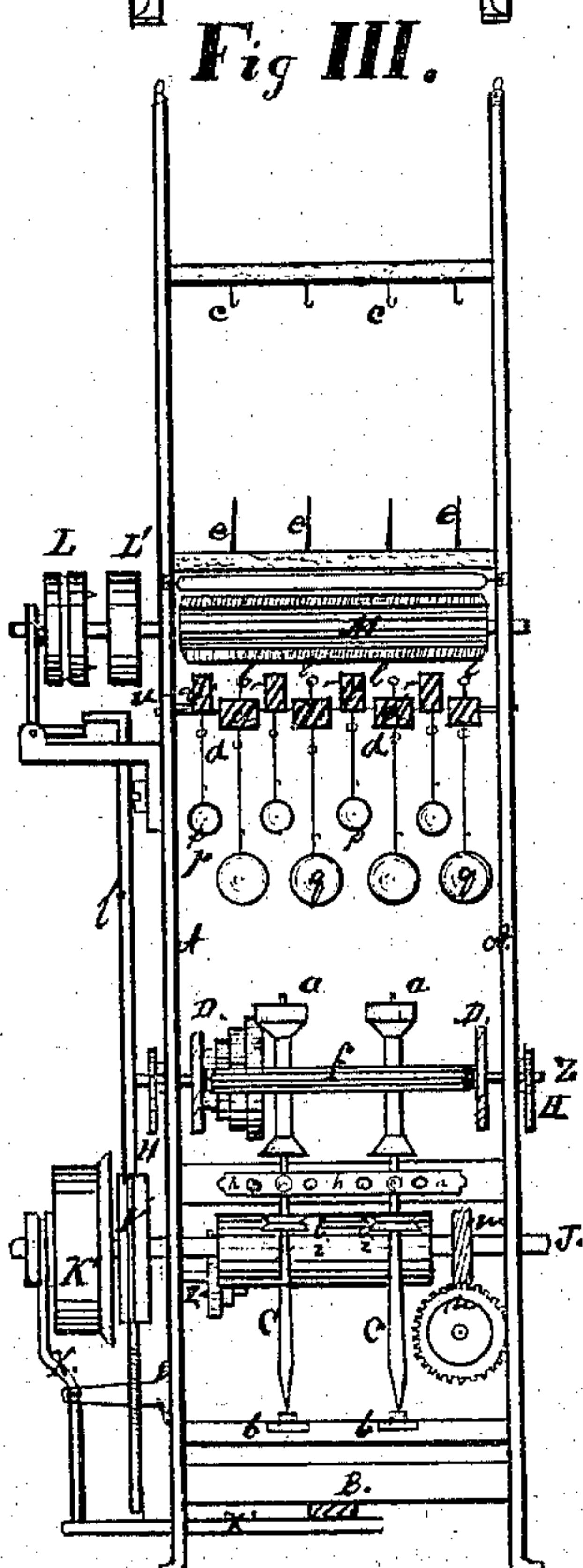
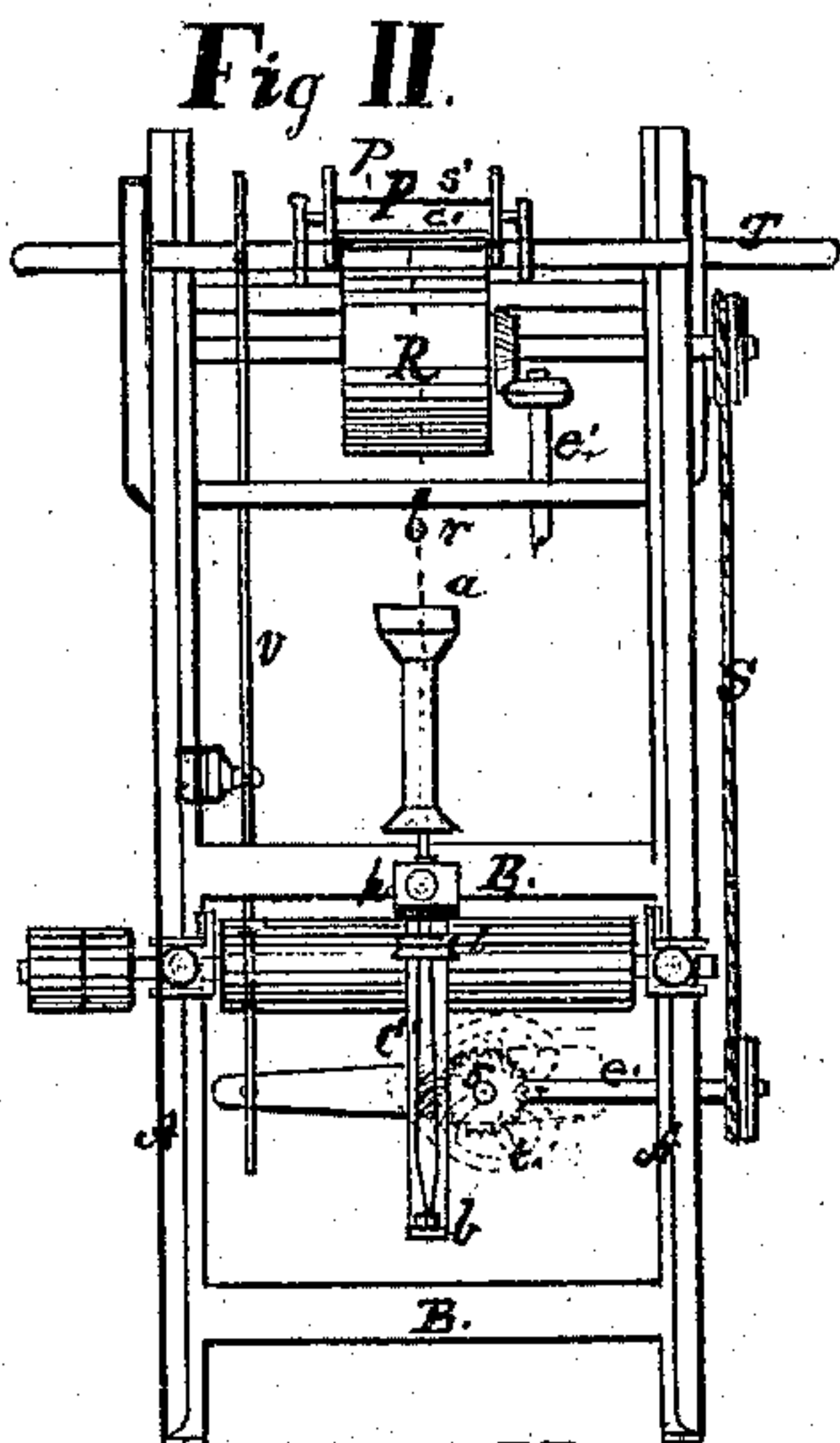


