the cushion-plate G more or less elevated during the depression of the sinkers by the slur-cock. These keys are shown in Figs. 1, 12, and 13, and have each a cylindrical shank J, to which the index-pointer L or M is fitted and secured by the screw J'', as shown. One end of the key K is cut away, so as to exhibit substantially the shape seen in Fig. 12, and the other key has the shape shown in Fig. 13. When the keys are in position, they may be turned so as to bring the upper corner of the inner portion thereof into proper relation with one or the other of cam-ledges N or O. When so adjusted, they are secured in position by the set-screws c and d, which pass through transverse elongated slots v and w of the indicators L and M, which register their respective positions on the graduated arcs U and U'. The key K controls the adjustment of the parts with reference to the length of stitches in making welts, and key P controls the length of stitches in knitting the body part of the rib between the welt and the slack course, as well as the length of the stitches in the slack course. By means of these two ledges N and O and the independently-acting keys K and P, which co-operate with them, adjustments for length of stitch in the main web and in the welt may each be

made independently of the others—that is to say, by setting up key P so as to diminish the length of stitch for the web the length of stitch for the welt will not be disturbed, and so when the key K is turned so as to lengthen or shorten the welt-stitch the web-stitch will not be affected. This feature of independent adjustment of length of stitch in welt and web stitches constitutes a valuable feature of this invention. It is designed that a pair of these keys shall be provided for each section in the knitting-machine, so that special adjustment may be made, if necessary, for each web. In this way the impact-bar is evenly supported at any degree of separation from the main bar desired.

The sinkers shown in Fig. 1 are recessed from m to n , so as to form a square shoulder at these points. As the slur-cock traverses the successive sinkers through gap r they are severally forced down thereby until the shoulder m strikes the top surface of the cushion-bar G. This last-named bar rests on an elastic cushion H, consisting of leather or other elastic material, which is thus interposed between plate G and bar I to relieve the shock of the impact resultant from the sinkers being forced down against it, as above described.

The operation of the invention is as follows: A piece of fabric having first been run onto the needles as a starting or foundation piece, the machine is run until the dog L', working between lugs s s , impelled by cam-ledge b e , throws bar I to its extreme limit of throw and into the position shown in Figs. 4 and 8. In this position the lug rests upon the upper corner of and in contact with key K, thus raising the cushion-bar G to its greatest altitude. In this position sinkers A can have the least downward movement, and as a consequence the shortest possible stitch is made on the needles F. This is especially desirable in a welt, which should be knit firmly and closely. When the welt has been formed and cast off, (which is done in the usual way,) bar I is slipped longitudinally by the dog aforesaid under the influence of spring g working against pin t of slide W, so that lug O shall descend into contact with the upper corner of key P, as seen in Fig. 3. While the parts stand in this position the main or body portion of the rib or cuff is knit in the usual way. When this is accomplished, the impact-bar receives another jog by the said dog by reason of spring g having forced slide W into the gap a of the cam-wheel Y, which movement forces bar I still farther in the same direction, so that lug O slides off key P, and bar I descends to the lowest position, as seen in Fig. 2, or so that the body R of the bar I rests on key K. In this situation the

slack course is knit, after which the bar is returned to the position shown in Fig. 3, when a very limited number of courses are knit prior to setting the bar again for a welt, as in Fig. 4.

As the appropriate sliding movements of bar I upon bar B may be obtained with any appropriate mechanism and in any appropriate way, I do not here claim any specific means for effecting such movements.

The back supporting-bar D for the sinkers A, and the spring-bar and springs shown, which support the sinkers when elevated, constitute the subject-matter of another application bearing the Serial No. 226,148, filed February 1, 1887, and are therefore not described or claimed herein.

This invention is adapted for use in connection with flat-rib-knitting machines like that patented May 1, 1860, No. 28,133, to Eli Tiffany.

I therefore claim as my invention—

1. A falling bar for straight-knitting machines, composed of a main bar, a parallel longitudinally-sliding impact-bar provided with two or more sets of cam-ledges disposed on different horizontal planes, and rotatably-adjustable keys connected with the main bar, said keys being each provided with an index-finger, which is adapted to register the position of the key on a scale on the face of the main bar, substantially as described, and for the purpose set forth.

2. The combination, with the main bar, of the longitudinally-sliding impact-bar provided with contact-ledges, and the interposed adjusting-keys fitted to co-operate independently with said contact-ledges as a means for regulating the lengths of the web and welt stitches independently of each other, substantially as described and set forth.

3. The combination of a series of sinkers A, having shoulders m and n , with a falling bar composed of two parallel pieces, the upper one of which is vertically adjustable with reference to the under one by means of cam-ledges on the under side of the upper bar, and lugs or keys on the lower bar, substantially as shown, and means connected with the upper bar, substantially as shown, for imparting to it an endwise movement to force the cam-ledges up onto the tops of the keys or lugs aforesaid, substantially in the manner described, and for the purposes set forth.

In testimony whereof I have hereto subscribed my name, at Bennington, Vermont, this 10th day of January, A. D. 1887.

ELI TIFFANY.

In presence of—

FRANKLIN SCOTT,
F. W. OLIN.