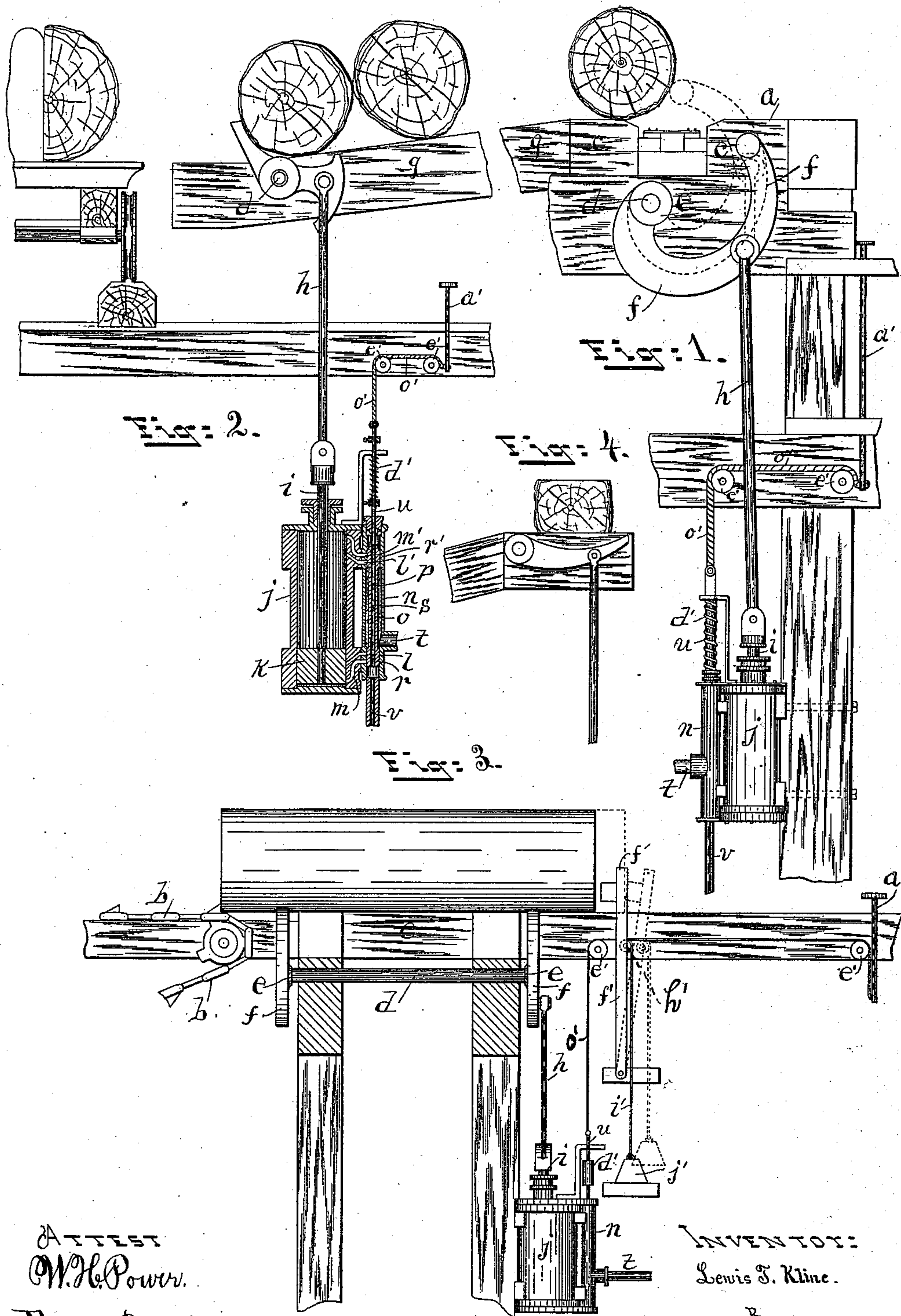


(No Model.)

L. T. KLINE.  
LOG ROLLING DEVICE.

No. 377,717.

Patented Feb. 7, 1888.



ATTEST  
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# UNITED STATES PATENT OFFICE.

LEWIS T. KLINE, OF BAY CITY, MICHIGAN.

## LOG-ROLLING DEVICE.

SPECIFICATION forming part of Letters Patent No. 377,717, dated February 7, 1888.

Application filed August 27, 1886. Serial No. 211,968. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS T. KLINE, a citizen of the United States, residing at Bay City, in the county of Bay, State of Michigan, have  
5 invented certain new and useful Improvements in Log-Rolling Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in  
10 devices for rolling and moving logs and cants in saw-mills, and is designed more particularly as an improvement on the device described in Letters Patent granted to me May 22, 1883, numbered 278,022; and the invention consists, partly, in a change in the form  
15 and location of the parts, and also in devices for cushioning and stopping the movement of the apparatus, and more especially in the means of operating the actuating devices.

