(No Model.)

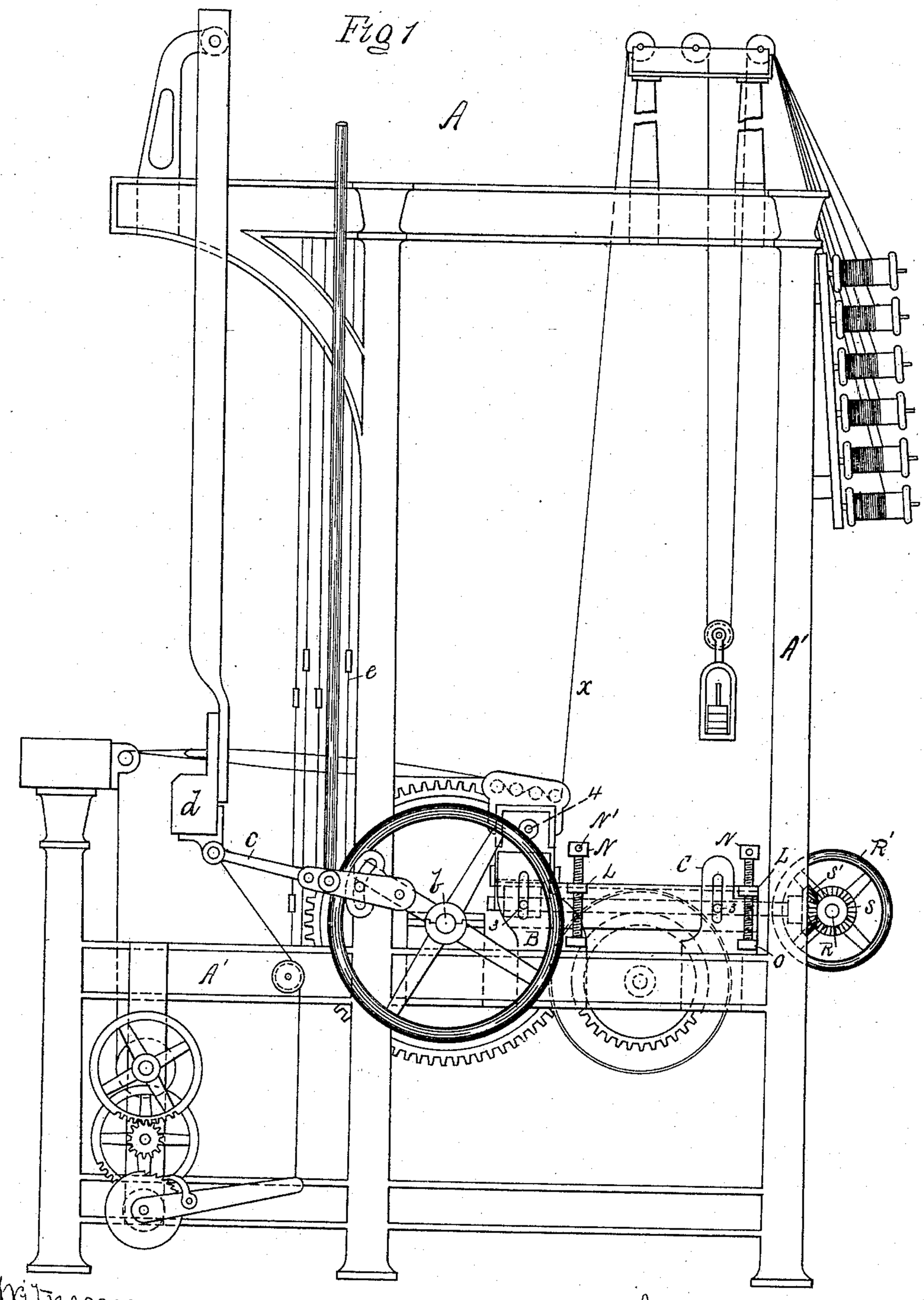
4 Sheets—Sheet 1.

JOHN NIGHTINGALE & JOSEPH NIGHTINGALE.

MECHANISM FOR FACILITATING TYING IN WARPS IN LOOMS.

No. 431,989. Patented July 8, 1890.

Fig 1



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(No Model.) 4 Sheets—Sheet 2.

JOHN NIGHTINGALE & JOSEPH NIGHTINGALE.

