(No Model.)

4 Sheets—Sheet 1.

J. W. WHITE.

WIRE WEAVING LOOM.

No. 547,530. Patented Oct. 8, 1895.

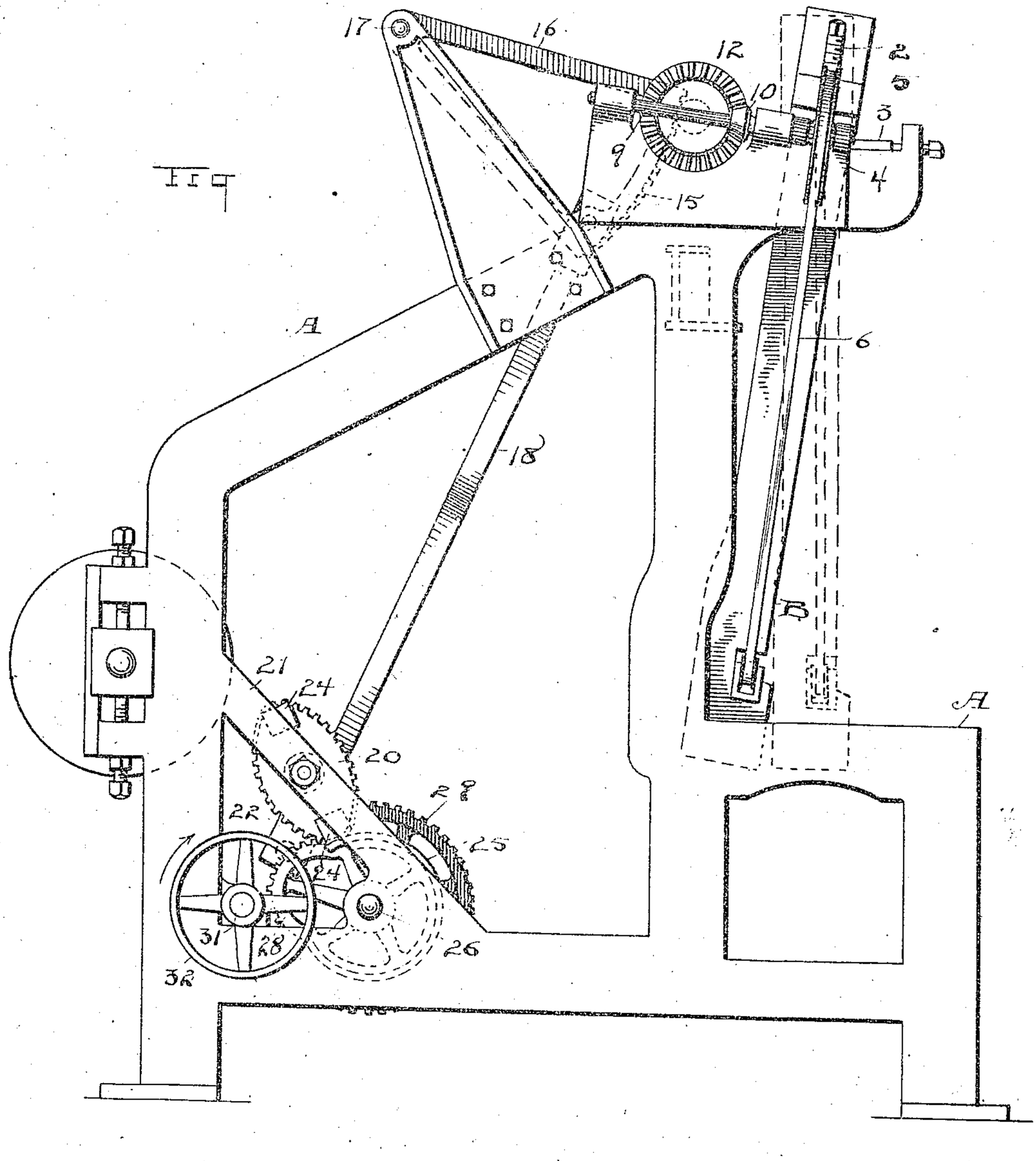

Fig. 1.

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By H. T. Fraker Att'y.

