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R. P. WINSOR.

DRIVING MECHANISM FOR CHAINS OF CLOTH TENTERING MACHINES.

(Application filed Mar. 22, 1897.)

(No Model.)

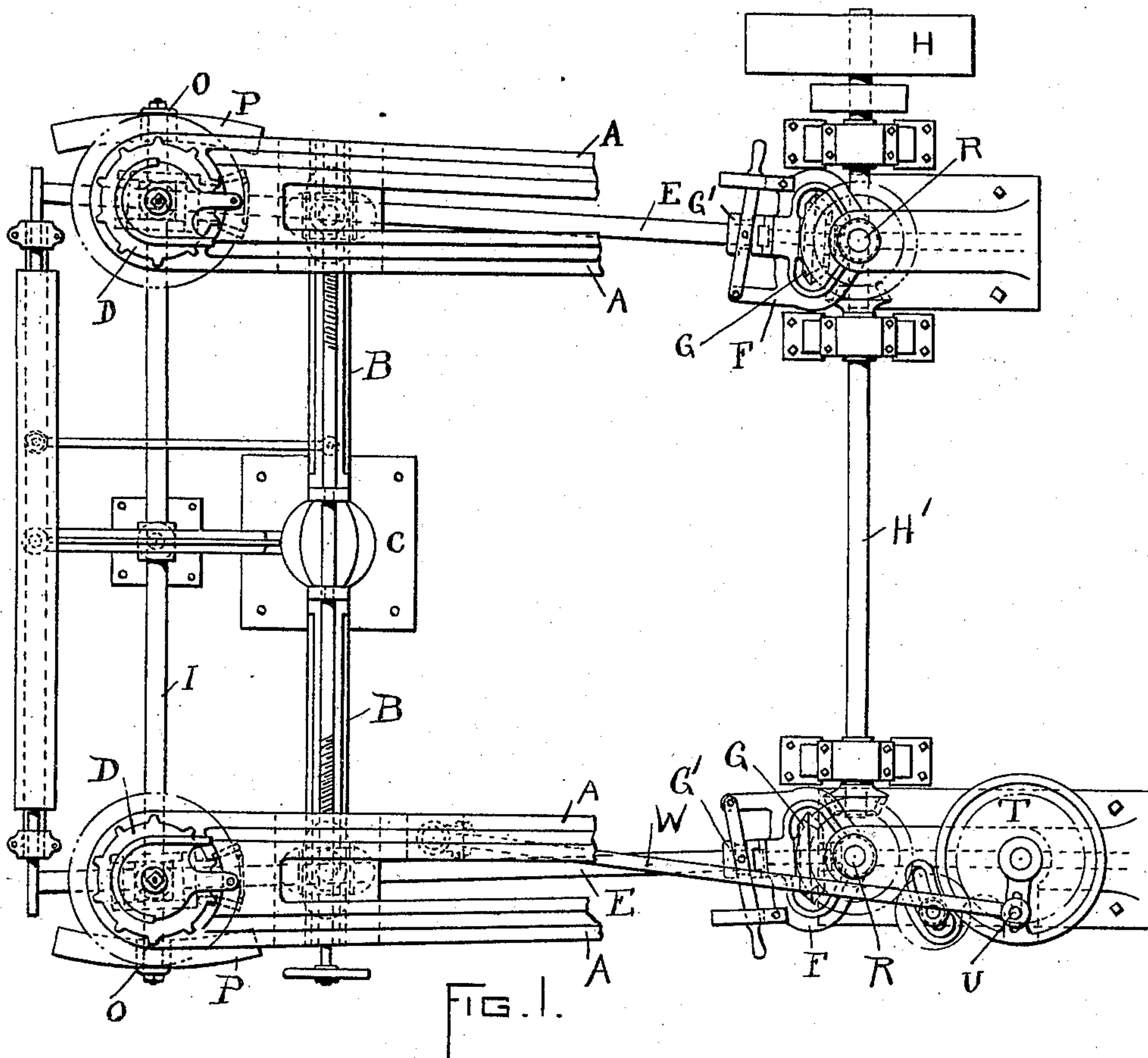


FIG. 1.

FIG. 2.

