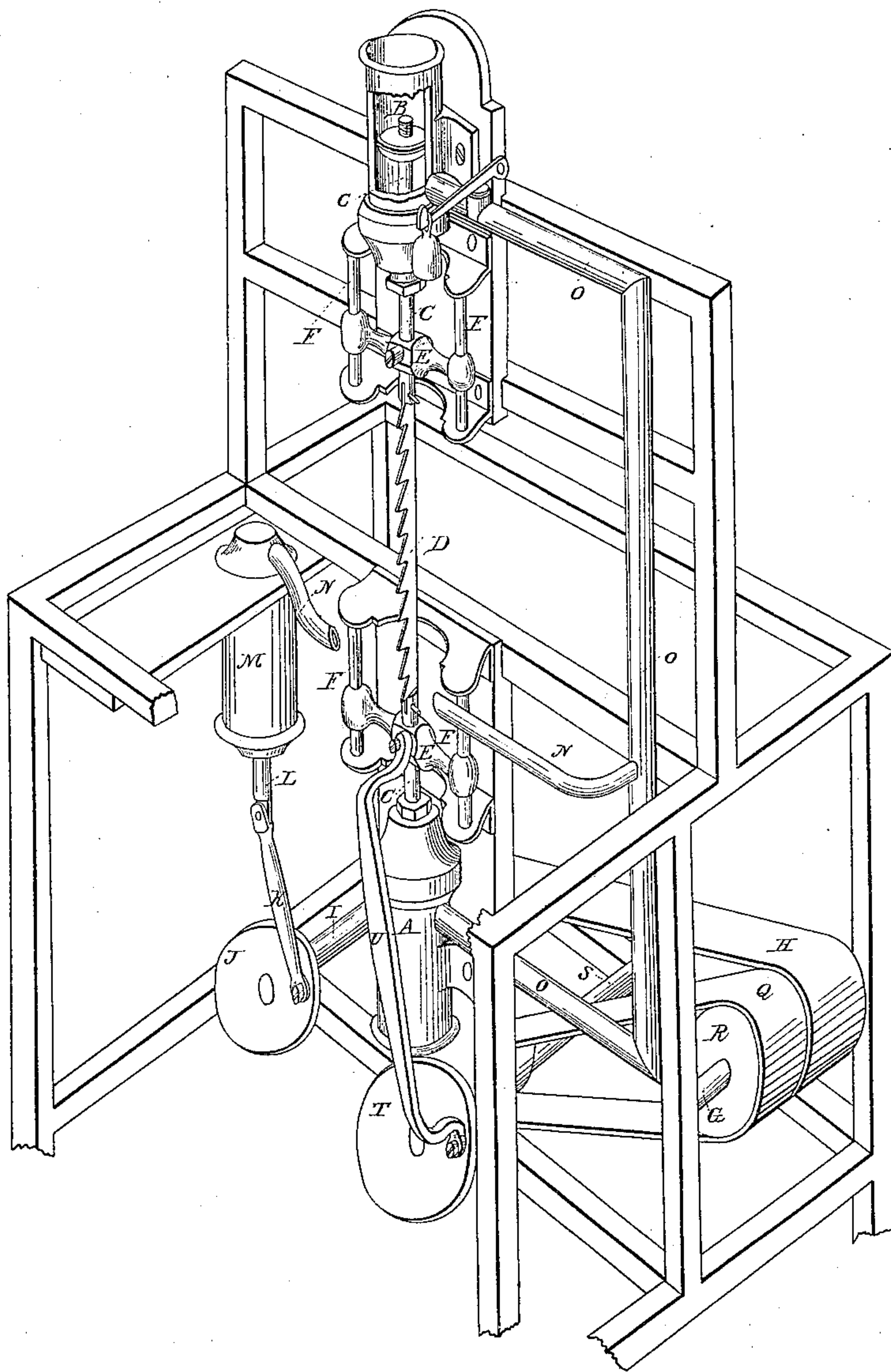


*Rapp & Wright,
Reciprocating Saw Mill,*

No 9,889,

Patented July 26, 1853.



UNITED STATES PATENT OFFICE.

JACKSON A. RAPP AND EDWARD S. WRIGHT, OF BUFFALO, NEW YORK.

STRAINING SAWS BY COMPRESSED AIR.

Specification of Letters Patent No. 9,889, dated July 26, 1853.

To all whom it may concern:

Be it known that we, JACKSON A. RAPP and EDWARD S. WRIGHT, both of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in the Method of Straining Saws Without a Gate; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, making a part thereof, and which represents a perspective view of the entire apparatus.

The nature of our invention consists in the application of compressed air, so applied to piston heads working in cylinders at each end of the saw, and to which heads the saw is connected by its ends, by rods, as that the tendency of the compressed air to push or pull apart the piston heads, shall be exerted to the straining of the saw, and thus keep it perfectly strained without the use of a gate or saw frame.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same with reference to the drawings.