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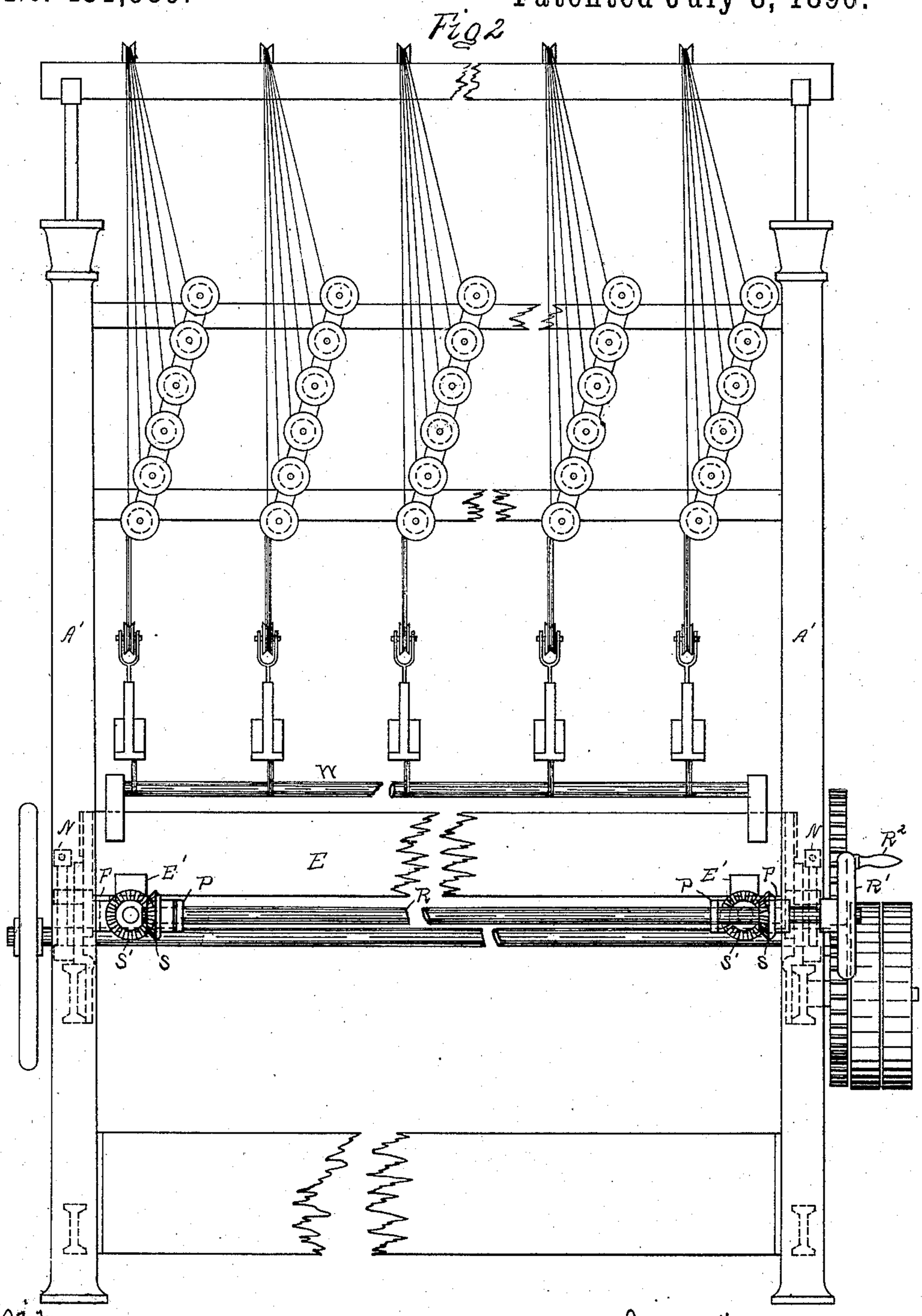
Fig 2



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(No Model.)

4 Sheets—Sheet 3.

JOHN NIGHTINGALE & JOSEPH NIGHTINGALE.

MECHANISM FOR FACILITATING TYING IN WARPS IN LOOMS.