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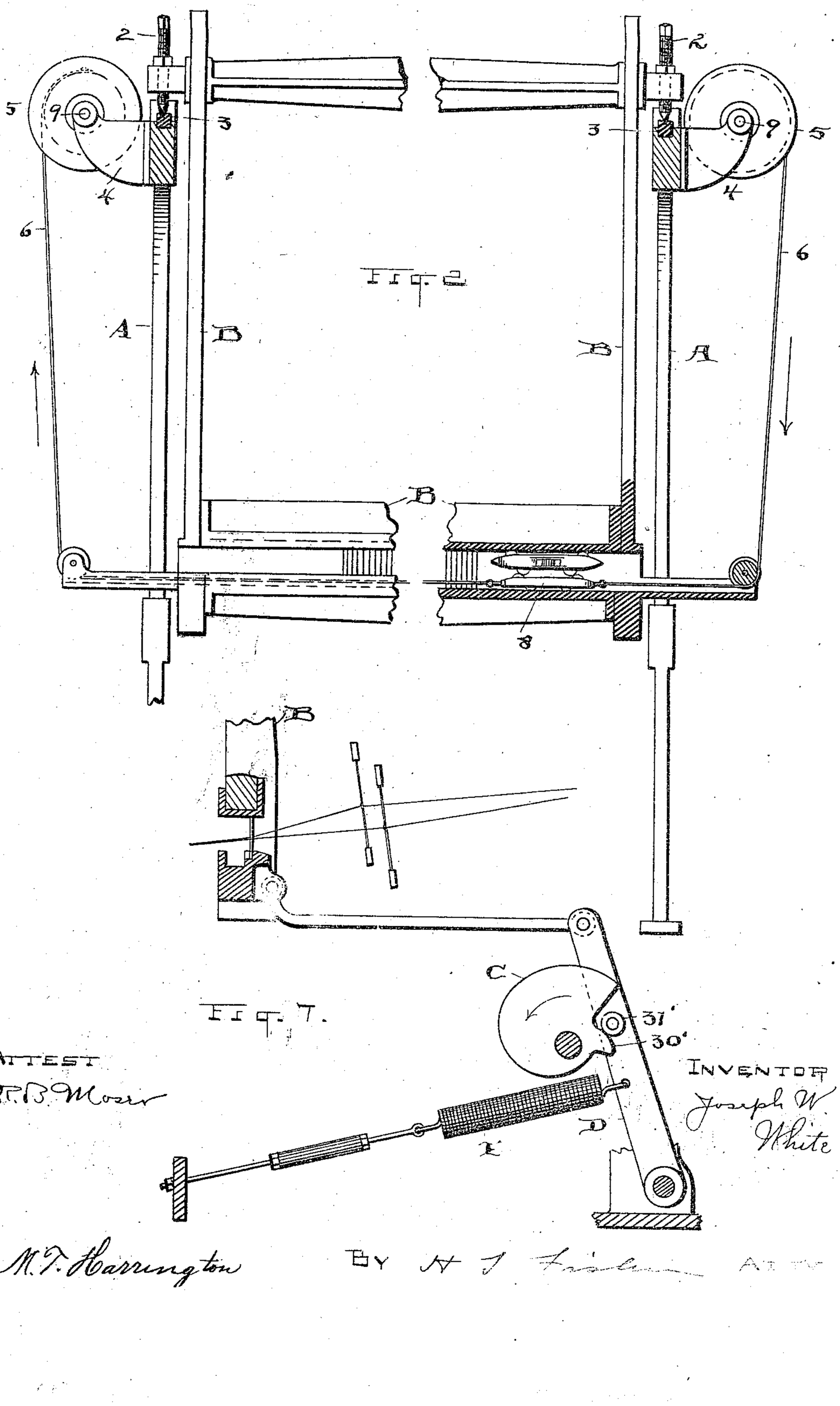

Fig. 2

Fig. 7.

Attest
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J. W. WHITE.

WIRE WEAVING LOOM.

