

(No Model.)

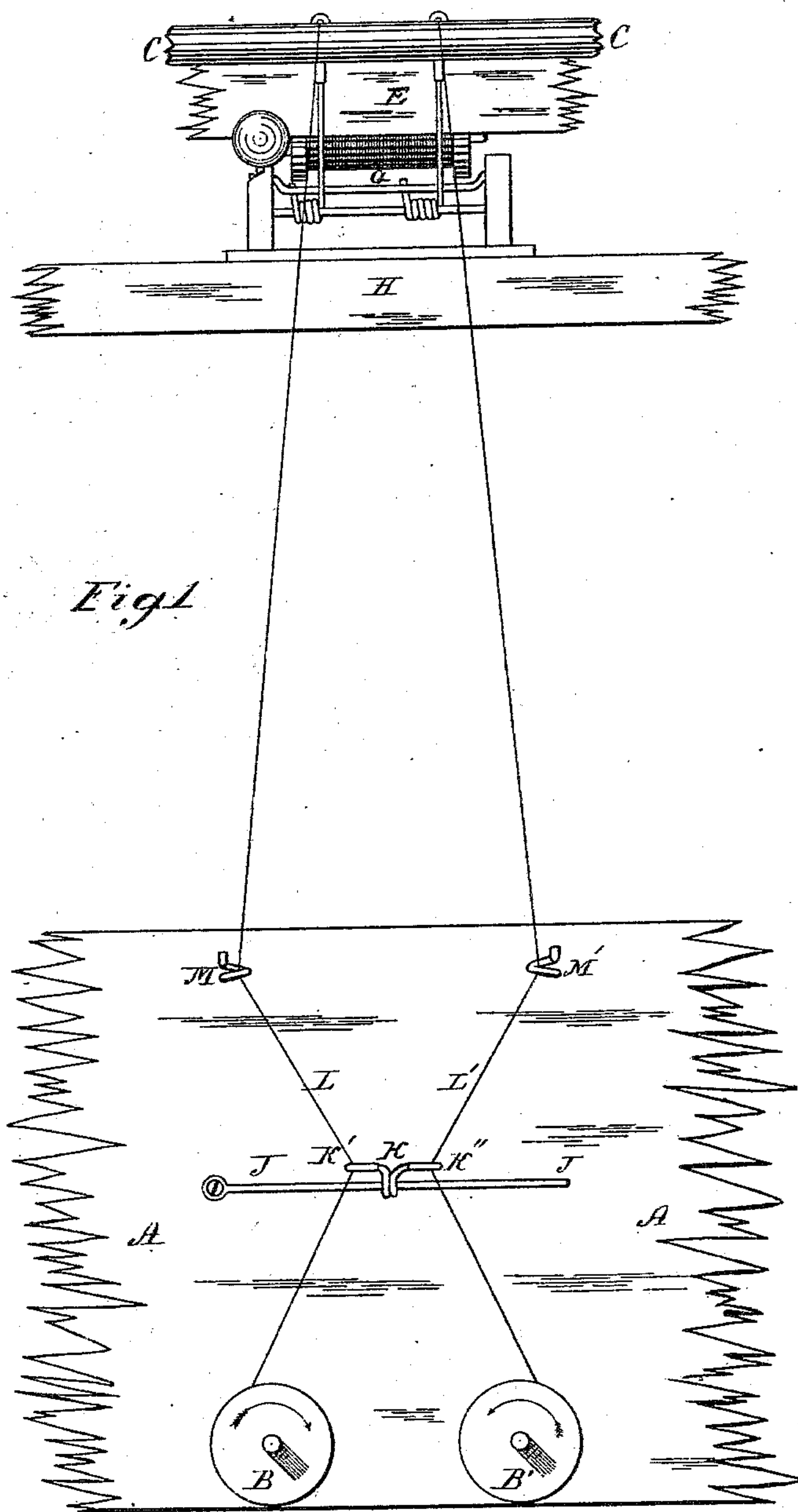
3 Sheets—Sheet 1.

J. M. GRANT.

TENSION EQUALIZER FOR THREAD DOUBLING MACHINES.

No. 283,599.

Patented Aug. 21, 1883.



Witnesses.

Edw. F. Dimock.
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(No Model.)