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Fig 3

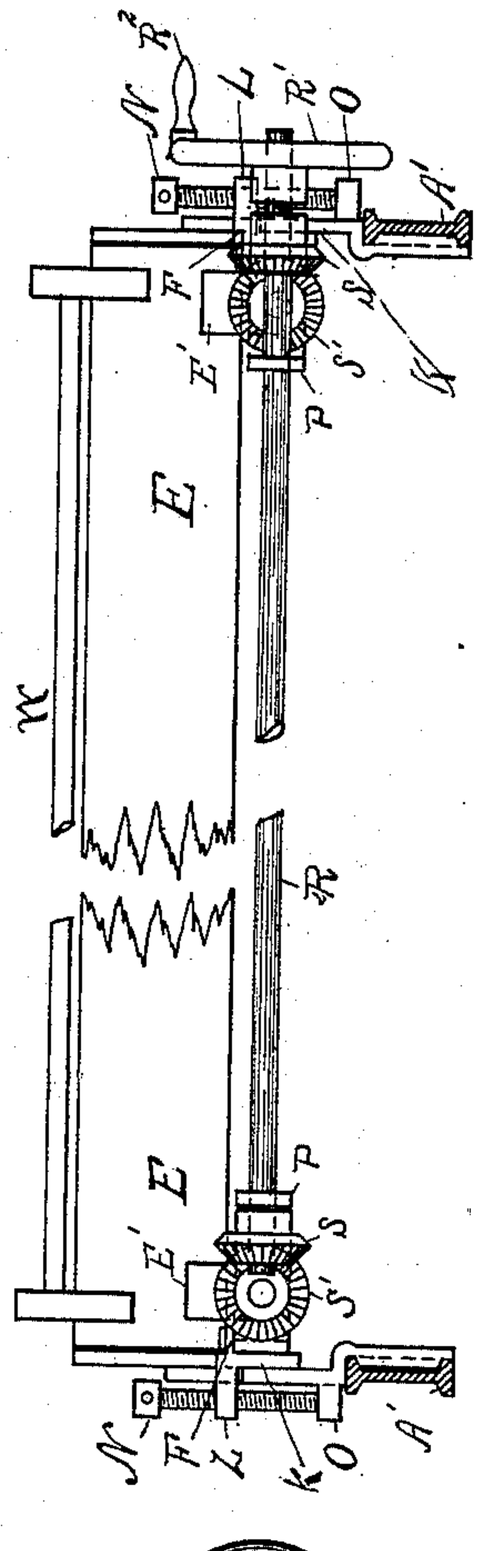


Fig 4

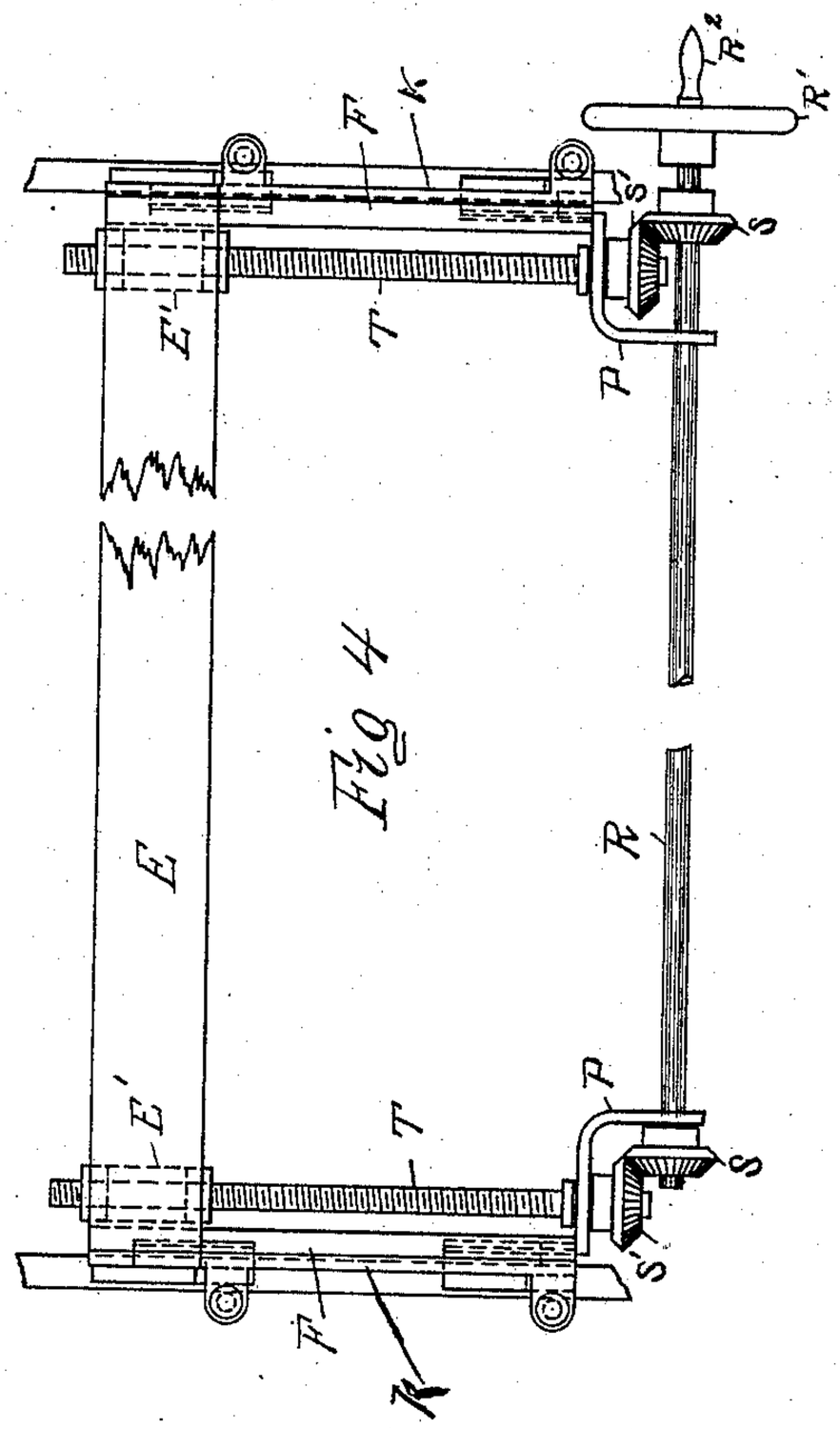


Fig 5

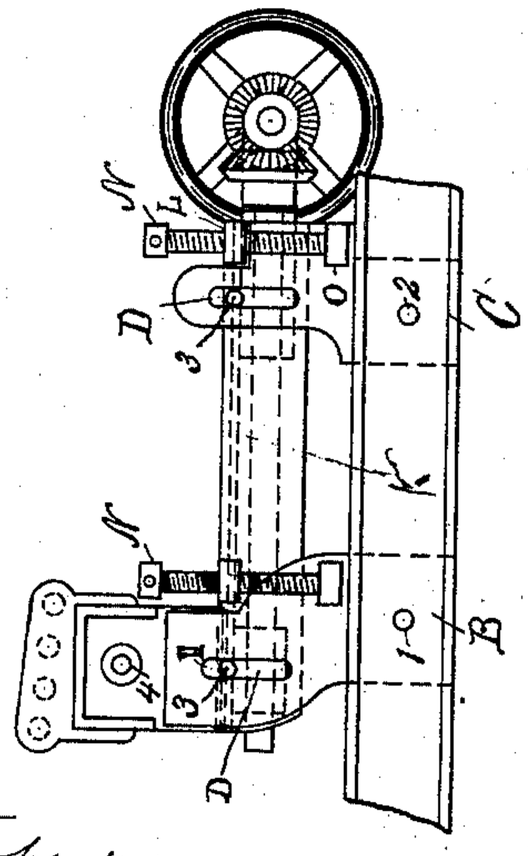
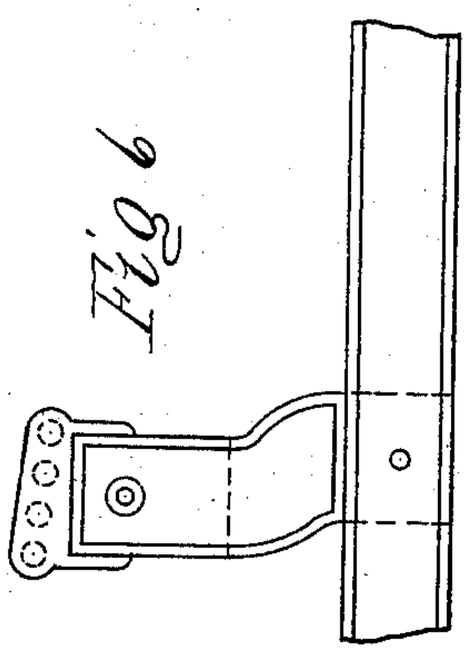


Fig 6



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(No Model.)

4 Sheets—Sheet 4.

JOHN NIGHTINGALE & JOSEPH NIGHTINGALE.

MECHANISM FOR FACILITATING TYING IN WARPS IN LOOMS.

