(No Model.)

E. F. MILLARD.

PRESSURE FEEDER FOR PULP GRINDERS.

No. 298,875. Patented May 20, 1884.

Fig. 1.

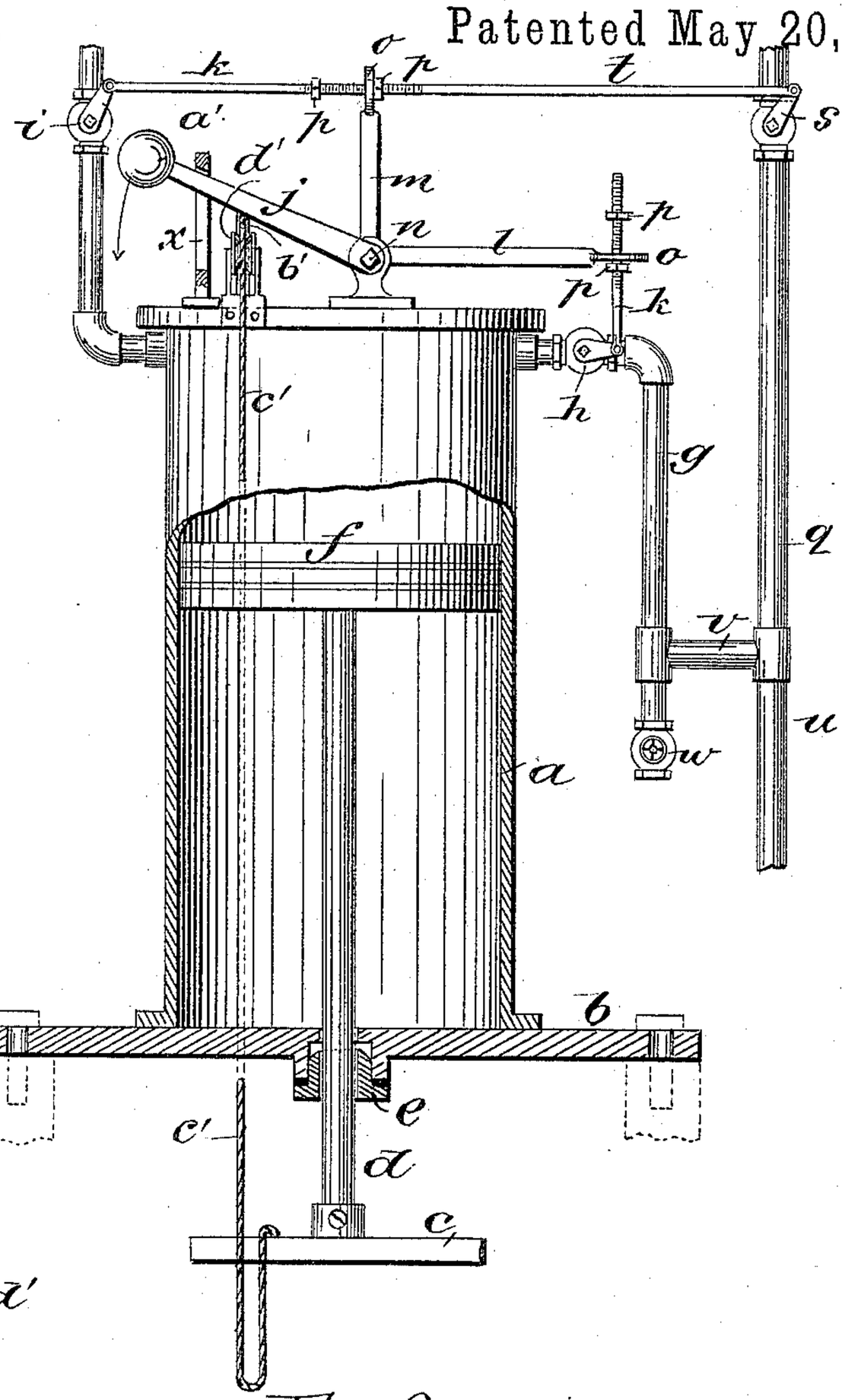


Fig. 3.

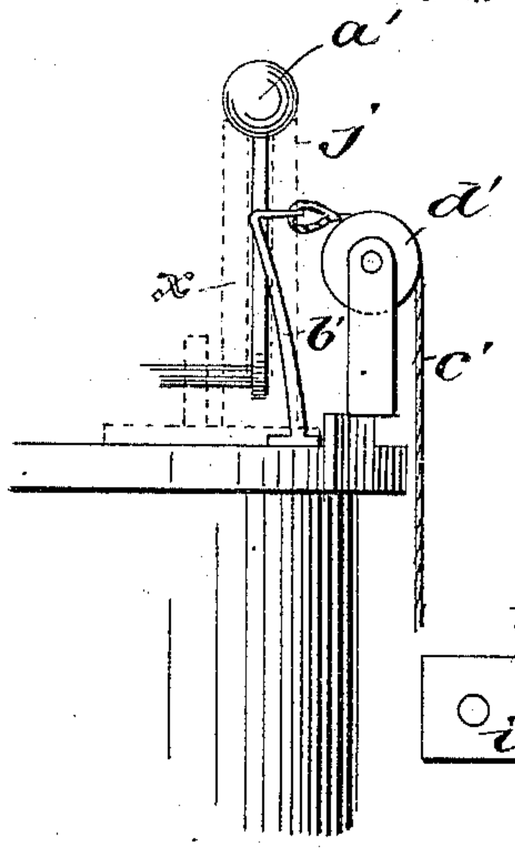
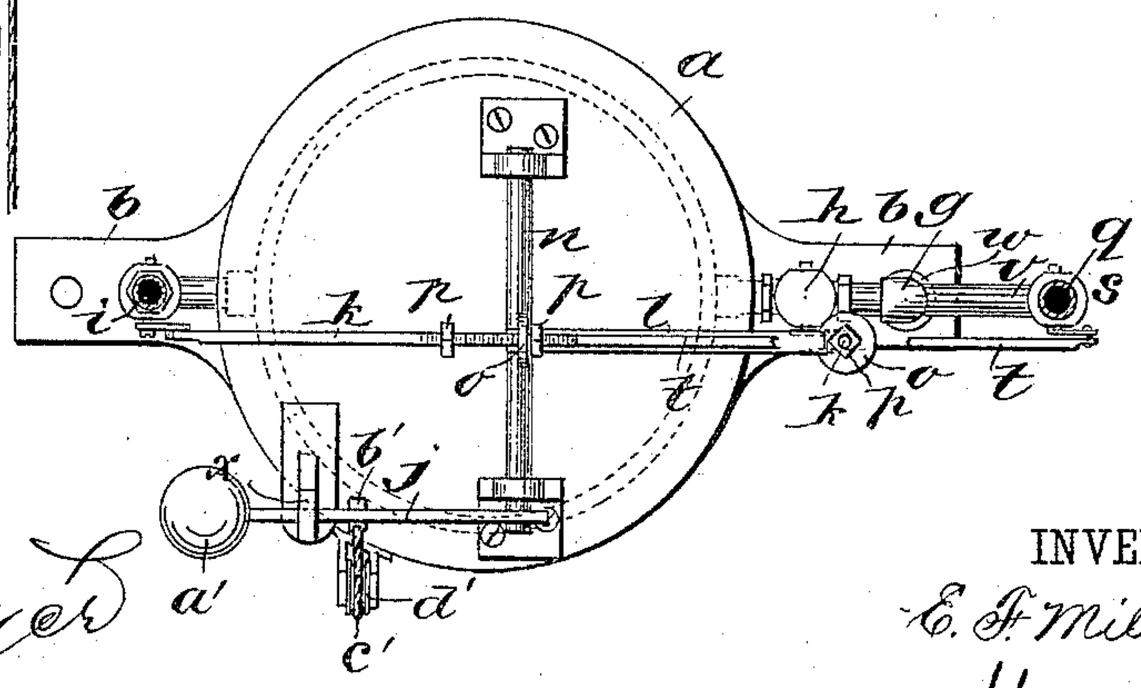


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD F. MILLARD, OF MARINETTE, WISCONSIN.

PRESSURE-FEEDER FOR PULP-GRINDERS.

SPECIFICATION forming part of Letters Patent No. 298,875, dated May 20, 1884.

Application filed October 22, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. MILLARD, of Marinette, Marinette county, Wisconsin, have invented a new and Improved Feeder for Pulp-Grinders, of which the following is a full, clear, and exact description.

My invention consists of a steam or water pressure feeder or presser for supplying the wood to pulp-grinding stones, contrived for raising or withdrawing the piston when the wood blocks are ground up, by suction or by a vacuum produced in the cylinder behind the piston, to avoid the use of pressure under the piston for returning the piston, and thus avoid the use of packing and save the time and labor of keeping the piston-rod packing in order, which is a difficult matter in these machines, in which the packing is rapidly destroyed.

My invention also consists of an improved contrivance of the valve-shifting lever, designed to effect the shifting of the valves by quick thrusts or blows to start them more readily than they will by the slow movements due to the swing of the lever, as hereinafter fully described.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is partly a side elevation and partly a sectional elevation of my improved pressure-feeder. Fig. 2 is a plan view, and Fig. 3 is a detail view.

The pressure-cylinder *a* is preferably arranged upright on any suitable support, *b*, to press the wood downward on the top of the grindstone, (not shown,) by the water or steam pressure acting through the piston and the cross-head *c*, attached to the lower end of the piston-rod *d;* but the cylinder may of course be arranged horizontally or obliquely. The vertical arrangement is, however, the best for some reasons; but it is difficult to get at the stuffing-box *e* of the piston-rod for maintaining water or steam tight packing for enabling water or steam to be used to raise the piston *f* when the blocks of wood are ground up and others are to be put in. Moreover, the lateral stress of the grindstone on the piston-rod has the effect of slacking off the packing on one side of the rod, so that at the best it is very difficult to maintain steam-tight piston-rod packing in the steam or water pressure feeders. I therefore construct the box at *e* to be used merely as a bearing to the rod *d* without packing, and to raise the piston by means of suction, to be created above the piston by the water-column of the exhaust-pipe *g* when water is used, or by a vacuum produced in the exhaust-pipe *g* by a steam-jet from the steam-pipe *q* when steam is used.

For operating the valves, the valve-rods *k* are connected to the arms *l m*, respectively, of the rock-shaft *n*, by extending loosely through the perforated end plates, *o*, of said arms, with stop-nuts *p*, screwed on the valve-rods each side of the arm-plates *o*, to allow of some play of the arms between the stop-nuts, which enables the valves to be actuated quickly, as by a blow, instead of the slower movements they would have if connected to the rocker arms without slack between the stop-nuts, thus starting the valves better and more certainly.

By dispensing with the packing in the piston-rod stuffing-box, the water leaking through the piston or condensing from steam escaping through the same is free to escape without attention, whereas when steam is used to raise the piston care must always be taken to close the petcock, that must in that case be used, when steam is admitted to raise the piston, and the said cock must be opened again when steam is admitted above the piston for feeding the wood.

The valve *s* of the steam-jet pipe *q* is connected by rod *t* with the rod *k* of the steam-valve *i*, when steam is used, to open the said valve *s* simultaneously with the closing of the steam-valve *i*, and vice versa.

When steam is used and the nozzle *u* is employed for producing the suction by a steam-jet, the nozzle may be connected to the exhaust-pipe *g* by a branch, *v*, and the exhaust-pipe may have a cock, *w*, to close it below the branch *v*.

I prefer to simultaneously move the valves by a lever, *j*, fixed to rock-shaft *n*, and working in or along a guide and stop plate, *x*, fixed to the cylinder-head; and I propose to have a spring, *b'*, to hold the lever up when the press-

ure is on with a cord, c', attached to the spring, and passing over a guide-pulley, d', to the cross-head c, to withdraw the spring and trip the lever when the cross-head arrives at the lowest point of its descent, and I will have a weight, a', on the lever to cause it to act quickly and automatically. I propose to use air as well as water or steam for applying the pressure.

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

1. In a water or steam pressure feed apparatus for pulp-grinders, the cylinder provided with means for raising or returning the piston by suction on the exhaust side, and the piston-rod having a bearing only, without packing, in the box e, secured within a tubular boss on the under side of the support b, below the cylinder, substantially as described.

2. In a steam-pressure feed apparatus for pulp-grinders, the exhaust-pipe g, provided with a steam-jet pipe, q, for producing suction on the exhaust side of the piston, for raising or returning the same, substantially as described.

3. The lever-arms l m, connected to the valve-rods k, between stop-nuts p, allowing play of the arms for starting the valves with a blow, substantially as described.

EDWARD F. MILLARD.

Witnesses:
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