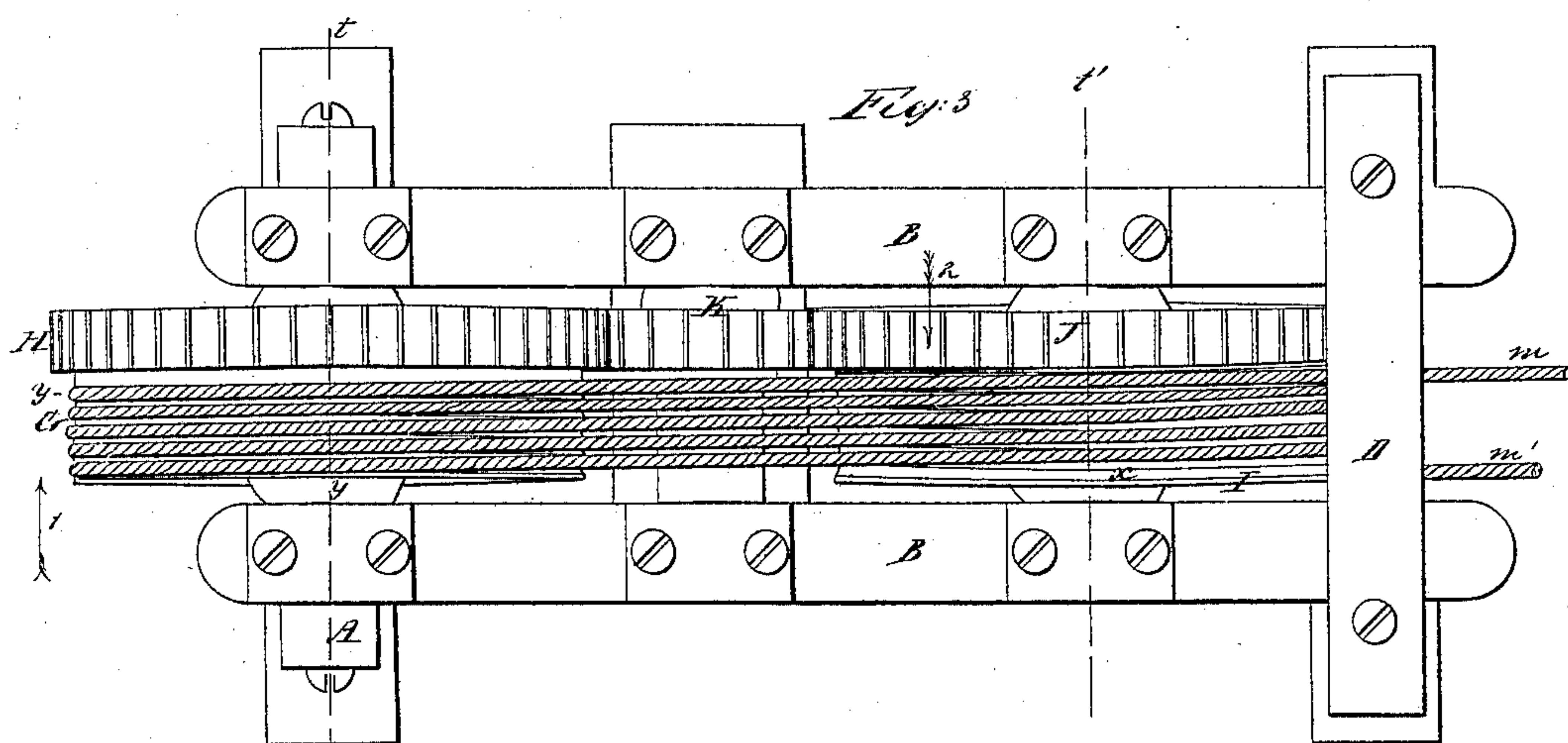