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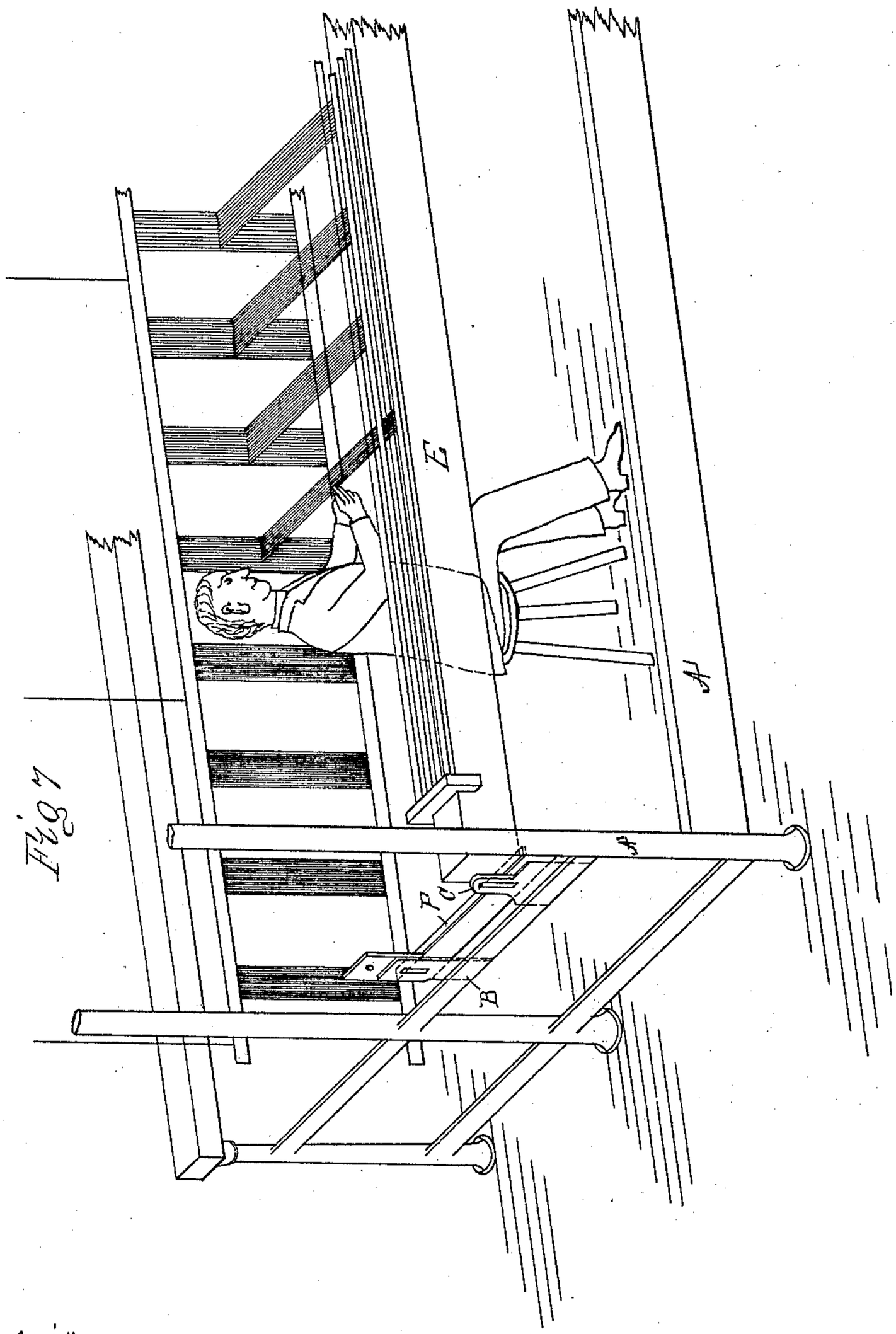

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UNITED STATES PATENT OFFICE.

JOHN NIGHTINGALE AND JOSEPH NIGHTINGALE, OF PATERSON, NEW JERSEY.

MECHANISM FOR FACILITATING TYING-IN WARP IN LOOMS.

SPECIFICATION forming part of Letters Patent No. 431,989, dated July 8, 1890.

Application filed April 12, 1889. Serial No. 306,962. (No model.)

