

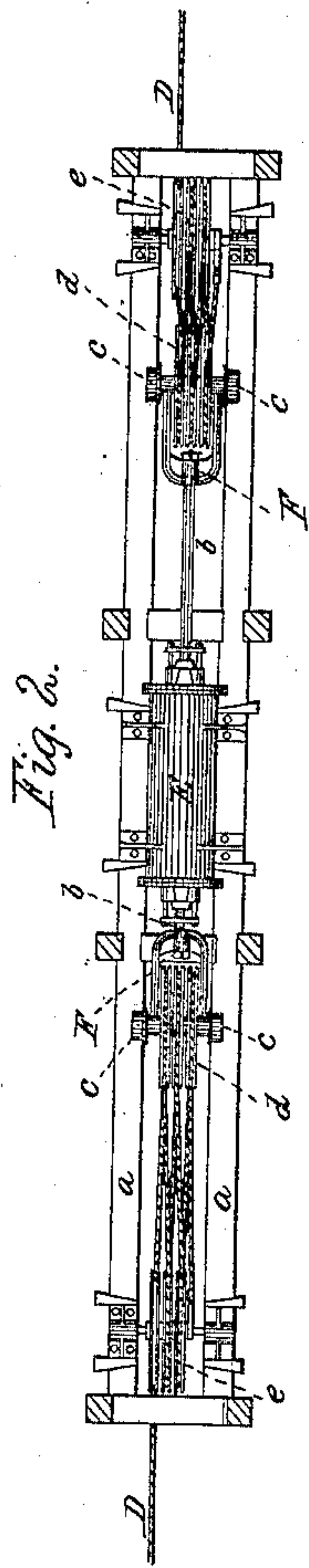
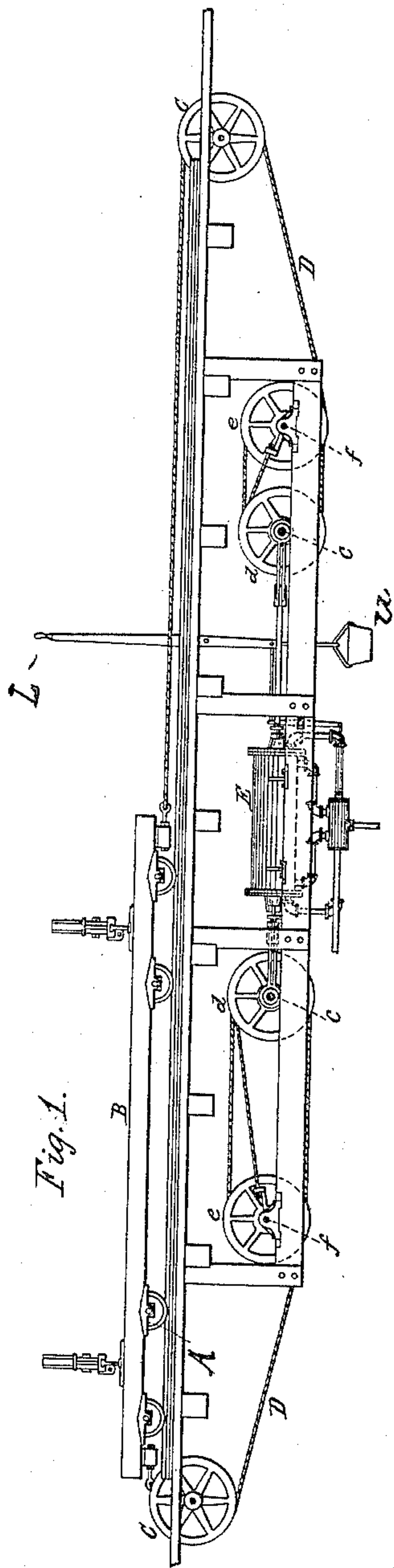
(No Model.)

C. F. THOMPSON.

POWER FEED MECHANISM FOR LOG CARRIAGES OF SAW MILLS.

No. 409,883.

Patented Aug. 27, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES F. THOMPSON, OF NORWOOD, OHIO.

POWER-FEED MECHANISM FOR LOG-CARRIAGES OF SAW-MILLS.

SPECIFICATION forming part of Letters Patent No. 409,883, dated August 27, 1889.

Application filed August 28, 1886. Serial No. 212,117. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. THOMPSON, a citizen of the United States, residing at Norwood, Hamilton county, Ohio, have invented 5 new and useful Improvements in Power-Feed Mechanism for Log-Carriages of Saw-Mills, of which the following is a specification.

My invention relates to power-feed mechanism for log-carriages of saw-mills, its object being to produce a practical and efficient 10 mechanism, to be operated by steam or water power, for moving the log-carriage and its load with equal facility in either direction under the control of the operator.

15 To this end it consists in the combination and arrangement of parts, as hereinafter more fully set forth, embodying generally a double-acting steam or water cylinder arranged centrally beneath the carriage runway, with a piston-rod projecting at each end, 20 and duplicate rope-and-pulley connections extending to both ends of the log-carriage, constructed as set forth herein.

