

(No Model.)

2 Sheets—Sheet 1.

W. E. HILL.
STEAM FEED FOR SAWMILLS.

No. 531,723

Patented Jan. 1, 1895.

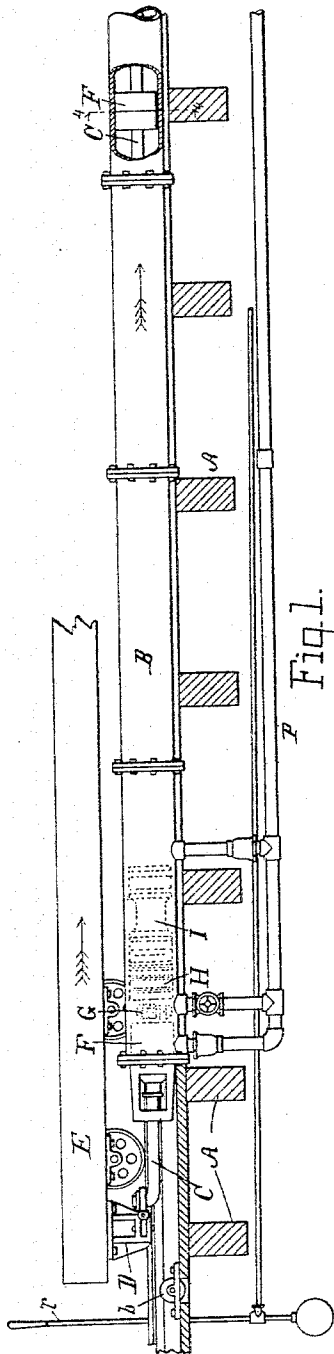


Fig. 1.

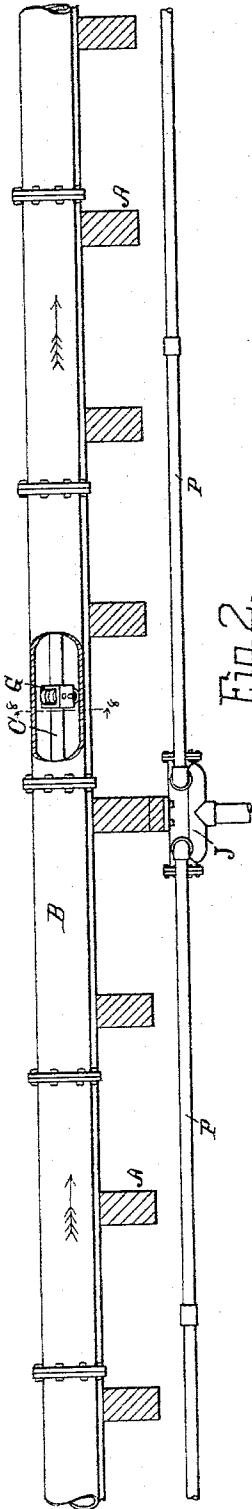


Fig. 2.

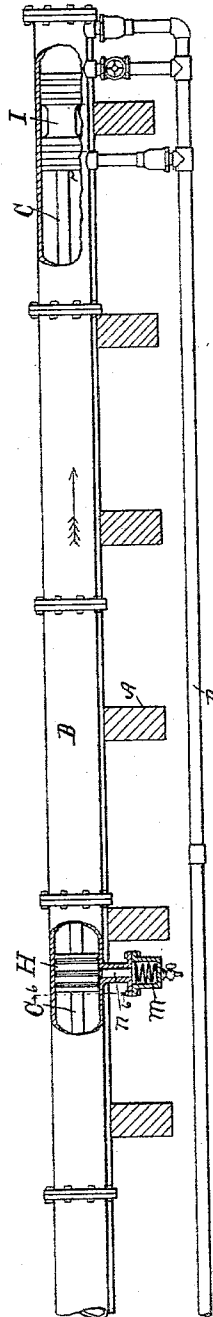


Fig. 3.

