

(No Model.)

2 Sheets—Sheet 1.

J. B. RHODES.
SAW GRINDING MACHINE.

No. 504,404.

Patented Sept. 5, 1893.

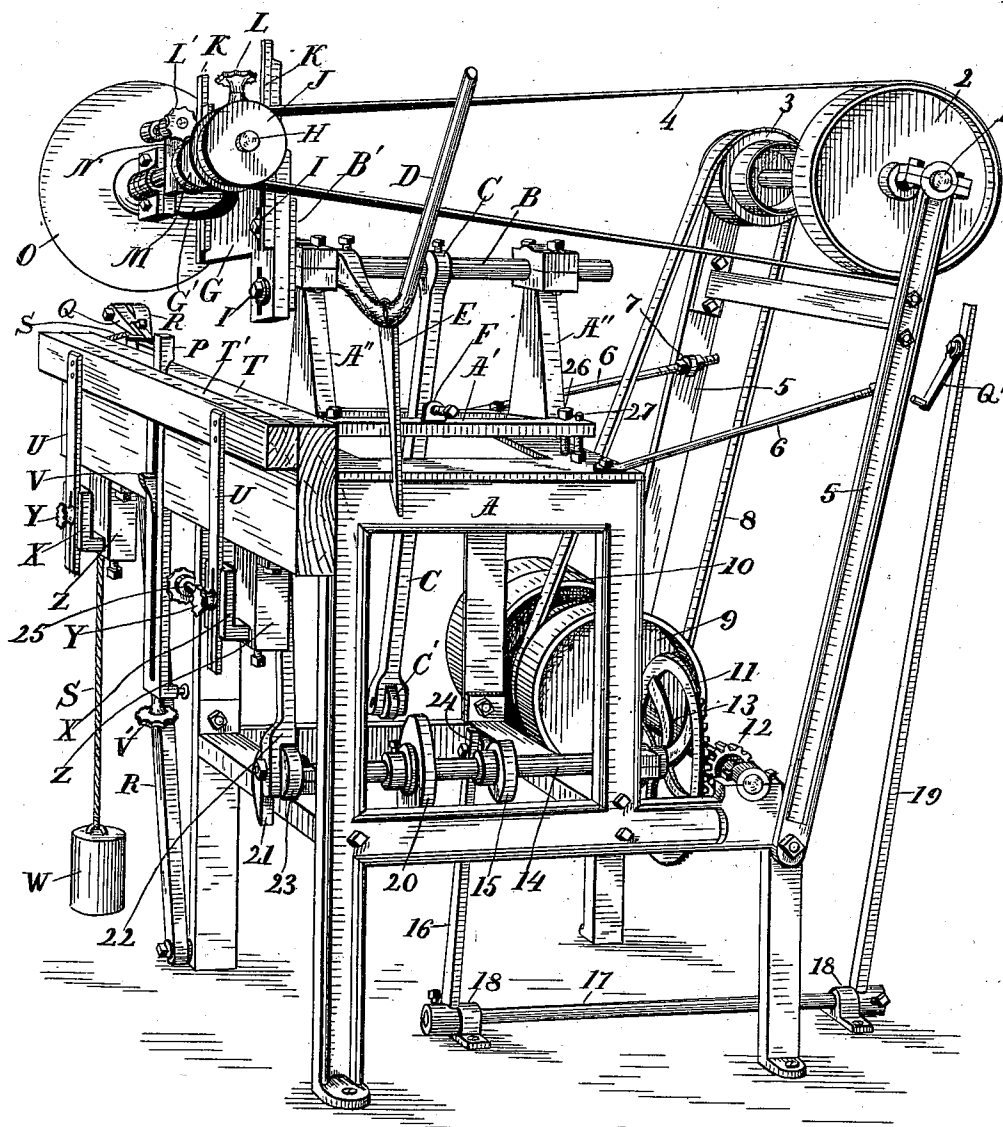


Fig. 1.

WITNESSES:

INVENTOR

Luther V. Moulton
Lois Moulton.