F. H. PERRY.
Improvement in Machines for Doubling and Twisting Yarn.
No. 125,688.

Patented April 16, 1872.



Witnesses.
C. H. Poole
Jas. Story

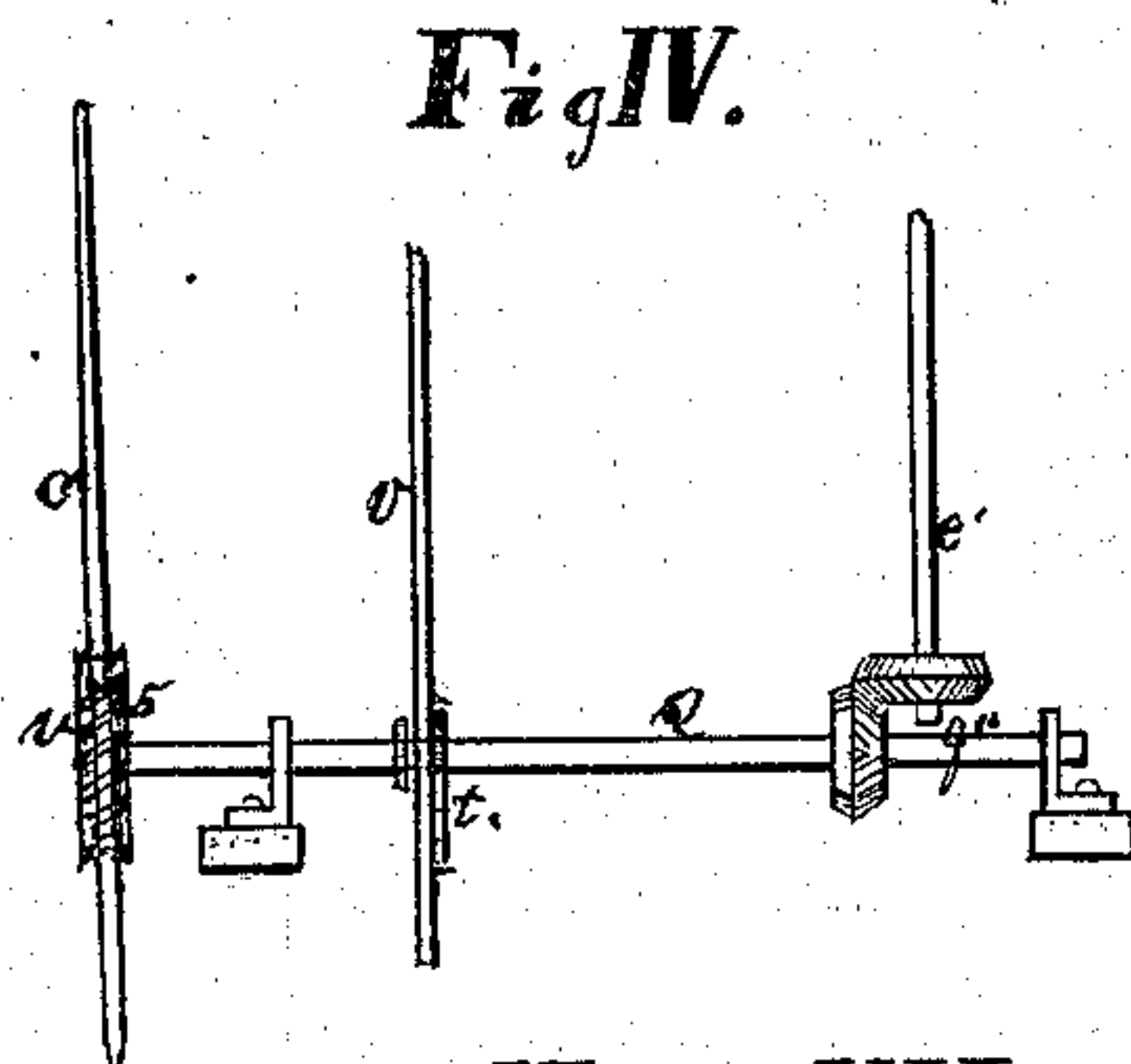
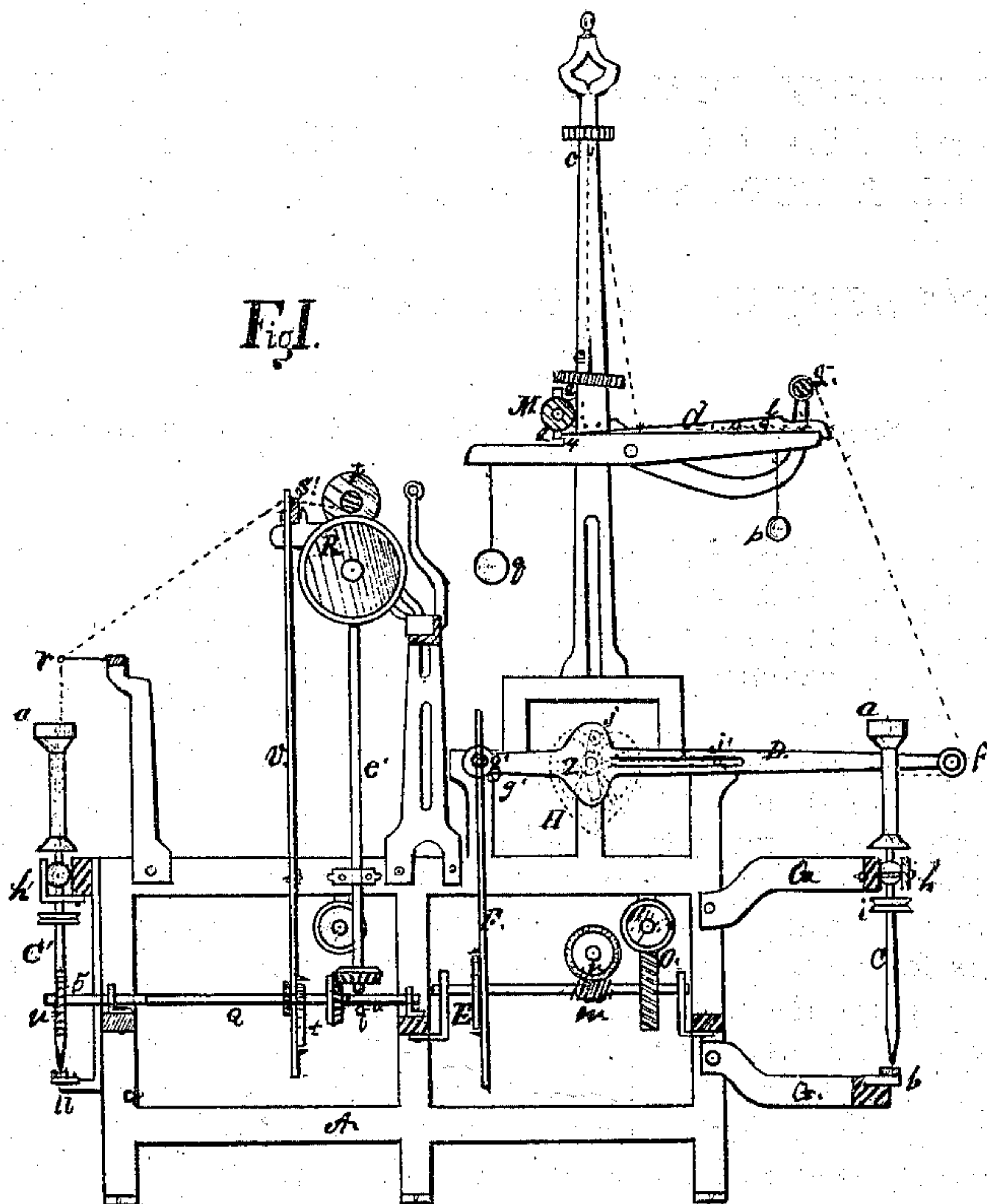