3 Sheets—Sheet 2.

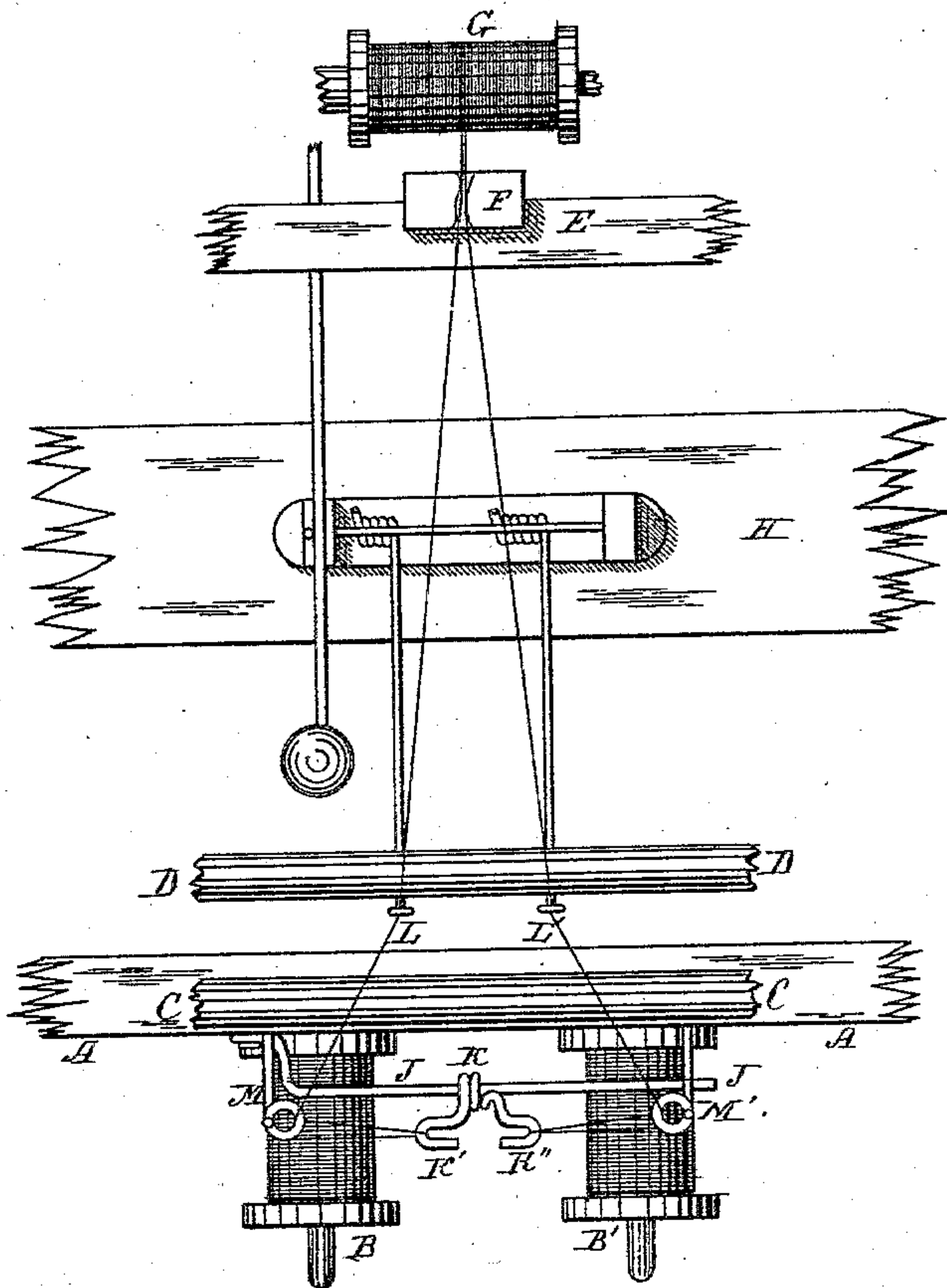
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Fig. 2.



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3 Sheets—Sheet 3.