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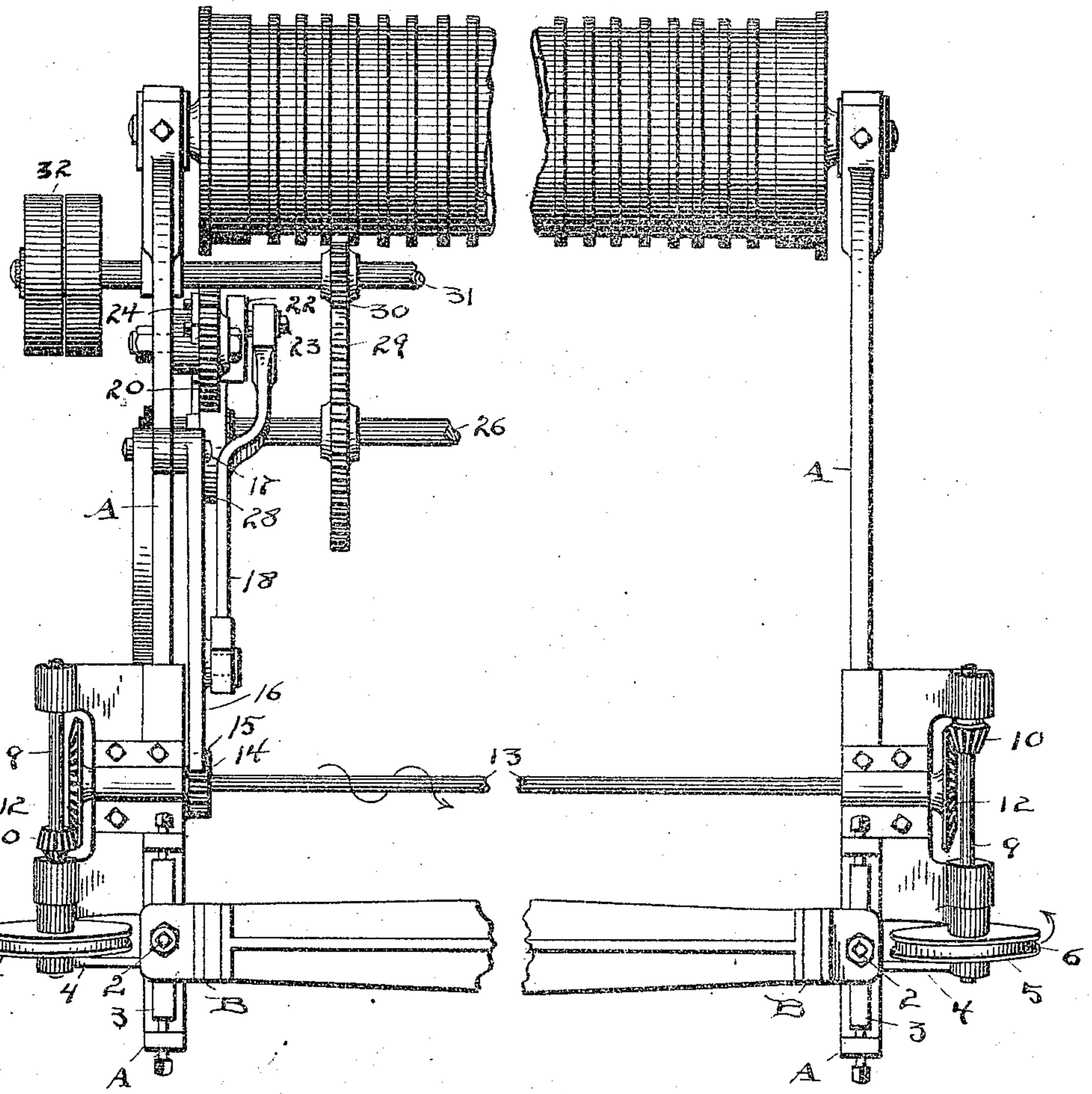

Fig. 2.

ATTEST

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(No Model.) 4 Sheets—Sheet 4.

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WIRE WEAVING LOOM.

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Fig. 4.