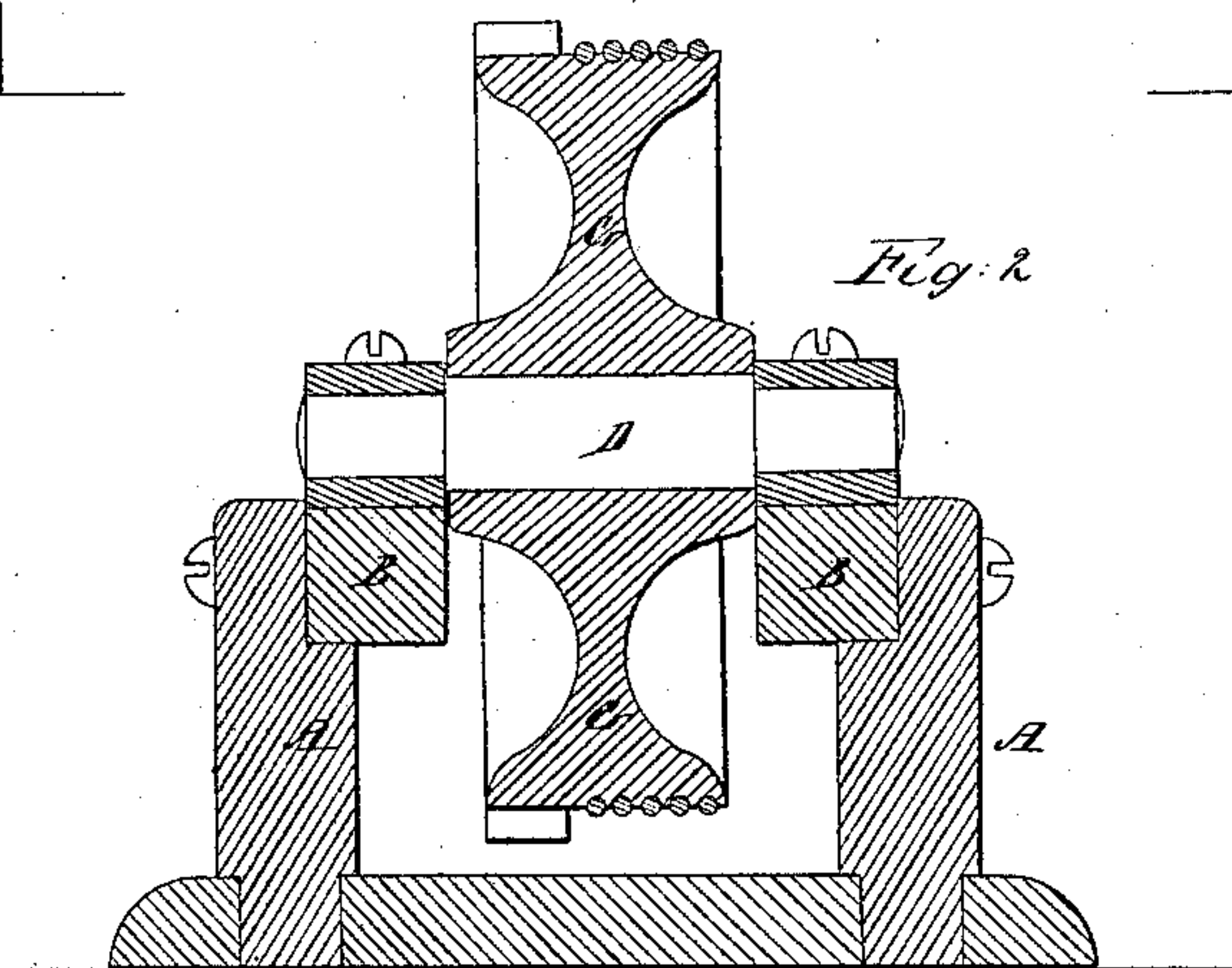