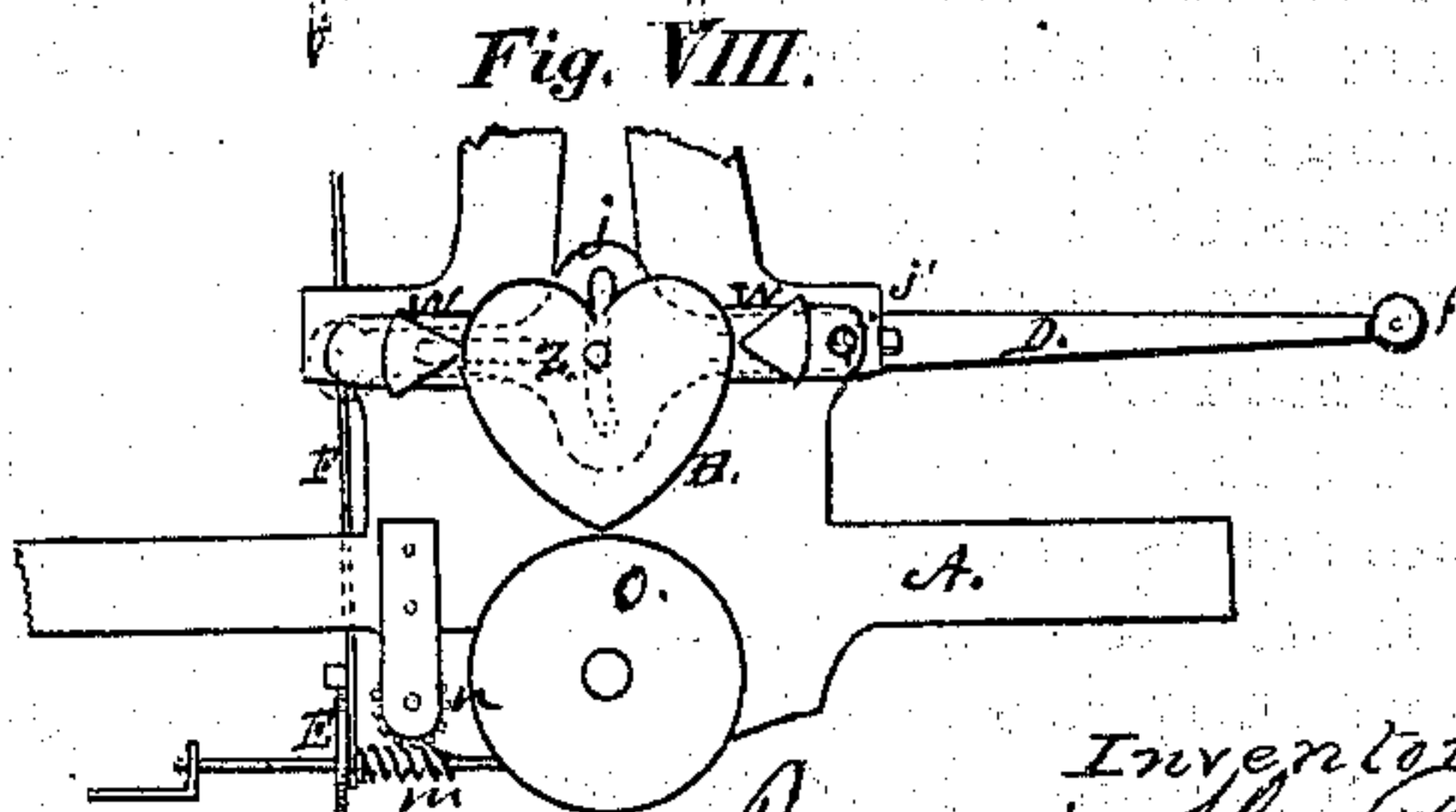
Fig V.