James B. Rhodes
BY
Dennis L. Rogers,
ATTORNEY.

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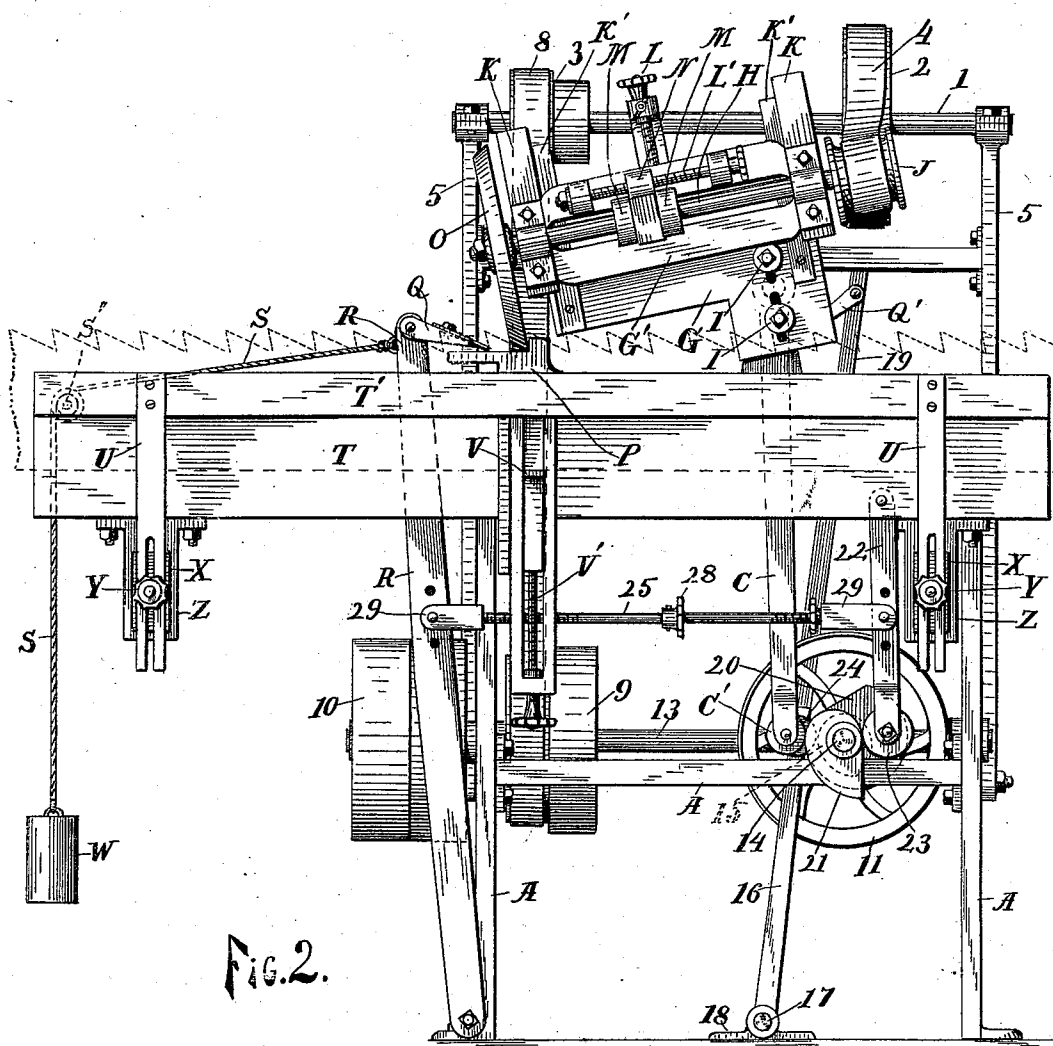


FIG. 2.