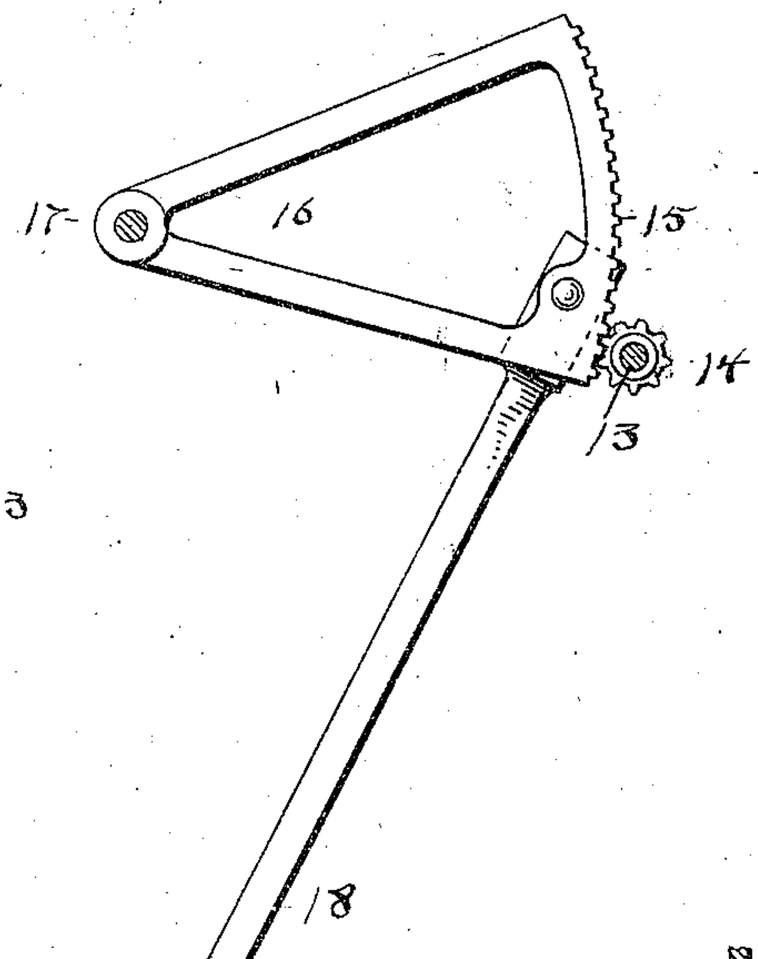


Fig. 5.

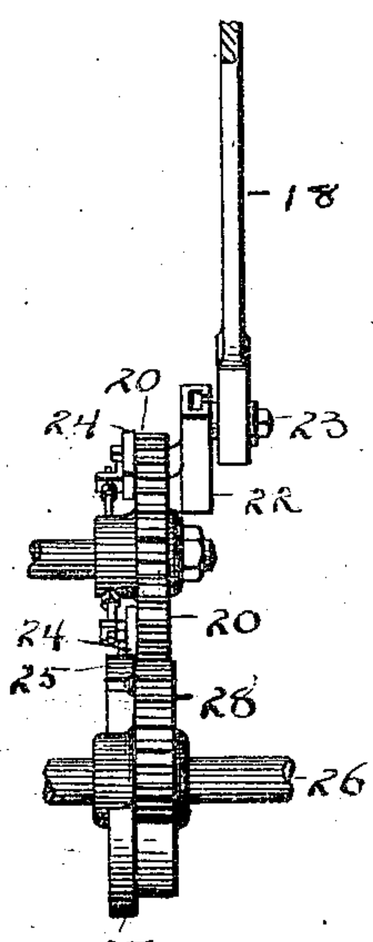
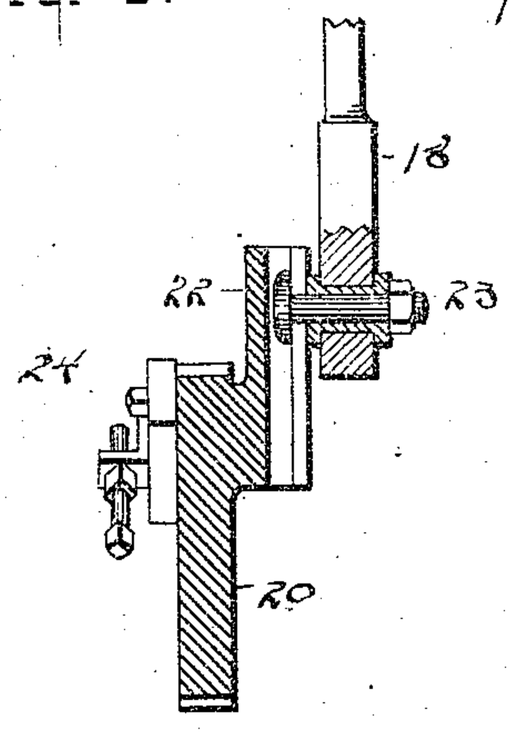


Fig. 6.