Witnesses:

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M. E. Blood.

Inventor.

William E. Hill.
By Fred L. Chappell.
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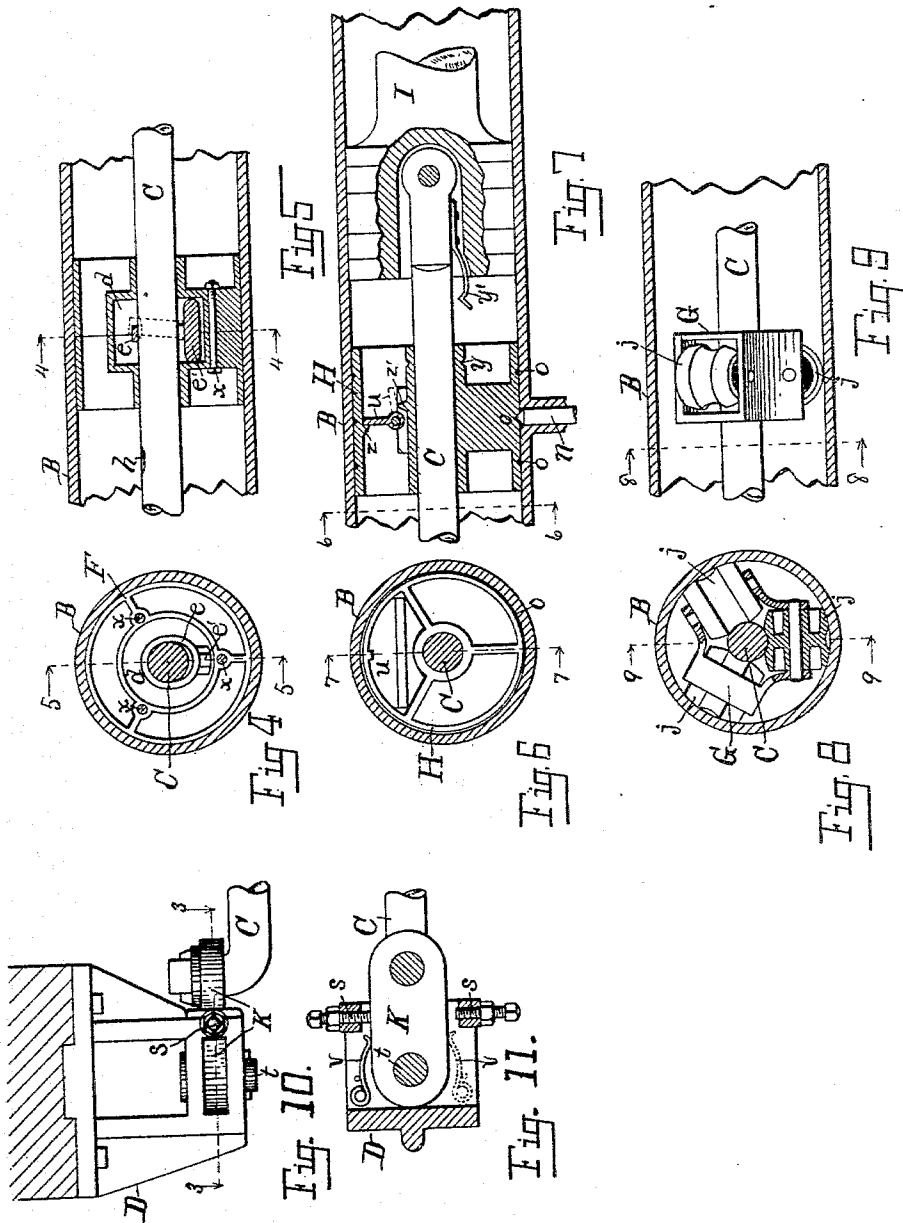
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

WILLIAM E. HILL, OF KALAMAZOO, MICHIGAN.