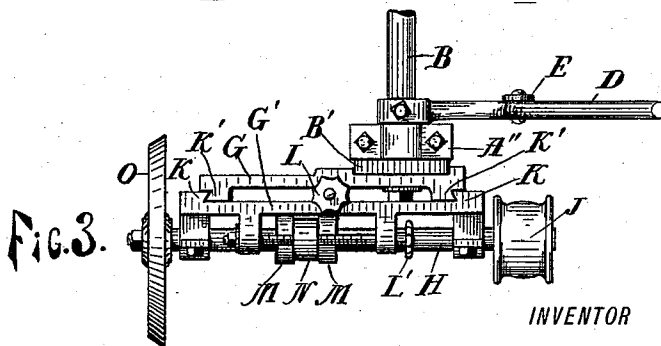


FIG. 3.

WITNESSES:

Luther V. Moulton
L. Moulton

INVENTOR

James B. Rhodes

BY

Dennis L. Rogers
ATTORNEY.

UNITED STATES PATENT OFFICE.

JAMES B. RHODES, OF GRAND RAPIDS, MICHIGAN.

SAW-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 504,404, dated September 5, 1893.

Application filed May 16, 1892. Serial No. 433,212. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. RHODES, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Saw-Grinding Machines; 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.

My invention relates to a saw grinding machine.

My object is to construct a machine for grindingsaws, adapted more especially to upright, and band mill saws, and having certain peculiar parts, constructed and arranged in such a manner as to produce an effective machine, and consists in the construction, combination, and arrangement of the various parts hereinafter described and particularly pointed out in the claims reference being had to the accompanying drawings, wherein—

Figure 1. is a perspective of a device embodying my invention; Fig. 2. a front elevation of the same and Fig. 3. plan detail of the arbor, yoke, bed plate and attachments.

A. represents the main frame of the machine, which is preferably of iron and firmly secured to the floor, and has a rearwardly projecting lower portion, to form a convenient seating for the driving shaft 13 on which are tight and loose pulleys 10 for the driving belt, and cone pulley 9. for the countershaft belt 8. engaging the cone pulley 3. on the countershaft 1. which has the pulley 2. and is journaled in suitable boxes at the ends of the arms 5. pivoted at their lower ends to the frame A. and adjustable by nuts 7. on the outer ends of braces 5. having their inner ends secured to frame A.

Mounted upon frame A. is the table A'. having binding screws 26. and adjusting screws 27. and on which are mounted the upright hangers A''. for the rock shaft B. journaled thereon in suitable boxes and having the T-head B', which is seated in an adjustable bed plate G. having slots, in which are the bolts I. by which it is adjustably attached to the T-head. Firmly secured to and depending from said rock shaft B. is an arm C. provided with an adjusting screw F. for limiting its

movement; and having the roll C'. journaled in its forked lower end, for engaging the cam 20. on the shaft 14. for oscillating said rock shaft. Mounted on said bed plate G. is a yoke G'. having dovetail ways K. engaging corresponding dovetail grooves K'. on the bed plate, and having the arbor H. journaled thereon at right angles to said rock shaft, carrying the grinding wheel O. and having collars M. M. and pulley J. and provided with the adjusting screw L', journaled on the yoke and engaging the block N. between the collars M. for longitudinal adjustment of said grinding wheel. The yoke G'. is vertically movable and adjustable by the screw L, mounted on the bed plate G. and engaging said yoke G', in the usual manner.

Attached to the front portion of the frame is the heavy timber T. placed horizontally underneath the arbor H.: and arranged parallel to and nearly in contact therewith is the timber T'. supported and held in position by flat springs U. U. slotted for vertical adjustment at their lower ends, and held by binding screws Y. Y. engaging angle irons X. X. secured to pendent hangers Z. Z. secured to the under side of timber T.: the two timbers so placed, forming a clamp, between which the saw is placed, and in which it is movable longitudinally; its position being indicated in dotted outline in Fig. 2, the back resting upon a support V. adjustable by means of the screw V'. and is shifted or fed forward, for bringing the teeth successively under the grinding wheel, by pawl Q. pivoted to the upper end of lever R. having its lower end pivoted to the frame A. and operated by cam 21. on the cam shaft 14. engaging wheel 23. on the lower end of pivoted lever 22. connected to lever R. by the rod 25. having yokes 29. attached to said levers R. and 22. respectively, and threaded ends engaging threads on the ends of the yokes and milled wheel 28 for turning the same, whereby the movement of the lever R may be regulated for adjusting the movement of the pawl Q. The length of the stroke may also be adjusted by means of the shifting of the rod 25 provided for by the holes seen in levers R and 22. and the pawl Q. is retracted by the weight W, connected to lever R by cord S. (or a spring may be used for this purpose if preferred).