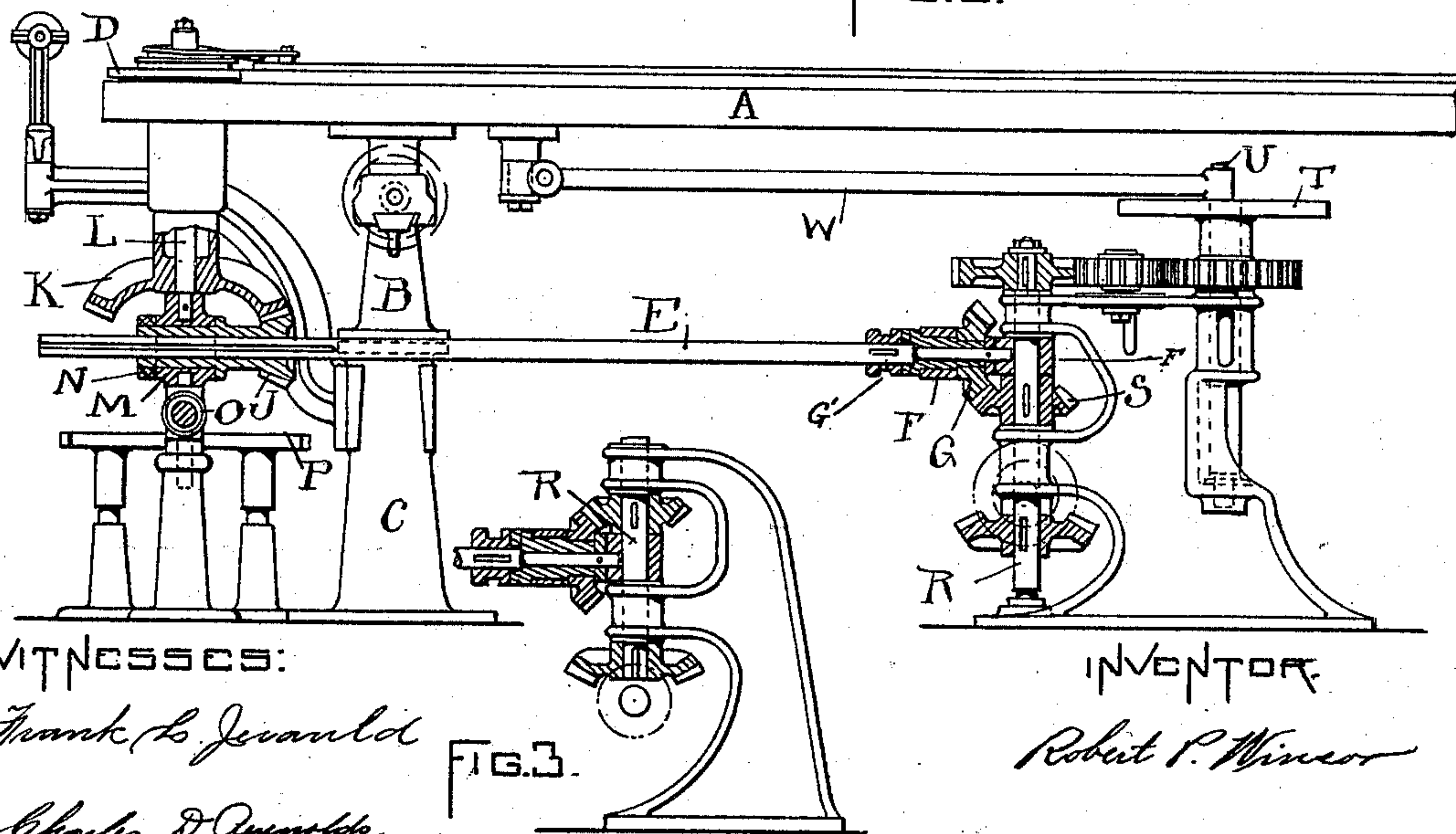


FIG. 3.

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DRIVING MECHANISM FOR CHAINS OF CLOTH-TENTERING MACHINES.

SPECIFICATION forming part of Letters Patent No. 638,306, dated December 5, 1899.

Application filed March 22, 1897. Serial No. 628,634. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT P. WINSOR, a citizen of the United States, residing in the town of Cranston, county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Driving Mechanism for the Chains of Cloth-Tentering Machines, of which the following, with the accompanying drawings, hereby made a part of this specification, is a description.