STEAM-FEED FOR SAWMILLS.

SPECIFICATION forming part of Letters Patent No. 531,723, dated January 1, 1895.

Application filed October 20, 1893. Serial No. 488,743. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HILL, a citizen of the United States, residing at the city of Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a certain new and useful Steam-Feed for Sawmills, of which the following is a specification.

My invention relates to direct acting steam feeds for sawmills and more particularly to the kind requiring very long steam cylinders. This kind of a device when adapted for use in sawing the very tall timber found on the Pacific slope often requires a steam cylinder one hundred feet long and a very common length of these cylinders is sixty feet. Where such very long cylinders are used, the piston rods are very heavy and very likely to sag and they also bring great weight to bear on the piston head causing it to rapidly wear away the lower side of the steam cylinder. Another difficulty to be overcome is the bending or buckling of these very long piston-rods when the power is applied. Again where there is a lateral variation in the carriage from irregularities of the track or from the offsetting of the carriage owing to the length of the leverage these piston rods press very hard on the stuffing boxes which are soon worn away.

The objects of my invention are to overcome all these difficulties by suitable guides and supports for the piston rod and suitable means of attaching the piston rod to the carriage so that slight lateral variations in the movement of the carriage shall not affect the piston rod. I accomplish these results by the mechanism shown in the accompanying drawings, in which—

Figures 1, 2 and 3 show a side view of a steam feed, in sections, embodying my invention, the same being an ordinary sixty foot feed drawn to a scale. Fig. 10 is a side view of the bracket and means of attaching the piston rod to the carriage. Fig. 11, is a view on line 3—3 of Fig. 2, looking down. Fig. 4, is a detail view on line 4—4 of Figs. 1 and 5, showing the forward support for the piston rod inside the cylinder. Fig. 5, is a view on line 5—5 of Fig. 4. Fig. 6 is a detail view on line 6—6 of Figs. 1 and 7 of the rear support

of the piston rod inside the cylinder. Fig. 7 is a view on line 7—7 of Fig. 6. Fig. 8, is a detail view on line 8—8 of Figs. 1 and 9, of the central support for the piston rod inside the cylinder. Fig. 9 is a view on line 9—9 of Fig. 8.

Similar letters of reference refer to similar parts throughout the several views.

The steam cylinder B of my improved steam feed for sawmills rests on the floor A of a saw mill in the usual way. The piston rod C is connected to the carriage E by means of the bracket D and its attachments. The long steam cylinder with its contained piston head is operated similar to other steam feed cylinders and steam engines by means of an engine valve J connected by pipes P, P, to the ends of the cylinder B.

The end of the piston rod C is turned up and attached to the carriage above so that its lower side can be supported by a series of guides as rollers *b* when it is outside of the cylinder. The upper end of the piston rod is pivoted into the horizontal link K which passes through an opening in the case D and is pivoted on the pin *t* in the bracket D which is bolted on the under side of the saw mill carriage E. The link K is limited in its movement by the set screws *s, s*, in the sides of the bracket D. A spring *v* contained in the case tends to throw the link K to one side so that when the carriage is reversed and offsets the link K instantly accommodates itself to the movement.

Inside the cylinder B are provided three movable supports F, G, and H for the piston rod C. These supports are movable and adapted to support the piston rod during its movement along the cylinder and so obtain the best results.

The movable support H nearest to the piston head is constructed like a movable piston head adapted to shift on the piston rod C and is carried to its place by the spring *y'* on the piston head I engaging the annular groove *y* on the inner portion of the guiding support H. A catch through the bottom of the cylinder held up by the spring *m* engages one of the annular grooves on the outside of the

support H and holds it in place so that the piston rod C passes on through it and is supported by it. A valve *u* is put in the head H to assist in governing its movements in starting and stopping so that it will not slam against the piston head I or support G.