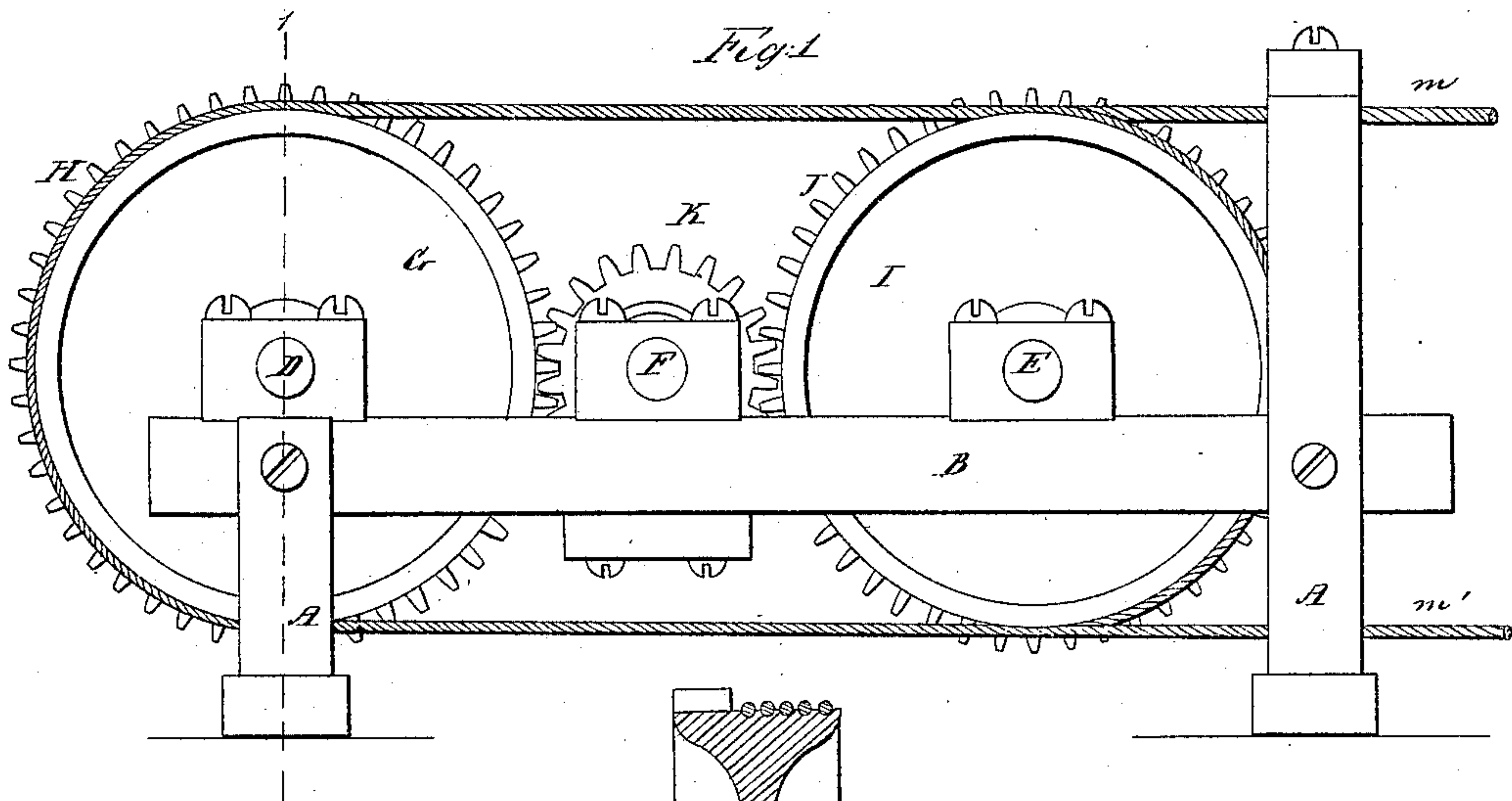