The common way of driving the carrier-chains of a tentering-machine heretofore in use has been by means of a shaft transverse of the machine oscillating as the side frames supporting the chains swing back and forth and driven by gearing at or near its center, this transverse shaft being connected at each end with proper gearing to drive the chains. The older form of the mechanism driving the oscillating shaft contained bevel-gearing, one of the bevel-gears being attached to an upright shaft under the axis of oscillation of the swinging shaft just referred to and a second gear, meshing with the first, being attached to the oscillating transverse shaft as near its center as practicable. The objection to this form of driving mechanism is that it gives an uneven motion to the chains, the gear upon the oscillating shaft being caused to turn at more than its normal speed while the side rails are swinging in one direction and at less than its normal speed when swinging in the other direction, according as the oscillation of the shaft carrying it causes it to run with or against the motion of the gear driving it. A recent modification places the driving-gear in the line of the axis of the oscillation of the swinging transverse shaft and substitutes spur-gearing for the bevel, rounding the teeth of the gears to permit of the oscillation. This latter arrangement will evidently cause the rounded teeth of the gears to wear badly by the oscillating motion of the shaft. These objections and imperfections are overcome by my invention.

In the accompanying drawings, Figure 1 is a plan view of one end of a tentering-machine, showing my new chain-driving mechanism, the side rails of the machine being broken off. Fig. 2 is a side elevation of the same; and Fig. 3 represents a portion of my driving mechanism

where it differs on the two sides of the machine, as hereinafter explained.

In the drawings, A A represent portions of the swinging side rails of the tentering-machine supported by arms, one of which is represented by B, and the stand C, resting upon the floor or other suitable foundation, the arms B being arranged to turn upon the stands C. Right and left screws are placed in the arms B to regulate the distance between the rails A to suit the width of the cloth treated. The tenter-chains, carrying clips or pins for holding the selvage edges of the cloth, run upon suitable tracks upon the rails A. These chains form no part of my invention and are not shown in the drawings. Tentering-machines are made in two styles with respect to the manner in which the chains run—one, where the chain in returning takes a path under its outward path, being operated by vertical sprocket-wheels, and the other, which is the one shown herein, where both paths are in a horizontal plane, the chain being operated by horizontal sprocket-wheels, as D D of the drawings. The description to this point is sufficient to make it understood by those familiar with such machines.

The object of my invention is to drive the sprocket-wheels D D, and consequently the chains driven by them, at a uniform speed while the side rails are swinging back and forth. I accomplish this by placing under each rail and substantially parallel with it when the rails are at their average distance apart, according to the class of goods for which the particular machine is more especially designed, a driving-shaft E, one end of which is connected with the rail, so as to swing therewith, and the other end of which is pivotally supported. As shown in the drawings, the end of the shaft E is supported in a pivoted yoke F. Near the pivoted end of the shaft is a beveled gear G, driven by suitable shafts and gearing from the pulley H, Fig. 1, and near the other end is the beveled gear or pinion J, Fig. 2, meshing with and driving a similar gear K upon the vertical shaft L, to which is attached the sprocket-wheel D. The gear G may be connected with the shaft E by means of the clutch G', Fig. 1. The clutches G' enable the operator to readily stop one chain



where it gets ahead of the other while the machine is still in motion, so as to give the other time to catch up, it being found in practice that it is necessary to do this at times. The gear or pinion J is not rigidly attached to the shaft E, but is arranged to slide upon it and a key or feather in the shaft, which may be in duplicate, if desired. The extended hub of the gear or pinion J, with the shaft E within it, passes through a suitable bearing or support M, Fig. 2, being held therein by a nut N upon its other end. The bearing M is pivoted to turn horizontally upon the end of the shaft L, as herein shown, and also supported underneath by a box upon the shaft I, the latter being arranged to slide on the shaft I whenever the distance between the rails is changed to suit a different width of cloth. It will be perceived that the gear J is thus connected with the rail A, so as to move with it as it swings back and forth, and is thereby kept in mesh with the gear K. While these gears must be kept in mesh by some means connecting the gear J with the swinging rail, it is evident that the arrangement and combination here specified is not the only one which could be used for this purpose. The shaft I is pivoted in its center and supported at either end by a roll O, running upon a support or track P, the latter resting on the floor or other foundation. The sole function of the shaft I, the roll O, and support P is to assist in supporting the weight added to the end of the rail A by the gearing and driving-shaft, and these means may readily be replaced by other mechanical devices to accomplish the same end, the essential requisite being to bring the end of the shaft E under the center of the sprocket-wheel D and support it there as the rail A oscillates back and forth with the center of the arm B as an axis.