The central support G consists of three anti-friction rollers *j*, equidistant apart around the piston rod C and adapted to it and to the inside of the cylinder B. These rollers are pivoted in a case so that they maintain the same relative positions. This kind of support it will be seen will travel only one half as fast as the piston rod C or the piston head I, owing to the fact that it is moved by the piston rod acting on the top side of one of the rollers, *j*, which comes in contact with the inside of the cylinder carrying it along as the action of a bar passing over a roller, and will consequently always support the piston rod at the center of the portion inside the cylinder no matter how much that may be.

The front support F is made like a hollow piston head with the piston rod C passing through it. On the inside of this guiding cylinder head is a ring *e* having a weight *e'* projecting forward and back on its lower side. On the top of the piston rod C is a notch *h* adapted to engage the ring *e*. As soon as it engages the ring it tips (see dotted lines Fig. 5) and holds the head securely on the rod which carries it along to the place intended. When the motion reverses the ring is held square across the piston rod C and the piston rod C passes through it till the middle support comes against it and carries it back. It is thus clear that when the piston head is forced back to the front of the steam cylinder the very long piston rod C will be thoroughly supported and guided its entire length. This will cause the power applied to the rear to be most effective because the piston rod is held straight and cannot spring to one side and being supported at intervals the friction is materially lessened. These guiding supports inside in combination with the guiding supports for the piston rod outside of the cylinder cause the rod to reciprocate in a straight line without sagging or buckling and consequently without binding and consequent waste of force and wear and tear of the parts which is very considerable otherwise. The attachment to the carriage admits of the carriage having considerable variation in its movement without affecting the piston rod.

I desire to say that in steam feeds requiring a shorter cylinder all of the supports inside the cylinder will not be required and some of them can be dispensed with and on the longer cylinders more of them could be introduced.

My improved steam feed can be considerably varied in its details and still embody my invention; and I desire to say my invention is capable of use wherever long horizontal steam cylinders may be required.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam feed for saw mills the combination with a saw mill carriage of a steam cylinder B, containing a piston head I and piston rod C passing through a stuffing box at the piston head, the bracket D, the link K, the guide rollers *b*, outside the cylinder, and the guiding supports F, G and H inside the cylinder adapted to be distributed along the piston rod inside the cylinder substantially as described for the purpose specified.

2. In a steam feed for saw mills the combination with the piston rod of a horizontal link pivoted to the upper side of the piston rod and to the sawmill carriage, and suitable guides for the under side of the piston rod for the purpose specified.

3. In a direct acting steam feed for sawmills requiring long steam cylinders, the combination of the piston rod with suitable movable supports inside the cylinder, adapted to be carried by the movement of the piston and piston rod to support the piston rod at intervals and to guide the same for the purpose set forth.

4. In a direct acting steam feed for saw mills, the combination of a steam cylinder containing a piston head and piston rod with a suitable movable support and guide for the piston rod inside the cylinder adapted to be moved by the motion of the piston head and rod for the purpose set forth.

5. In a direct acting steam feed for saw mills, the combination of the bracket D attached to the underside of a saw mill carriage, the link K passing through an opening in the side of bracket D and pivoted to the case, and to the end of the piston rod, the adjusting screws *s*, and the spring *v*, substantially as described.

6. In a steam feed for saw mills, the combination with the piston rod of a horizontal link pivoted to the carriage and to the piston rod for the purpose set forth.

7. In a direct acting steam feed for sawmills the combination of the bracket D attached to the sawmill carriage, the link K passing through an opening in the side of the bracket D and pivoted to the bracket and to the piston rod and the adjusting screw *s* on the side of the link for the purpose specified.

8. The combination of a long steam cylinder containing a piston head and piston rod, with a suitable movable support and guide for the piston rod inside the cylinder adapted to be moved by the motion of the piston head and rod for the purpose set forth.

In witness whereof I have hereunto set my hand and seal in the presence of two witnesses.

WILLIAM E. HILL. [L. S.]

Witnesses:

C. E. WESTBROOK,
E. S. ROOS.