To all whom it may concern:

Be it known that we, JOHN NIGHTINGALE and JOSEPH NIGHTINGALE, citizens of the United States, residing at Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Mechanism for Facilitating Tying-In Warp in Looms, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

When introducing a new warp or warps in a loom the several threads composing the incoming warp or warps are united with the threads of the outgoing warps by twisting, the operation being known in weaving parlance as "twisting-in."

The operation of uniting the warps by twisting has usually been done from the front of the loom, from which position, owing to the long reach required, the operation of twisting-in of the warps is made tedious, tiresome, and expensive.

The object of our invention is to provide means by which the work of twisting-in, or of uniting the ends of the threads of the incoming and outgoing warps, is made less tedious, less tiresome, and less expensive.

The objects sought we attain by the use of devices illustrated in the accompanying drawings, which will be hereinafter fully described and claimed.

Figure 1 shows in elevation one end of a loom with our invention attached. Fig. 2 is a broken rear elevation of the same. Fig. 3 shows our invention in detail detached, the shafts, beams, &c., being broken in such figure. Fig. 4 is a broken plan of the same. Fig. 5 is an end elevation of the same. Fig. 6 shows a portion of the loom-frame with standard without our invention; and Fig. 7 shows a portion of the loom in perspective, in which figure the beam is removed according to our invention, with a weaver in position twisting-in the warps at the place of their connecting.

A represents a loom of ordinary build, having the usual supporting-frame A′, shaft *b*, crank-arm *c*, lay *d*, heddles *e*. The loom, which is constructed as usual, need not, it is thought, be further described herein.

On the different sides of the loom-frame, and in a suitable position thereon, we arrange and fix by bolts 1 and 2 standards B and C. The standards B and C are each provided with a slot D to accommodate bolts 3, by which to hold in position a movable frame K, which latter is provided with an inwardly-projecting flange F and screw-nuts L, in which screw-nuts are threaded screws N, which are arranged to bear at their lower ends in steps O on the standards, the screws being adapted, when turned in either direction, to effect the vertical movement of the frame K, which is guided by the bolts in the slots D, formed therefor in the standards B and C. The inwardly-projecting flanges F on the opposite sides of the loom are adapted to support a transverse beam E, which latter is arranged to be moved horizontally on and over the said flanges F by screws T, which are threaded into the screw-nuts E′ of the beam, as shown. The screws T, which are longitudinally arranged in the loom, are journaled at the outer end, in common with a shaft R, in curved brackets P, and are adapted, under the influence of the shaft R, to effect the movement of the beam E horizontally on and over the flanges F, as hereinafter stated. The shaft R actuates screws T by means of gears S on shaft R and gears S′ on screws T. The brackets P are held in position by bolts or otherwise.

To effect the vertical movement of the frame K and beam E thereon, the bolts 3 are unscrewed, after which action the screws N are turned in the direction to raise or lower the frame and beam E, resting on said frame, and when this is done the bolts 3 are screwed up to fix the frame and beam in the desired position.

To give ample space for twisting-in or uniting the threads of the incoming and outgoing warps to render the work less tedious, less tiresome, and less expensive, bolts 4, which pass through near the tops of standards B into the end of beam E to hold the beam in its normal position, are removed, after which wheel R′ on shaft R is turned in the direction to cause screws T to carry beam E and tension-rods W thereon to the back of the

loom far enough to give ample space between the beam E and heddles *e* for the weaver to take his position therein to perform the work of twisting-in the warps at the point of their connecting, as shown in Fig. 7. The warps having been connected, the action of the wheel R′ is reversed and the beam E carried over the flanges by the screws T to its former and normal position, after which bolts 4 are replaced to hold the beam fixed.

By the use of our invention the twisting-in or uniting of the outgoing and incoming warps is more easily and more quickly accomplished, for the reason that the weaver is enabled by the removal of the beam E and the tension-rods W, carried by the beam, to take his position between the heddles and the beam at the point of their connecting, thus in a measure preventing long stoppages of the loom with their attendant expense.

Having described our invention, we claim as new and desire to secure by Letters Patent—

1. The beam E and rods W thereon, and the vertically-movable frames K, having flanges F and screw-nuts L thereon, in combination, with screws N, steps O, and standards B and C, whereby the frame is raised, lowered, and held in a suitable position and plane, substantially as described.

2. The combination of frame K, having flanges and screw-nuts, the beam E, supported by said frame, screws N, screws T, and gears on said screws, shaft R and gears thereon, brackets P, standards B and C, rods W, and loom-frame, whereby the beam E and rods W on said beam are moved vertically and horizontally, substantially as described.

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Witnesses:
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