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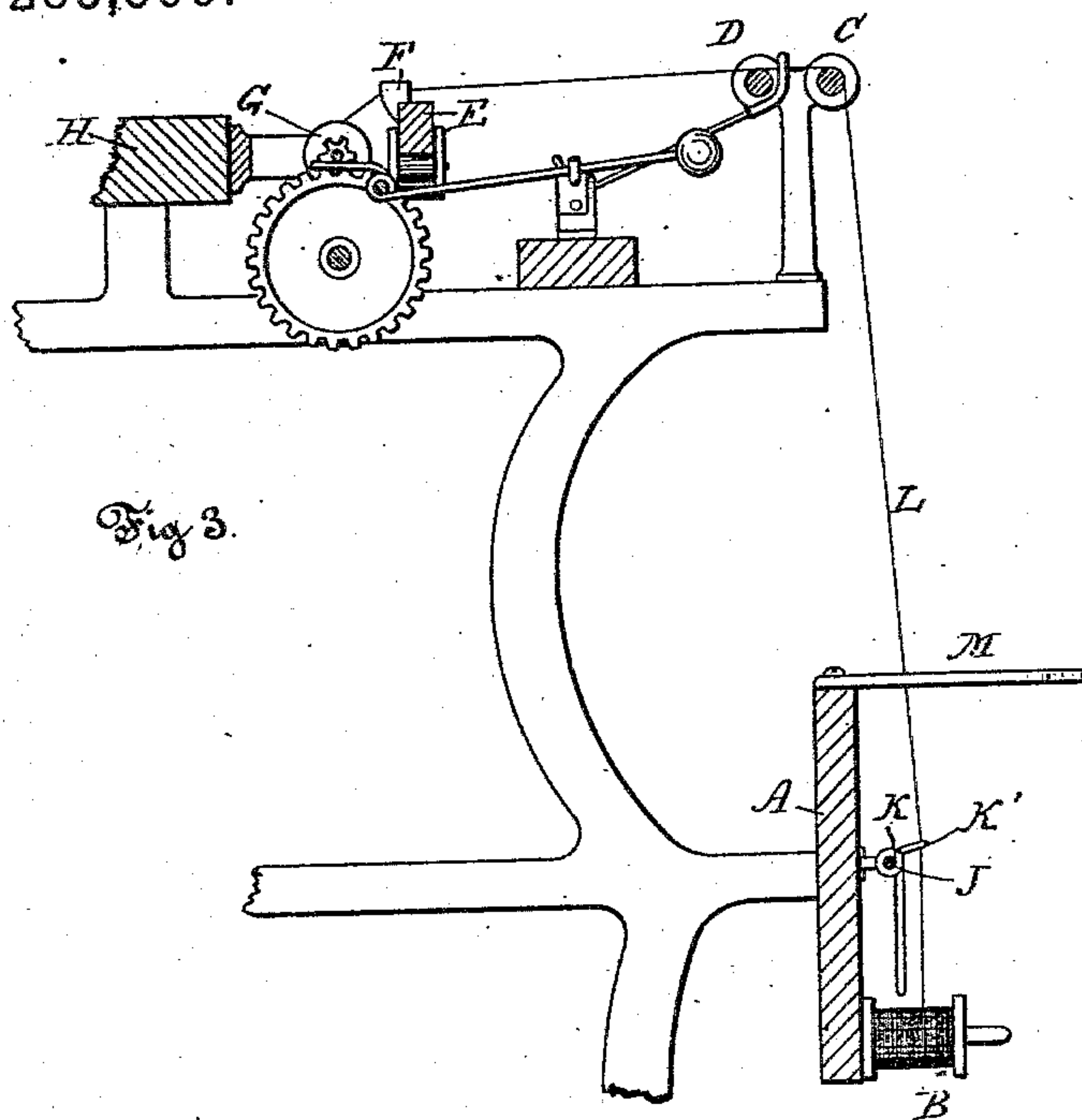


Fig 3.