VI.



VII.



Inventor.
Francis H. Perry
By J. B. Woodruff, Attorney

UNITED STATES PATENT OFFICE.

FRANCIS HENRY PERRY, OF NIAGARA FALLS, NEW YORK, ASSIGNOR OF ONE-FOURTH HIS RIGHT TO HENRY S. WARE, HANS NIELSON, AND DANIEL J. TOWNSEND, OF SAME PLACE.

IMPROVEMENT IN MACHINES FOR DOUBLING AND TWISTING YARNS.

Specification forming part of Letters Patent No. 125,688, dated April 16, 1872.

Your petitioner, a resident of Niagara Falls, in the county of Niagara and State of New York, prays that Letters Patent may be granted to him for the invention set forth in the annexed specification.

My invention consists in certain improvements in the construction of mechanism for doubling and twisting any required number of threads, either plain or of various colors, and uniting them in one, to form plain or variegated yarns for manufacturing purposes.

Figure 1 represents an end sectional view of my improved machine, the right-hand portion showing the doubling and the left hand the twisting mechanism. Fig. 2 shows a front view of the twisting mechanism. Fig. 3 shows an elevated view of the doubling mechanism. Fig. 4 is a broken-off view of the detached parts of the twisting portion of the machine. Figs. 5, 6, 7 show the ball-spindle bearings as they may be secured by different kinds of clamps. Fig. 8 shows an enlarged side view of the heart-cam and vibrating and sliding arm mechanism for guiding the doubled yarn on the bobbins uniformly preparatory to its being twisted.

To enable others to make and use my improvements, I will give a more general description, referring to the drawing and the letters marked thereon.

The ends of the frame A A may be made of cast-iron, and the two are connected together by bars B B, of any desired length required for the number of spindles C C employed. The series of doubling spindles are arranged on a bracket-frame, G G, extending out from the frame A a convenient distance, and having their lower points in flexible steps *b b*, and are run in ball-bearings *h h*, just above the band-pulleys *i i*. The spools *a a* are placed on their upper ends to receive the yarn, after it is doubled, by the mechanism shown on the right of Fig. 1, and in a front view in Fig. 3. The twisting mechanism is shown on the left of Fig. 1, and in front view in Fig. 2, and will hereafter be more fully described.