Mechanism embodying my invention is 25 illustrated in the accompanying drawings, in which—

Figure 1 is a general side elevation of the entire apparatus and mechanism complete; and Fig. 2, a plan view of the motor mechanism, omitting the log-carriage and its runway. 30

In the efficient working of such saw-mills it is desirable to economize as much as possible the time lost in shifting the carriage and its log back and forth to and from engagement with the saws or saw. This requires powerful and perfect driving mechanism and connections, which must be at the same time simple, durable, and economical in weight. The use of rack and pinion or cogged 35 gears of any kind is objectionable because of the liability to strip or break teeth in the sudden and powerful initial and terminal impulses required in starting and stopping the carriage. Ordinary belting connections are 40 also unsuitable by reason of slipping and stretching of belts under these strains. For such connections I have therefore substituted a rope of wire; but it should be noted that to render this practicable and durable in service I have found it necessary to employ an ar-

45 rangement of pulley mechanism which distributes the strains referred to throughout a considerable length of the rope with an approximation to uniformity. It should also be noted that, since these strains are liable to 55 break or bend a piston-rod under compressive strain, I employ a cylinder with its piston-rod extended through both ends, with a duplicate rope-and-pulley gearing carried at each end, whereby the strains upon the piston-rods are 60 tensile at all times. With this preliminary explanation I may proceed to a detailed description of the mechanism employed by reference to the drawings.

A designates the log-carriage runway; B, 65 the log-carriage; and *a a*, two stanchions parallel with those of the runway, preferably suspended beneath the same by suitable braces or girders.

Upon and between the stanchions *a*, centrally in relation to the runway A, is mounted 70 a steam or water cylinder E, having the ordinary piston-head (not shown) and a piston-rod *b b*, projected at both ends. The cylinder is provided with the usual admission and 75 exhaust ports, and a governing-valve connected with and operated by a hand-lever in convenient reach of the operator, operating as hereinafter described.

The piston-rod *b b* carries at each end a 80 cross-head F, formed as a yoke and carrying between and projecting through the outer terminals of its jaws a stud or shaft, upon which projections are carried flanged friction-wheels *c*, rolling and guided upon the up- 85 per faces of the stanchions *a*. Between its jaws the stud carries a system of grooved idler-pulleys *d*, (preferably three in number,) running loose, the whole constituting in effect a movable "pulley-block." 90

Near the outer ends of the stanchions *a*, and across and between the same in fixed bearings, is journaled a similar stud *f*, carrying a system of grooved pulleys *e*, (preferably three in number,) corresponding in relative position with the pulleys *d*, carried in 95 the cross-head F and constituting in effect a fixed pulley-block. A grooved pulley C is also carried in fixed bearings at each end of the carriage-runway A for guiding the rope 100

to the carriage. Two ropes D, preferably of wire, are employed, each secured by one end, preferably, to an eye or collar upon the stud *f*, and extending thence over and back under the first pulley *d*, thence under and back over the first pulley *e*, and similarly around the second and third pulleys *d* and second pulley *e*, finally emerging under the third pulley *e*, (employed as a guide,) and thence around the pulley C to the carriage B. It will be obvious that the two ropes D may be combined into one, extending lengthwise through or under the carriage. The described arrangement of the rope D, by fastening its end upon the shaft *f*, not only brings the rope substantially in the vertical plane of the first pulley *d*, but also tends to hold the cross-head F down upon its guide-stanchions at all parts of the stroke.

The governing-valve may be of any suitable kind; but I prefer to employ the ordinary balanced piston-valve. It is operated by a hand-lever L, weighted at the bottom, as shown at *w*, to restore the valve always to its normal central position automatically when the lever is released. In such position the cylinder is inert.

In a machine corresponding to the illustrations here given the travel of the carriage is approximately six times the stroke of the piston. In order to obtain the necessary force to overcome the inertia of the carriage, the full power is turned on at the outset, the initial strain being taken up by the elasticity of the wire rope; and it will be seen that by the arrangement of pulleys a considerable relative length of rope is employed, so distributed over the pulleys *d* and *e* as to absorb the initial strain largely between the said pulleys. The cylinder connections are also used to "brake" the carriage toward the end of the travel; but it will be seen that by the duplex arrangement of the cylinder and piston-rods the strains upon the rods are always tensile strains, and that shocks are largely absorbed by the elastic nature of the wire rope employed, as described. The resulting action upon the carriage is such as to produce no shock, yet an extremely rapid and entirely controllable

movement, which may be limited as desired to a nicety by the skill of the operator acquired by practice.

It will be obvious that the cylinder E and connections may be arranged at the side of, instead of beneath, the runway A.

I am aware that a cylinder with double projecting rod has been used in connection with elevator mechanism, also that ropes of various kinds have been used for this and kindred purposes. I claim, therefore, only the combination, as hereinafter set forth, of the double-ended cylinder and the rope and pulley systems as applied to a log-carriage for the purpose of producing a quick and powerful motion in either direction without shock or undue strain upon any part.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. The combination, with the saw-mill log-carriage, of a power-cylinder having its piston-rod projected at both ends, and carrying at each end a pulley-block arranged as a cross-head, a fixed pulley-block or set of pulleys attached at each end of the framing, beyond and in the line of stroke, and wire ropes connected to the carriage at each end and carried around fixed idlers at the ends of the carriage-runway, and thence rove around the movable and fixed pulleys, in succession, to a terminal fastening upon the cylinder-framing, substantially as set forth.

2. The combination, with the driving-cylinder, its cross-head guided by friction-wheels upon the cylinder-stanchions and carrying a set of pulleys, and a fixed set of pulleys secured to the stanchions, of the eyes or loops carried upon the shaft of the fixed set of pulleys, and the rope secured thereto and carried first over and then under the cross-head pulleys and opposite fixed pulleys alternately to the carriage, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES F. THOMPSON.

Witnesses:

L. M. HOSEA,

E. L. KERR.