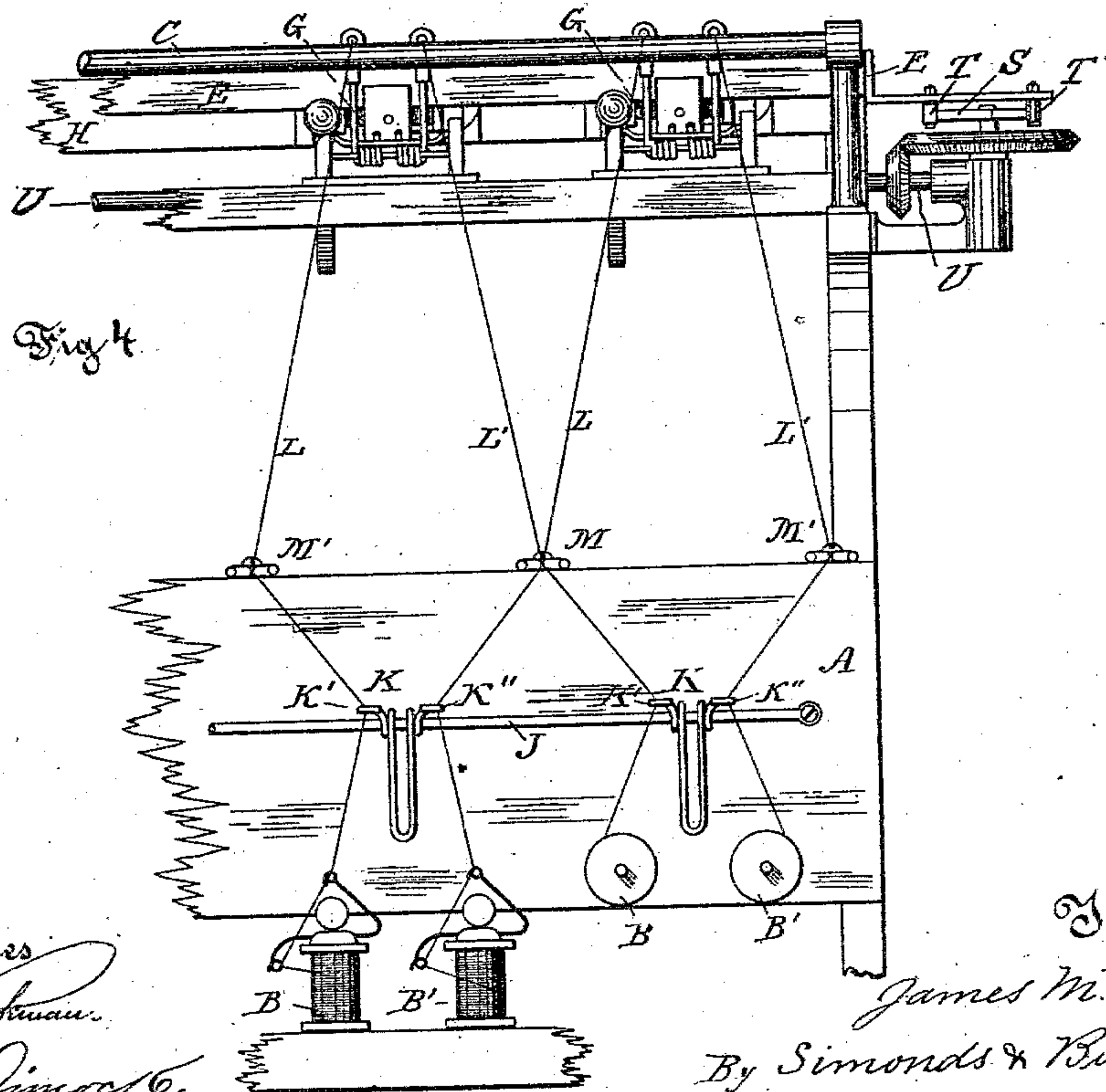


Fig 4.

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UNITED STATES PATENT OFFICE.

JAMES M. GRANT, OF HARTFORD, CONNECTICUT.

TENSION-EQUALIZER FOR THREAD-DOUBLING MACHINES.

SPECIFICATION forming part of Letters Patent No. 283,599, dated August 21, 1883.

Application filed September 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. GRANT, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tension-Equalizers for Thread-Doubling Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My improvement relates to machines which are used for doubling silk or other threads by winding two strands off from the respective bobbins upon which they are wound and uniting them by winding them together upon a single bobbin. In this doubling it is very desirable to have the two strands wound at exactly the same degree of tension, so that when united they shall form a perfectly even and uniform thread.