The operation of doubling is as follows: Any desired number and variety of colors of the cops of single threads taken from the spinning-machine are placed upon the skewers *e e e*. The threads are passed up over the hooks *c c c*

and down to the equalizing-levers *d d d*, which are provided with eyes *l l l* and a series of bridge-wires, between which the thread passes up over the roller *g* and down to the guiding-roller *f* and on the bobbin *a* placed on the spindle C, where it is laid uniformly on the whole length of the bobbin by means of the mechanism provided for the purpose, which consists of the movable arms or levers D D, connected together by a bar, *g'*, and the rod *f*, so as to form a frame to work on a movable fulcrum, *j'*, on the frame *w*, and be moved up and down by the action of the heart-shaped cam E and a connecting rod, F, on the bar *g'* that connects the rear ends of the vibrating-levers D D, they being provided with a curved slot, *j*, through which the shaft *z* passes. On the ends of the said shaft *z* the large heart-cams H H are secured, to give the necessary endwise movement to the fulcrum-rod *j'* of the arms D D, so that, beginning with a short vibration, the cams H will gradually draw back the fulcrum-rod *j'*, lengthening the vibration of the free end of the arms D as the layers of yarn on the bobbin approach the extremities of the heads, and then gradually move it forward, thereby shortening the vibration until the fulcrum-rod *j'* has returned again to its starting-point. The build is varied by changing the band on the cone-pulleys—one on the shaft *z* and the other on the shaft *z'*—the latter being driven from the shaft J by the endless screw *m* and worm-gear *n*, put in motion by the gear *o*, driven by the worm on the main driving-shaft J. This shaft J is provided with a friction-pulley, K, which is put in gear with the belt-pulley K' by the clutch-lever X, connected to a piece, X', and operated by the foot-piece underneath. The thread-tension levers *d d* and bridge-pieces *d' d'* are provided with weights *p* and *q*, and have shoulders 4 near their rear ends, which, on the breakage of a thread, serve to stop the rotation of the cylinder M, and the machine, by rising against one of the wings 2 2 of said cylinder M, thus disengaging the pulleys L and L', and raising the vertical rod *l'* which holds the pulleys K and K' in contact.

The yarn having been doubled and uniformly placed on the bobbins *a a* by the mechanism above described, the bobbin is removed and

placed upon the spindle C' on the twisting side of the machine. The doubled yarns are passed up through the eye *r* and through an eye, *s'*, in the movable guide T, and thence to the spool P, which is rotated to take up the yarn as it is twisted by resting on the revolving cylinder R, which is put in motion by the band S, driven by a pulley on the horizontal shaft *e'*, the latter receiving motion through bevel-gears *q''* from the shaft Q, that is driven by the worm-gear *u* on the spindle C'; or a shaft and gears may be substituted for the band S. The horizontal sliding bar T, on which is the guide S' for carrying the yarn uniformly from end to end of the spool P, is operated by a vertical lever, *v*, and a heart-cam, *t*, on the horizontal shaft Q, which is also operated by the pinion 5 driven by the screw or worm *u* on the spindle C', whereby all of the movements work simultaneously, so that a positive and uniform twist of any size or quality of yarn may be obtained.

The spindles and other journals of the shafts, which are required to run at a high speed, are provided with spherical bearings *h*, they being secured in position by clasps *k*, as shown in Figs. 5, 6, and 7.

Having thus fully described my improvements in doubling and twisting machines, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The vibrating frame D D, the sliding frames *w w*, and heart-cams H H for changing the position of the fulcrum-rod *j'*, in combination with the heart-cam E, connecting-rod F, and the worms and worm-gears *m*, *n*, and *o*, for guiding the doubled yarns onto the bobbins *a a*, substantially as herein shown and described.

2. I claim the arrangement and combination of mechanism, consisting of the worm-gear *u* on the spindle C', the shaft Q, bevel-gear *q''*, pulleys and band S to rotate the cylinder R, and spool P to receive the twisted yarns, the cam *t*, vertical lever *v*, and sliding guide T, all operating together in the manner as and for the purposes herein set forth.

In testimony whereof I hereunto subscribe my name in presence of—

FRANCIS HENRY PERRY.

Witnesses:

LE ROY WILLIAMS,
SAMUEL SMITH: