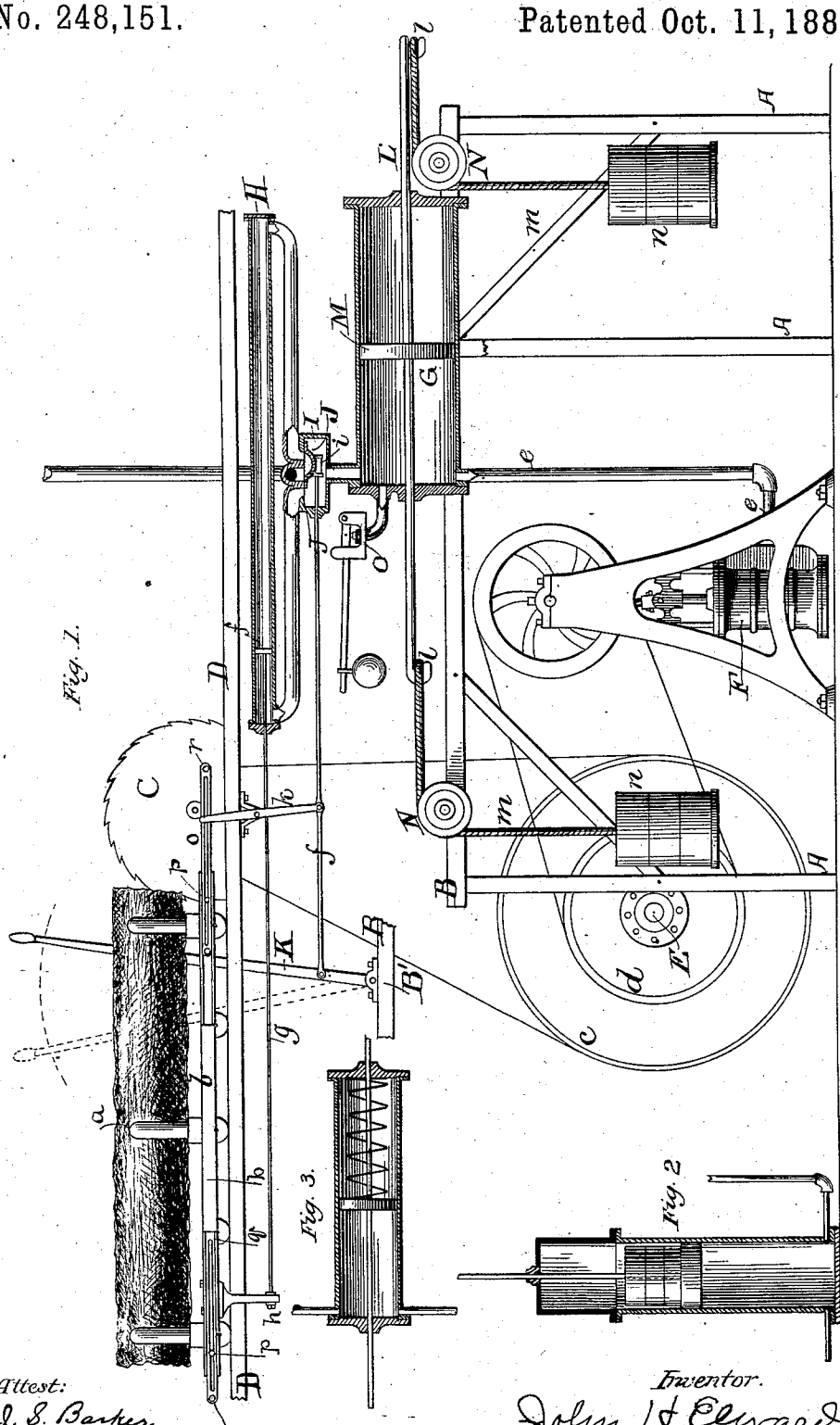
(No Model.)

J. H. ELWARD.

FEED MECHANISM FOR SAW MILLS.

No. 248,151. Patented Oct. 11, 1881.



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FEED MECHANISM FOR SAW-MILLS.

SPECIFICATION forming part of Letters Patent No. 248,151, dated October 11, 1881.

Application filed July 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, a citizen of the United States, residing at the city of Stillwater, in the county of Washington and State of Minnesota, have invented certain new and useful Improvements in Mechanism for Utilizing Cold Air under Pressure for Mechanical Purposes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In saw-mills it has been customary to reciprocate the log-carriages in one or the other of two ways—one being to combine with the carriage a positive mechanism, such as gearing and belting, the other way being by the action of steam operating to drive a piston connected to the carriage.

The devices used for carrying out the first method do not permit any yielding of the carriage, if such yielding should be demanded, when the saw reaches a knot or other obstruction. As a result the machine is often broken or otherwise injured.

To obviate this difficulty the second of the above-mentioned methods has been employed more or less extensively. The piston is connected to the carriage, and is operated by steam in such a manner that the log shall be forced against the saw with a yielding pressure, whereby the carriage, when the saw meets an obstruction, is allowed to be retarded sufficiently to prevent breakage or other injury to the saw and machinery. But much trouble and loss are met with in using this steam feed, and in fact it is impracticable in the ordinary open mills which are used throughout the country, for the reason that there is much condensation of steam in the long pipes that are required, and the resulting water is liable, through a large part of the year, to be frozen in the pipes. Moreover, as the greater portion of such mills are operated by water-power, it is impossible to carry the log-carriage by steam, unless a special steam mechanism is employed for that purpose, which, of course, under most circumstances, is impracticable.