*S. B. Whiting,*  
*Mechanical Movement.*

*N<sup>o</sup> 59,697.*

*Patented Nov. 13, 1866.*



*Witnesses*  
*Mr. Albert Steel*  
*John Parker*

*S. B. Whiting* *Inventor*  
*By* *H. Howden*



# UNITED STATES PATENT OFFICE.

STEPHEN B. WHITING, OF POTTSVILLE, PENNSYLVANIA.

## IMPROVEMENT IN ROPE-DRIVING MACHINES.

Specification forming part of Letters Patent No. 59,697, dated November 13, 1866.

*To all whom it may concern:*

Be it known that I, STEPHEN B. WHITING, of Pottsville, Schuylkill county, Pennsylvania, have invented certain Rope-Driving Machinery; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the use of two drums, inclined and arranged laterally in respect to each other, substantially as described hereinafter, so that a rope with any desired number of coils passing around the said drums may be driven without any tendency of the said coils to crowd one on another or to bear hard against the sides of the grooves, and so that the desired amount of friction to prevent the coils from slipping on the drums may be obtained.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a side view of my improved driving apparatus for ropes; Fig. 2, a vertical section on the line 1 2, Fig. 1; and Fig. 3, a plan view.

Similar letters refer to similar parts throughout the several views.

The frame-work consists, in the present instance, of two longitudinal beams, B and B', connected to uprights A, the whole being firmly secured to a substantial foundation. In suitable boxes *a* on the frame turn the shafts D and E and the intermediate shaft, F. To the shaft D is secured a drum or pulley, G, on one edge of which is a cog-wheel, H, and on the shaft E is a similar drum or pulley, I, having on the edge a cog-wheel, J, these two wheels being geared together by a pinion, K.

An endless wire rope is coiled several times around the drums, in the manner shown in the drawings, the portion *m*, Fig. 3, of the rope passing over and in contact with the top of the pulley I directly to the pulley G, thence round the latter to the pulley I, under and over the same to the pulley G, round and under the same again to the pulley I, and so on, coil after coil, until the rope leaves the apparatus at *m'*.

The apparatus has been designed in this instance for hauling loaded cars up inclined planes on railways and lowering other cars, the end of the portion *m* of the rope being connected to a train of cars on one track, and the end *m'* to a train of cars on another track.

Much difficulty has been experienced in apparatus of this class owing to the slipping of the wire rope on the driving-pulleys for want of sufficient friction. The main evil, however, has been the traversing of the coil laterally on the drums as usually arranged.

In order that I may use pulleys round which pass several coils of rope, as shown in the drawings, and thereby prevent the possibility of any slipping of the rope, and at the same time prevent the coils from crowding on each other or bearing hard on the edges of the grooves, I incline the pulleys slightly in respect to each other. Thus the shaft D in Fig. 2 is inclined, being higher at the right than at the left, the pulley consequently being inclined, and leaning at the top in the direction of the arrow 1, Fig. 3, while the other shaft, E, has a contrary inclination, so that its pulley I leans at the top in a direction contrary to that of the pulley G.

The inclination of the drums in respect to each other should be such that a plane passing through the drum G at right angles to its axis would be inclined to a plane passing through the drum I at right angles to its axis, in the ratio of the distance between the grooves to the diameter of the drum, the axes of the drums being in parallel planes.

The lateral position of the inclined planes in relation to each other is such that a plane, *y*, passing through the center of the first groove of the pulley G at right angles to its axis would intersect a plane passing through the first groove of the other drum at right angles to its axis at its upper periphery, and the same plane *y* would intersect a plane passing through the center of the second groove of the drum I at its lower periphery. In other words, the drums are so inclined and so situated laterally in respect to each other that the rope in all cases traverses in the same plane as the center of the groove with which the rope is in contact. Hence the several coils cannot crowd against each other even in the absence of the grooves,

which are used merely to contain the rope and add to the friction.

It should be understood that the teeth, either of the wheels or the pinion, or both, should be inclined in accordance with the inclination of the drums.

It will be seen that the apparatus is adapted to inclined planes of any length, there being no limit to its capacity as regards the length of the rope acted on, whereas in other apparatus the drums have to be made of a capacity sufficient to accord with the length of the rope operated on.

I claim as my invention and desire to secure by Letters Patent—

The use of two drums inclined and arranged laterally in respect to each other, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

S. B. WHITING.

Witnesses:

H. HOWSON,  
WM. HALL WAXLER.