The yoke F is pivoted about an upright shaft R, carried in a suitable stand or other support resting upon the floor or other foundation and driven by bevel-gears from the pulley H and its horizontal shaft H', Fig. 1. A beveled gear S is attached to the shaft R, which drives the gear G. The yoke F, shafts E and R, and their gears are duplicated for each side of the machine; but the gears are so arranged in relation to one another as to drive the sprockets D D in the proper direction for their respective chains, as is shown by a comparison of the position of the gears in Figs. 2 and 3, the latter showing their proper position for the opposite side of the machine. The yoke F forms a convenient way of providing a pivot for the shaft E at one end; but it is evidently not the only way of accomplishing the result. A convenient way of causing the rails to swing is by means of the disk T, with its eccentric-pin U, and rod W, connecting the pin U with the side rail A, the disk T being driven by proper gearing from one of the upright shafts R.

The extent of the swinging motion of the side rails is not in ordinary practice very

great, and the extent of the motion of the unpivoted end of the shaft E is found to be slight, being equal, as it is, only to the cosine of one-half of the angle of the oscillation of the arms B. With this slight movement of the free end of the shaft the motion at the gears G and S is so slight that it is taken up in their backlash, and the motion transmitted to the sprocket-wheel D is so far uniform that there is no appreciable unevenness in the motion of the chains. Should a longer swing for the side rails be desirable, the shaft E can be lengthened, if necessary, to prevent the gear G revolving about the pivot of the shaft E to any appreciable extent. The pivot of the shaft E, however, not only permits it to adapt itself to this movement of the rails in motion, but it also permits the rails of the tenter to be adjusted at proper distances for cloths of different widths; but the change in direction for this latter purpose will not be so great that the shaft may not still be said to be substantially parallel with the rail, and I have accordingly used that term in the claims in order to distinguish my shaft from the common transverse oscillating shaft.

I have shown my driving mechanism attached to that form of tenting-machine more common at the present day—namely, that in which the side rails approach and recede from each other as they oscillate; but if occasion occur it can easily be applied to a tenter where the side rails and chains slide back and forth always at the same distance for any given width of cloth, and in applying it to such a machine it may not always be necessary to make the shaft E swing upon a pivot, and with proper modifications of the gearing, which will readily occur to any mechanic, it may also be applied to the other form of tenting-machine, before mentioned, where the chains are operated by vertical wheels.

I claim as my invention—

1. In a tenting-machine, the combination of a side rail and means for swinging the same, a chain carried upon said rail and mechanism for operating the chain, a driving-shaft substantially parallel with said rail, a pivot near one end of said shaft and connections between the driving-shaft and the pivot to permit the shaft to swing about such pivot, means for driving the shaft near its pivoted end, connections between the shaft near its other end and the rail to cause it to swing about the pivot as the rail swings back and forth, and a gear sliding upon said shaft and connected with the rail to cause it to so slide, and means for driving the chain-operating mechanism from the sliding gear.

2. In a tenting-machine, the combination of a side rail and means for swinging the same, a chain carried upon said rail and mechanism for operating the chain, a driving-shaft substantially parallel with said rail, a pivot near one end of said shaft and means to cause the shaft to swing about the pivot, means for driv-



ing the shaft near its pivoted end, and means by which motion is communicated near its other end to the chain-operating mechanism.

3. In a tentering-machine, the combination  
5 of a side rail and means for swinging the same, and a chain carried by said rail and mechanism for operating said chain, said chain-operating mechanism embodying a driving-shaft arranged substantially parallel with said rail  
10 and connected to the rail so as to swing therewith.

4. In a tentering-machine, the combination of a side rail and means for swinging the same, and a chain carried by said rail and mechanism for operating said chain, said chain-operating mechanism embodying a driving-shaft  
15 arranged substantially parallel with said rail one end of said shaft being connected to the rail so as to swing therewith, and the other  
20 end of said shaft being pivotally supported.

5. In a tentering-machine, the combination

of a side rail and means for swinging said rail, and a chain carried by said rail and means for operating said chain, said chain-operating means embodying a pair of intermeshing  
25 gears, both of said gears being connected with said rail and arranged to move with said rail on its reciprocations to and fro.

6. In a tentering-machine, the combination of a side rail and means for swinging said rail,  
30 and a chain carried by said rail, and means for operating said chain, said chain-operating means embodying a driving-shaft substantially parallel with said rail and a pair of intermeshing gears, both of said gears being  
35 connected with said rail and arranged to move with said rail on its reciprocations to and fro.

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