ATTEST.

E. S. Moser

M. T. Harrington

INVENTOR.

Joseph W. White

BY A. J. Fraser ATTY.

UNITED STATES PATENT OFFICE.

JOSEPH W. WHITE, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO THE TYLER WIRE WORKS COMPANY, OF SAME PLACE.

WIRE-WEAVING LOOM.

SPECIFICATION forming part of Letters Patent No. 547,530, dated October 8, 1895.

Application filed May 31, 1895. Serial No. 551,107. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. WHITE, a citizen of the United States, residing in Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Wire-Weaving Looms; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in wire-weaving looms; and the object of the invention is to provide means for more advantageously and uniformly operating the shuttle and its carrier than has hitherto been attained.

In the machine upon which this invention is an improvement the actuating mechanism for the shuttle and its carrier was down at the bottom of the lay, and part of it was substantially on a plane on the lay and part on the loom-frame, and clutches on said parts, respectively, came into engagement when the lay swung back and actuated the shuttle-operating mechanism; but this always was a violent engagement and actuation and hence objectionable, and I therefore conceived the present engagement, whereby an easy and natural and regular movement is substituted, and the actuating mechanism is located where it is not affected one way or another by the vibrations of the lay.

To these ends the invention consists in the construction and combination of parts, substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a loom equipped with my improvements; but only such parts thereof are shown as are necessary to show the improvements and their operation. Fig. 2 is a front elevation of the loom shown in Fig. 1, portions of the same being broken away to more clearly disclose the construction. Fig. 3 is a plan view, looking down upon Fig. 1. Fig. 4 is a detail in elevation of certain parts of the novel actuating mechanism. Fig. 5 is an edge elevation of the lower portion of Fig. 4, looking to the left or from the position of Fig. 5. Fig. 6 is a sectional elevation corresponding with line x x, Fig. 4. Fig. 7 is an elevation of the cam mechanism and its connections for actuating the lay, as hereinafter described.

In the several figures, A designates the frame of the loom wherever it may appear, and B is the lay or batten. It will be noticed in Fig. 2 that the batten is pivoted on the frame A by means of the two-threaded and pointed pivot-pins 2, which are set in small cavities in the steel centering-blocks 3. At the side of the frame A and opposite to the said pivot-points of the lay are outwardly-extending brackets 4, each supporting a pulley 5, having a flanged channel about its periphery adapted to receive the belts 6. These belts are connected at their lower ends with the shuttle-carrier 8 and at their upper ends with their respective pulleys 5 and are kept stretched or taut, so that the shuttle-carrier receives a prompt and positive movement back and forth when the sheaves 5 are rotated in either direction. Obviously there must be an alternating rotation in these sheaves, first turning together in one direction and then in the opposite direction and always a sufficient distance to carry the shuttle to the end of its travel. It will be noticed that the shafts 9, which support the sheaves 5, are on the same horizontal plane exactly as the pivot-points of the lay, so that while the shuttle swings back and forth with the lay and the sheaves are stationary there is no disturbance of the belts or cords connecting the sheaves and shuttle. Now, in order to operate these sheaves 5 in the manner and at the time desired, I have provided mechanism which is always in gear and which needs simply to come around in its time to rotate the sheaves. Thus upon the shaft 9, at each side, is a miter-gear 10, which meshes with a driving bevel-gear 12. This driving-gear on each side of the loom is fixed upon the shaft 13, which carries a pinion 14 near one end. A segmental gear 15, on a substantially-triangular frame 16, meshes with this pinion 14. The frame or triangle 16 is pivoted at 17 and has a limited swing thereon, being itself actuated by a connecting bar or rod 18, which, at its opposite end, is connected with the elliptical gear 20. This gear 20 is supported upon the inclined bar 21 of the main frame and upon one side has a channeled arm 22, in which is engaged an adjustable bearing-bolt 23 for the connecting-bar 18. Hence I can give more or less throw to the triangle 16 b-

adjusting the connecting-bar 18 nearer to or farther from the center of the ellipse 20, and the longer the throw of this connecting-bar the greater the rotation of the pinion 14, and at last the greater also the throw of the shuttle. Upon the opposite side of the ellipse 20 are adjustable stops 24 opposite one another and at the extremities of the ellipse. These have the function and purpose of engaging the smooth periphery of the composite wheel 25. This wheel is fixed upon counter-shaft 26 and is fashioned to a perfect circle, except at one side, where it has a segmental gear 28, out of its own vertical plane, but in a plane to mesh with the geared ellipse 20. Power is applied to the shaft 26 through a large gear-wheel 29 thereon meshing with the driving-pinion 30 on the power-shaft 31, having drive-pulleys 32.