The object of my invention is to provide a simpler and more perfectly operating mechanism than has heretofore been in use for this purpose.

In the accompanying drawings, on two sheets, illustrating my invention, Figure 1 is a front view of part of a doubling-machine embodying my improvement. Fig. 2 is a top view of the same. Fig. 3 is a view in vertical cross-section of a doubling-frame of ordinary form, showing in side view details of my improvement and of the common automatic stop device. Fig. 4 is a front view of the same frame near one end, showing my device in front view, two single threads being drawn from bobbins on horizontal spindles and two others from bobbins on vertical spindles using fliers.

A is a part of the fixed frame of the machine, which carries the spindles for the bobbins from which the two strands are drawn which it is desired to double.

B and B' are the bobbins from which the strands are taken.

C and D are guide-rods, over which the threads run to determine their proper direction. These may be made of metal or glass.

E is a bar adapted to slide longitudinally, and fast to one end of it are the downward-

projecting studs bearing friction-rollers T T', which bear against opposite points on the periphery of the rotary cam-disk S, secured eccentrically upon the upright journal of one of the system of gears driven by the shaft U as it rotates. This bar is provided with a guide or block, F, through which the two strands pass to be united into one upon the bobbin G. As the bar E moves back and forth it distributes the thread upon the bobbin. The bobbin G is driven by gearing and draws the thread off from the delivering-bobbins B and B'.

H is a part of the fixed frame of the machine, which supports the mechanism for stopping the receiving-bobbin G whenever a thread or strand breaks. This mechanism is not essential to my invention and need not be described, but is clearly shown in Figs. 3 and 4. The parts of the machine above described are of any ordinary construction, and are commonly arranged along the frame of the machine, which may consist of any desired number.

J is a small metallic rod placed a short distance in front of and parallel to the part A of the frame. It is shown in the drawings attached at one end to the frame A, and it may be extended along the whole machine, so as to serve for many pairs of threads, or it may be separate for each pair.

K is the equalizer, or device for regulating the tension. It slides on the rod J, and is furnished with hooks or loops at its ends, (shown at K' and K'' in the drawings,) through which the two strands L and L' pass. This equalizer K is provided with an eye, through which the rod J passes loosely, so that it can easily slide back and forth upon the rod.

M and M' are guides upon the frame A, through which the strands pass upward to the receiving-bobbin. They are made of wire in the customary twisted form, so that the strands or threads can be hooked into them; or they may be made in the form shown in Figs. 3 and 4.

The two strands L and L', whose tension is to be equalized before they unite into one thread, pass from the bobbins B and B', which are placed loosely upon their spindles, inwardly to the hooks K' K'', and then again diverge to pass through the eyes M M' above. The two strands are thus drawn inwardly at an angle, so that they are nearer together at the equalizer than at the bobbins or eyes. This

deflection causes a certain amount of friction at the points where the strand passes over the equalizer and guide, which is greater the more the strand is deflected. The equalizing of the
5 tension of the two strands as they are drawn upward by the receiving-bobbin G is therefore thus effected. If one of the bobbins from which the thread is drawn—as B, for instance—
10 offers a greater resistance, either from running harder on its spindle or having less thread upon it, it at once tightens the strand L, and this draws the equalizer K immediately to that side, thereby allowing the strand L to straighten and cause less friction in the hook K' and
15 the guide M, thus balancing the increased resistance at the bobbin B. If the tension upon the two strands is the same, the equalizer will remain in the middle, deflecting them alike; but as soon as the tension upon one strand becomes
20 in the least degree greater than the other the equalizer moves to that side and relieves it. In this way the two strands pass on to the receiving-bobbin G under the same de-

gree of tension and form a uniform and smooth thread.

In the drawings the equalizer K is shown as being formed from wire bent into the proper form. It may, however, be made of glass or any other suitable material.

I claim as my invention—

1. The combination, with the frame of the machine and the rod J, arranged thereon as described, of the equalizer K, adapted to slide upon said rod, all substantially as described, and for the purpose set forth.

2. The combination, with the frame of the machine, the bobbin-supports, and mechanism for drawing off and winding up the doubled thread, of the fixed rod J, the equalizer K, adapted to slide thereon, and the fixed guides
40 M M', all substantially as described.

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Witnesses:

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