20 The objects of the invention are to render the device capable of a greater range of work by so constructing the parts that it may be applied to moving logs and cants in various positions, and, if desired, to operate the parts  
25 automatically by the action of the moving log or cant, and to render the machine more durable and rapid in operation. The devices I employ to attain these objects are illustrated in the accompanying drawings, in which—

30 Figure 1 is an end view of a log-deck with my improvement attached thereto. Fig. 2 is the log-roller as applied to a skidway, partly sectional. Fig. 3 shows the device as applied to moving a cant. Fig. 4 is a side view of  
35 Fig. 1.

*a* represents a log-deck, and *b* is a chain, which brings the logs into the mill with an end movement, the chain being provided with projecting spurs for catching in the log.

40 *c* are slide-timbers, upon which the log rests.

*d* is a shaft suitably journaled and supported in position on one side of and below the slides *c*. Upon the shaft *d* are rigidly keyed the hubs *e*, and extending from one side of the hub  
45 is a curved arm, *f*. I form this arm with a rounded end, which, when the device is at rest, is just below the skidway and on the side of the slide *c* opposite the shaft *d*, the curved portion of the arm being below the  
50 slides. To the central portion of this arm *f* is pivoted the upper end of a connecting-rod, *h*, the opposite end of the rod being pivoted

to the outer end of the piston-rod *i* of a steam-cylinder, *j*, which is properly secured to the frame-work below. This steam-cylinder *j* is  
55 constructed and arranged so that a portion of the exhaust-steam will form a cushion for the piston at either end of the cylinder, and may be of any suitable construction for that purpose. The devices I employ are illustrated in  
60 the sectional portion of Fig. 2, the cylinder *j* being provided with exhaust-ports *l* and *l'* and receiving-ports *m* and *m'*, which connect with a valve-casing, *n*.

Within the casing *n* is a valve, *o*, having a  
65 central opening, *p*. The portions *r* and *r'* at the ends of the valve, and which cover the ports, entirely fill the casing *n*, while the central portion connecting the portions *r* and *r'* is reduced to form the chamber *s* between the  
70 valve and casing, and connected with this chamber *s* is an exhaust-pipe, *t*. A valve-stem, *u*, passing through the usual packing-box, is secured to the upper end of the valve, and a steam-pipe, *v*, is connected with the  
75 lower end of the valve-casing.

The operation is as follows: The valve *o* is raised to uncover the ports *m* and *l'*, and steam from the boiler passes through the pipe *v* and receiving-port *m* beneath the piston *k*, driving  
80 the piston upward until the exhaust-port *l'* is covered by the piston. The steam above the piston is during this operation passing freely out through the exhaust-port *l'*, the chamber *s*, and the exhaust-pipe *t*. After the exhaust-  
85 port *l'* is covered by the piston the steam remaining above is confined, and by the upward movement of the piston it becomes packed and forms an elastic cushion, which  
90 overcomes the lifting force of the steam below and arrests the movement of the piston and the mechanism connected thereto, and the valve *o* is then moved to the opposite end of the casing, uncovering the ports *m'* and *l*, and  
95 the steam then, passing through the opening *p* and port *m'*, forces the piston in the opposite direction, the exhaust-steam passing through the port *l* until the port is covered by the descending piston, and the steam then remain-  
100 ing below the piston forms a cushion which arrests the downward movement of the piston and the movement of the arms *f*, connected thereto, without jar or pounding.

The operation of the log-rolling device is



that when a log has been carried by the chain *b* to the log-deck *a* the valve is then raised and the piston forced upward. This action causes the arms *f* to swing upward, and the outer or free ends of the arms, coming in contact with the log, roll it out of its resting-place on the slide-timbers *c* and upon the skidway *g*. The valve *o* is then moved to the opposite end of the casing and the parts return to their former position.

The object of locating the shaft *d* in the position described and shown and of forming the arms *f* with a curve coming below the log-deck is so that the movement of the upper end of the connecting-rod *h* will be such as to bring the rod at all times in a nearly vertical position and nearly in alignment with the piston-rod, and also to allow the connecting-rod to be attached to the arms in a position to allow the piston to lift directly upon the load without reducing the leverage thereof.