Having now the foregoing construction and connection of parts and assuming that the power is applied and the machine started, all the parts from the drive-pulley to the wheel 25 are connected and kept in constant action; but from wheel 25 forward toward the shuttle the action will be intermittent and there will be no clutching or violent starting at any point. The intermittent action is first shown upon the ellipse 20, which will always receive a half-rotation through the segment 28 and will be left each time either in the identical relation seen in Fig. 4 or in the reverse relation, and first one way and then the other alternately, the stops 24 each time resting on the periphery of the wheel 25 and serving to limit the movement of the ellipse. The length of time during which the ellipse remains quiet is determined by the time taken for the wheel 25 to complete a rotation from disengagement to engagement of segment 28, and this is timed to suit the demands of the shuttle, so that just enough throw thereof and no more shall be made. Immediately after the segment 28 leaves the ellipse 20 the stop 24 drops onto the smooth surface of wheel 25 and the ellipse remains at rest. In this operation the triangle, Fig. 4, is first in the position, say, as shown in said figure, and then in the reverse position, and so on alternately. It will be seen in Fig. 3 that the shaft 13 has a bevel-gear 12 at each end and each meshing with a bevel-pinion 10. These gears and pinions are of the same size, respectively, so that by rotating shaft 13 both sheaves 5 will be turned exactly alike, thereby giving uniform action to the shuttle.

Referring to Fig. 1, it will be seen that the sheaves 5 are set somewhat at an inclination to a vertical plane, so as to throw them into the same plane exactly as they lie when it is in its back stroke and when the shuttle is thrown or carried from side to side. This keeps the belt or cord 6 always on its sheaves and in free operative relation.

In Fig. 7 I show a novel construction of cam C for operating the lay B. Heretofore I have relied on a rebound of the lay to complete the stroke of the lay itself and beat up the weft into close and uniform position; but I have found that with the most careful and painstaking labor there will be some difference in the size of the wire, and hence liability to noticeable difference in the evenness and compactness of the weaving. To overcome and avoid this objection I have provided the cam C with a subordinate and supplemental cam-heel 30′. The roller 31′, in operating bar D, drops onto small cam 30′ after leaving the shoulder of cam C, and the lay is slightly withdrawn and again released to be thrown forward by the actuating-spring E. This does the work thoroughly and never fails, and insures evenness of weaving however the wires may vary.

Obviously the invention is not necessarily restricted to all the details of construction pointed out in the description, but at nearly every place may be varied or modified, somewhat and still remain substantially the same as shown and described. Neither is it deemed necessary here to point out the particular instances wherein equivalent constructions might be adopted instead, it being left to those skilled in the art to discover and apply these for themselves, as may seem desirable.

The mechanism for operating the shuttle-carrier through or over the pulleys 5 in any case should be such as to multiply the travel of the shuttle four or more times as compared with its own initial movement, so as to give the requisite speed to the shuttle.

What I claim is—

1. The loom frame, the lay pivoted at its top on said frame, a sheave supported on said frame at each side on a plane with the pivot of the lay and having a grooved periphery, the shuttle carrier and belts each engaged at one end to said carrier and at the other end to said sheaves, in combination with the short shafts 9 carrying said sheaves, the pinions 10 thereon, and the gear wheels and shaft to rotate said pinions and means to actuate said gear wheels and shaft alternately in opposite directions, substantially as set forth.

2. The loom frame, the lay pivoted at its top on said frame, and a grooved sheave opposite each pivot, the shuttle carrier, the belts attached to said carrier and said sheaves, and a gear mechanism to rotate said sheaves together alternatively in opposite directions, in combination with a shaft and a pinion 14 to actuate said mechanism, pivoted part 16 having a segmental gear engaged with said pinion, and means to actuate said part 16, substantially as set forth.

Witness my hand to the foregoing specification this 27th day of May, 1895.

JOSEPH W. WHITE.

Witnesses:
H. T. FISHER,
R. B. MOSER.