For handling band saws I provide an additional pawl Q' which co-operates with pawl Q., is placed upon the opposite side of the machine and pivoted to an upright lever 19, having its lower end secured to a rock shaft 17 journaled in bearings 18 secured to the floor and operated by cam 15 engaging roll 24. in the end of lever 16. and adjusted to co-operate with the other feeding pawl in shifting the saw. The stop P. on the timber T. is for limiting the forward movement of the pawl Q. and the grinding wheel is lifted out of engagement with the saw by bent lever D attached to the rock shaft B and held by latch E engaging frame A. The bevel gears 11 and 12 connect the driving shaft 13 to the cam shaft 14: and the belt 4 connects the arbor pulley J to the pulley 2 on the counter shaft as shown in Fig. 1. It will now be observed that the arbor H. carrying the grinding wheel O. is arranged at right angles to the rock shaft B.: that it is journaled in bearings carried on the rock shaft arranged at a distance above the rock shaft equal to about one half the diameter of the wheel, and that the arbor vibrates in unison with the rock shaft. In other words that the bearings of the grinding disk arbor are oscillated in the arc of a circle, of which the rock shaft is the center: and consequently the inclination of the beveled or inclined edge of the grinding wheel or disk in relation to the saw teeth, changes from the throat thereof, to the point or cutting edge.

Having thus described my invention, a brief description of its operation is as follows: Power, applied to the driving shaft, from any convenient source, causing it to revolve, the motion is communicated to the counter shaft 1. and from thence to the arbor H. by the belts 8. and 4. and to the cam shaft 14. by gears 12. and 13. The saw being in the position shown in Fig. 2. the grinding wheel O. revolving rapidly, grinds any portion of the tooth, with which it is in contact; cam 20 engaging lever C. turns rock shaft B. and raises the wheel slowly in the direction already described. At the same time pawls Q. and Q'. having engaged saw teeth, are pushed forward by their respective levers operated by the cams 21, and 15. and the saw is moved longitudinally and the tooth pushed forward underneath, and kept in contact with the wheel as it rises, until the point is reached: the shape of the cams is indicated by the drawings and is such, and their relation to each other, and to the parts they respectively operate, is such, that, when the wheel has reached the point of the tooth, the wheel rises high enough to permit the tooth to pass underneath its lower edge, when it drops into the next notch, and engages the next tooth; the pawls meantime, engaging the next tooth; and the operation proceeds as before until all the teeth are ground as already explained. The pawl Q. need not be in gear except for grinding band-saws.

The various adjustments for adapting the machine to various sizes of saws, will be readily understood from the foregoing description and inspection of the drawings.

By means of the adjusting screws L and L' I can place the wheel, so as to grind any part, of the tooth, that may be desired.

I claim—

1. The combination of the grinding wheel, and its arbor, having bearings carried on the end of the rock shaft, with the frame, and rock shaft; the latter adjusted to communicate a reciprocating movement to said bearings, whereby said grinding wheel is reciprocated in the arc of a circle of which said rock shaft is the center substantially as set forth.
2. The combination of the grinding wheel and its arbor having bearings arranged at right angles to and carried on the end of the rock shaft, and a means of longitudinal adjustment, with the frame and rock shaft; the latter adjusted to communicate a reciprocating movement to said bearings, substantially as and for the purposes set forth.
3. In a saw grinding machine, the combination of the main frame, a rock shaft journaled thereon and a grinding wheel and its arbor, the latter journaled in bearings carried on the rock shaft, and the lever D secured to the rock shaft and having the latch E, arranged substantially as described and for the purposes set forth.
4. In a saw grinding machine and in combination with a main frame, a rock shaft journaled thereon having a T head, an arbor having a grinding wheel journaled in adjustable bearings secured to said T head arranged at a distance above said rock shaft equal to about one half the diameter of the wheel substantially as and for the purposes herein set forth.
5. In a saw grinding machine and in combination with a main frame, a rock shaft journaled in adjustable bearings mounted thereon, having a T head, a bed plate adjustably secured to said head, a yoke movable in ways on said bed plate and an arbor having a wheel journaled in suitable bearings on said yoke arranged at a distance above said rock shaft equal to about one half the diameter of said wheel substantially as described and for the purposes set forth.
6. In a saw grinding machine, and in combination with a main frame A. having a table A'. mounted thereon, provided with adjusting screws 27. and binding screws 26. and having upright hangers A''. mounted thereon, a rock shaft B. journaled on said hangers and having a T head B'. and provided with an arm C. for oscillating the same, a bed plate G. adjustably secured to said T head, a yoke G'. mounted on said bed plate, an arbor H. journaled on said yoke provided with an adjusting screw L'. and carrying a grinding wheel O. arranged substantially as described and for the purposes set forth.
7. In a saw grinding machine, and in com-

bination with a main frame A. having a cam shaft 14. journaled thereon carrying a cam 21. a pendent lever 22. pivoted to said frame and engaging said cam. a pivoted lever R. carrying a pawl Q. and provided with a retracting weight W. connected thereto by a cord S. and connected to said lever 22. by adjustable rod 25, all arranged as described, a rock shaft B. journaled on said frame, and having an arm C. engaging a cam 20. on said rock shaft and a T head B'. and an arbor carrying a grinding wheel journaled in adjustable bearings adjustably secured to said T head, all arranged substantially as described and for the purposes set forth.

8. In a saw grinding machine, and in combination with a main frame A. having a cam shaft 14. journaled thereon carrying cams 15. and 21. pivoted levers 22. and 15. engaging said cams, pawls Q and Q'. connected to levers 22. and 15. by lever R. and rod 22. and lever 19. and rock shaft 17. respectively clamp jaw T. secured to said main frame and jaw T'. mounted on spring supports U. adjustable support V. arranged as described—the rock shaft B. journaled in said frame and having arm C. engaging cam 20. on said shaft and T head B'. and the arbor H carrying wheel O. journaled in adjustable bearings secured to said T head, all arranged substantially as described and for the purpose set forth.

9. In a saw grinding machine the combination of the main frame, with a rock shaft journaled thereon, having an arm for rocking the same, and a grinding wheel and its arbor; the latter journaled in bearings carried on the rock shaft and oscillated in the arc of a circle

of which the rock shaft is the center, substantially as set forth.

10. In a saw grinding machine, the combination of the main frame with a rock shaft journaled thereon, having an arm for rocking the same and a grinding wheel and its arbor in the latter, longitudinally adjustable and journaled in bearings carried on the rock shaft and rotating simultaneously therewith substantially as set forth.

11. In a saw grinding machine, the combination of the main frame, with a rock shaft journaled horizontally in bearings mounted thereon, and having an arm for rocking the same, and a grinding wheel and its arbor the latter longitudinally and vertically adjustable and mounted in bearings carried on and moving in unison with said rock shaft, substantially as set forth.

12. In a saw grinding machine, the combination of the main frame, with a rock shaft journaled horizontally, in vertically adjustable bearings mounted thereon, and having an arm for rocking the same and a lever for holding the same out of engagement with its cam, and a grinding wheel and its arbor, the latter longitudinally adjustable and journaled in vertically adjustable bearings carried on and moving in unison with said rock shaft substantially as set forth.

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

JAMES B. RHODES.

Witnesses:

DENNIS L. ROGERS,
LOIS MOULTON.