We place two cylinders in a direct vertical line with each other, one of which A, is below the table or floor of the mill, and the other B, is suspended from above the table at any suitable distance. These two cylinders are provided with piston rods C, each having a piston head, with suitable packing, working in said cylinder. The saw D, is connected at its ends, to each of the piston rods C, in any suitable manner, and these rods at the ends of the cylinders next the saw work through stuffing boxes—the other ends viz: The top of the upper one and the bottom of the lower one may be left open. The packing, for the piston heads, which we find in practice to answer a good purpose is a simple leather disk, clamped between two concave iron plates—the leather extending slightly beyond the peripheries of the iron disks, as seen in the top cylinder B, a portion of which is represented as broken away for the purpose of showing the packing. A cross head E, is attached to each end of the saw, and suitable guide rods F, for them to slide upon, as the saw vibrates.

Power, either steam, water, or any other kind, may be applied through the shaft G, which carries two pulleys, over one of which passes the endless band H, and thence to

a pulley or drum on the shaft I, to the end of which shaft is attached a wheel J, and to this wheel J, by a wrist pin or otherwise is attached the connecting rod K, the other end of said connecting rod being hinged to the lower end of the piston rod L, of the air pump M, and by which arrangement of parts the air pump is worked—its piston head and packing being similar to that used in the cylinders A B. From the top of the air pump, a pipe or tube N, leads to, and connects with the pipe O, which connects the two ends of the cylinders, nearest to each other, together, that is, so that the air shall be forced into the cylinder between the piston heads and the packed or tight end of the cylinders, and exert itself in forcing apart the piston heads. But the piston heads being connected together by the saw, this force exerts itself in straining up the saw. A safety valve P of any of the ordinary well known constructions, is arranged on the pipe O, so as to allow the excess of air to escape. There is no escape of air, except by leakage, consequently no valves to operate or chambers to empty. The air pump keeps up the supply, and as the piston head in either cylinder approaches the mouth of the inlet pipe it drives the compressed air before it down or up into the other cylinder as the case may be, where the other piston head is receding from the inlet pipe and making room to receive it, and it thus travels by the action of the pistons from one cylinder to the other. If it were possible to make the cylinder and packing perfectly air tight without too much friction—the chambers and pipes once filled with air, would continue for an indefinite period to keep the saw strained, but as this is not practical, the air pump is used to start and supply the air. It is found advisable also, to have the air pump so arranged that it can be operated independently of the saw. As it will be found necessary sometimes to strain up the saw, before the mill is ready to start, or at least before the feed is put on.

The belt Q, passes around the pulley R, on the shaft G, and thence around another pulley on the shaft S, which carries the wheel T, to which by a wrist pin is connected the pitman U—the other end of said pitman being attached to the lower cross head, and through these several parts, the saw is vibrated.

Instead of using the direct action of the compressed air for straining the saw, as above described, it may be done by creating a vacuum in the cylinders, in which case the
5 connecting pipe which connects the two cylinders, should be placed at the other ends of the cylinders, and the power of the air pump be used to exhaust the air from the cylinders—the effect would be essentially the
10 same, for in one case the air is forced in to produce the effect, and in the other case is forced out to produce the same effect.

The advantages of a saw strained without a gate or saw frame are numerous—a thinner saw can be used, requiring less power to
15 drive it, and saving in size of the kerf; it can be run at three or four times the velocity of a saw in a gate, with perfect safety, and at such speed as would shake or jar a heavy
20 gate to pieces; it leaves the table or floor of the mill unincumbered by the frame posts, and for circular sawing allows the board to be turned in any direction.

We are aware that attempts have been
25 made to use steam for straining saws, which thus far is found impracticable, for in mills driven by any other power than steam, a boiler and other suitable apparatus, involving the use of slide valves, steam chambers,
30 metallic packing, &c., have to be procured, which are in themselves expensive, and require as much care and attention as a regu-

lar steam engine. Besides the condensation of the steam in the cylinders, has heretofore made this operation so uncertain, as to make
35 their use of doubtful utility. But the greatest objection found in the practical use of steam for this purpose, arises from the fact that, the leakage or dripping from the cylinder, falls immediately upon the saw,
40 soon corroding it, and rendering it of no avail. Our invention entirely overcomes every one of these objections. It is cheap, simple, perfectly safe, and entirely effective as several months' usage has proven, and
45 within the reach of every one whether his power be steam, water, or any other.

What we claim as our invention and desire to secure by Letters Patent is—

The application of compressed air to the
50 straining cylinders of saws, when said cylinders are so connected with each other that the compressed air shall alternately pass from one cylinder to the other, during the reciprocating action of the saw, and com-
55 bined with the air pump and pressure valve for the purpose of regulating and maintaining the intensity of the strain on the saw, substantially in the manner described.

JACKSON A. RAPP.

EDWARD S. WRIGHT.

Witnesses:

WM. M. STOUN,

FRED GARDNER.