Secured to the stem *u* of the valve *o* is the spring or weight *d'*, which operates to move the valve downward and into position for closing the ports *l* and *m* and opening the exhaust-port *l* and receiving-port *m'*, and a cord or chain, *o'*, is secured by one end to the upper end of the valve-stem *u*, and, passing over one or more pulleys, *e'*, its opposite end is secured to the lower end of a standard, *a'*, which is located near the pulleys *e'*, and with its upper end extending above the floor of the mill, so that the operator, pressing downward upon the standard in any manner, will move the cord and raise the valve *o* and give steam to the cylinder, and whenever the pressure is removed from the standard *o'* the spring or weight *d'* operates to bring the valve again to its position for closing the ports. This device may be automatically operated, so that the moving log or cant, if desired, will operate the valve by means of a vertical lever, *f'*, pivoted at its lower end to the frame-work below, and with its upper end extending upward to some distance above the slides *c* and directly in front of the forward end of the log, and in position that the moving log in coming forward will come in contact with and move the lever. A pulley, *h'*, is secured to the central portion of the lever, and a branch rope, *i'*, is passed over this pulley and provided with a counter-weight, *j'*, at its lower end, and its opposite end is secured to the rope *o'* or run to the valve-stem *u*. This allows the moving log or cant to move the upper end of lever *f'*, which, being connected to the valve-stem by the line *o'*, operates to move the valve *o*, and the weight *j'*, being of such dimension as to give a greater resistance than the spring or weight *d'*, allows the valve *o* to be moved upward to its greatest extent before the weight *j'* will be lifted, so that should the incoming log continue to move the lever *f'* after the valve has reached the limit of its upward movement the weight will then rise and avoid the liability of breaking the line or some other portion of the device. This arrangement allows the valve

to be operated either automatically or otherwise, and the line *o'* may be extended to some distance away and used whenever necessary to roll any logs of not the proper length to reach and operate the lever.

In Fig. 2 are shown the devices as applied to a log-roller for a saw-carriage, the operation of the arms being similar in all respects to that described in the said Letters Patent No. 278,022, except that the operation is more rapid and uniform, and the bumpers *k* and *L*, described in line 51 in the specification of the said Letters Patent, are rendered unnecessary, as the self-cushioning steam-cylinder, as here applied, is in all respects easier in operation and gives better working results, as the noise and jar of the machinery are avoided and the wear of the parts thereof is much less.

I do not confine my invention entirely to the precise form and location of the valve-operating mechanism or to the location and construction of the spring or weight *d'*, as these parts may be placed in some other position and operate in a like manner and produce a similar result.

I do not claim, broadly, the rocking arms with an ordinary steam-cylinder attached thereto, as that portion of the device is already covered by Letters Patent granted to me May 22, 1883, and numbered 278,022; but by the use of a steam-cushioning cylinder a new and beneficial result is obtained which imparts to the log a greater impetus by the steam acting upon the piston to the full length of the cylinder and then freeing the log suddenly from the action of the arms by the operation of the steam-cushions and allowing it to pass to the skidway without retarding its movement, as is the case with an ordinary cylinder, and this action allows the device to be operated more rapidly and reduces the strain upon the connections and avoids all noise and pounding of the cushions, besides allowing the parts to be constructed in a cheaper, more compact, and lighter form.

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

1. The combination, in a device for rolling logs, of a log-deck or skidway, a shaft journaled in the skid-timbers and provided with curved arms rigidly secured thereto, and a piston having a rod pivotally connected to one of the arms, with a steam-cushioning cylinder inclosing the piston and provided with a valve and receiving and exhaust ports, for the purpose set forth.

2. The combination, in a device for rolling logs, of a shaft journaled below the log-receiving timbers and provided with extended arms, and a steam-cylinder having a piston connected with the arms and provided with a valve and steam-cushioning ports, with devices operating the valve, consisting, substantially, of a line, *o'*, secured by one end to the valve-stem and supported by one or more pulleys, *e'*, and a standard, *a'*, located near one of the pulleys *e'*,



and with its lower end secured to the opposite end of the line *o'*, substantially as herein set forth.

3. The combination, in a device for rolling  
5 logs, of a shaft journaled below the log-receiving timbers and provided with extended arms, a steam-cylinder having a piston connected with the arms and provided with a steam-cushioning valve and ports, and a line, *o'*, secured  
10 to the valve-stem by one end and to a vertical standard, *a'*, by the opposite end and supported by one or more pulleys, *e'*, with a lever, *f'*, pivotally secured at its lower end and

having its upper end extending above the log-receiving timbers, and provided with a pulley, 15  
*h'*, on its central portion, and a line, *i'*, secured by one end to the cord *o'* and passed over the pulley *h'*, and a weight, *j'*, secured to the opposite end of the line *i'*, substantially as and  
20 for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS T. KLINE.

Witnesses:

JOHN C. COMFORT,  
W. F. DENISON.