I have devised a mechanism to be operated by compressed air which obviates the difficulties which have been met with in using steam, and at the same time retains the advantages incident to a yielding or elastic agent.

Figure 1 is a view of so much of the machinery of a saw-mill as is sufficient to illustrate the first part of my invention, the setting mechanism being removed. Figs. 2 and 3 show modified forms of the air-receiver.

It will be understood that the mechanism to be hereinafter described may be combined with the sawing devices used in any mill of the ordinary construction. Portions of the frame-work of the mill are represented at A A A, which designate uprights, and B B, which indicate sills or joists. Upon the frame-work thus partially represented, and upon the other portions not shown, the saw C is mounted and the carriage-track D is supported.

The carriage may, with the exception of the minor details to be hereinafter noticed, be of the ordinary or any preferred character. As shown, it is provided with rollers, and with head-blocks *a*, supported upon a frame having side pieces, *b*, and end and intermediate pieces.

The main shaft is represented at E, and upon it are the wheels *c* and *d*—the one for operating the saw, and the other for actuating the pump at F. This pump may be of any of the styles commonly used for forcing or compressing air, and therefore need not be described in detail. The air that is discharged from the pump is carried through suitable pipes, *e e*, to the receiver or reservoir G, from which it is conducted to the cylinder H. Within the cylinder is fitted the piston-head *f*, the rod *g* of which is connected to the log-carriage by means of an arm, *h*. Air passes from the receiver or reservoir G to the cylinder H through the valve-chest I and the ports J J, communicating, respectively, with the ends of the cylinder. The valve *i* can be moved back and forth by means of the rod *j* and the hand-lever K or the lever *k*.

L is a long piston rod or shaft passing entirely through the receiver or reservoir G, it being mounted therein by suitable stuffing-boxes.

M is a piston attached to the rod L within

the receiver or reservoir, and fitted tightly therein. Hooks or curved arms *l* are formed upon or attached to the ends of the rod L, and by means thereof ropes *m m* are secured to the rod. Chains may be used instead of ropes. The ropes are supported upon and run over pulleys N, and their lower ends carry weights *n n*. By means of these weights, the number of which may be increased or decreased, as desired, any amount of pressure may be attained. As the pump fills the receiver the piston is shoved back and the weights are raised, and as the air is drawn from the receiver to the cylinder the weights will descend, bringing forward the piston M, and thus preserve a uniform pressure as the log is being gigged back. When the carriage is standing still for any purpose, the pump continues to run, and the weights *n n* are hoisted, and thus the cylinder is filled with air under the required pressure.

At O there is a safety-valve, from which the air can escape when the pressure in the receiver becomes greater than is required.

The log-carriage can be stopped at any desired point by shifting the hand-lever K into the proper position to bring the valve *i* into the proper place where it will close both of the ports J J, and the carriage can be held at this point as long as desired.

By means of the lever *k* the valve *i* can be shifted automatically, so that the carriage can be caused to move forward and back without the intervention of the operator. For this purpose adjustable sliding bars *o* are attached to the sides of the carriage, at the front and rear ends. They are secured in place by set-screws *p p*, passing through slots in the arms *o*, and engaging with the plates *q*. Each arm carries a pin, *r*, situated so as to engage with the lever *k* and swing the forward end of said lever forward or back. When the front pin, *r*, engages with the lever, the valve *i* is moved in such manner that the air bears against the piston to draw the carriage toward the saw. When the rear pin engages with the lever, the valve is shifted into the opposite position, so that the air bears against the other side of the piston F, to thrust the carriage away from the saw.

It will be seen that by means of the devices the carriage can cause itself to reciprocate for an indefinite time, and may be set to stop at the right points for any length of log. Moreover, if desired, with one or the other of these pins may be combined mechanism for setting the log over on the carriage. When so arranged the parts can co-operate to produce all the necessary movements of the log until it is cut into the required number of pieces without the presence of any attendant whatever.

The air receiver or reservoir G may be varied in character without materially altering its relations to the other parts. Thus in Figs. 2 and 3 I have shown two of the various forms that may be used. In the construction shown in Fig. 3 the weights are dispensed with, and one or more springs, *n*, are substituted. In that shown in Fig. 2 a vertical cylinder is employed, and the weights are placed therein above the piston M. Other modifications will readily suggest themselves to those acquainted with the construction and operation of such devices.

A mechanism of this character obviates the serious difficulties met with in the use of steam for moving the carriage, as there is no water to be deposited in the pipes, and therefore the latter cannot be injured or rendered inoperative by freezing. Moreover, in mills operated by water-power this mechanism is of great value, as it can be used to store up power in the intervals when the saw is not being used.

What I claim is—

1. The combination, with a reciprocating carriage having a long travel, and an air-cylinder correspondingly long, of a main power-shaft, E, an air-compressing mechanism, and an air-reservoir arranged between the compressor and the cylinder, and adapted to store up air against a yielding pressure, substantially as set forth.

2. In a saw-mill, the combination, with the reciprocating log-carriage, the saw, the devices which operate the saw, and the air-compressor, of the air receiver, provided with a shaft running longitudinally through the ends of said receiver, and provided with adjustable weights, substantially as set forth.

3. The combination, with the reciprocating carriage, the air-cylinder, the valve-chest, the valve, and the valve-rod, of the adjustable projections *r* and the lever *k*, as and for the purposes set forth.

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

JOHN H. ELWARD.

Witnesses:

J. R. GAGE,

AUG. F. SANFTENBERG.