

speed allowance must be made for "slip." The strength of the best ox-hide belts used for belting has been calculated at about 3.086 lbs. per square inch of section. This is reduced at a riveted joint to 1.747 lb., and to .960 lb. at a laced joint. One third of these figures may be given as a safe working tension.

As driving belts necessarily vary considerably, the following table, in pounds per inch width of safe working tension, may be of use:—

Thickness of Belt.	Working Tension.	Thickness of Belt.	Working Tension.
in.	lb.	in.	lb.
3/16	60	1/2	160
7/32	70	9/16	180
1/4	80	5/8	200
5/16	100	11/16	220
3/8	120	3/4	240
7/16	140		

For driving woodworking machinery belts should be used about one-third wider than is found necessary in machines running at a slow speed; they should be of uniform thickness, and kept as pliable as possible. After repeated experiments, we can recommend that driving belts should be run with their outside or smooth surface to the pulley, which is directly contrary to the practice now usually pursued, it being the custom to run the rough or flesh side of the belt on the pulley. It will be found that if a belt is evenly made, and smooth on its face, it bears equally over the whole face of the pulley, and not at certain points, as in the rough surface of the flesh side of the leather. With the smooth surfaces of the belt and pulley coming together the air is almost entirely excluded, and the "grip" or driving power of the belt is thus considerably increased.

Twisted belts should be avoided as much as possible; but if it is found necessary to connect by belt shafts that are not parallel, care must be taken that the belt is always in the plane of rotation of the pulley to which it is approaching, without regard to the retiring side, which may be deviated from that plane without affecting the belt. If this rule is borne in mind, little trouble by belts running off the pulleys will be experienced. When belts are required of greater width than 9 in., a double belt is preferable to a single one, and will run truer. As regards joining belts, many still pursue the old plan of lacing; we have found the double T belt fasteners expeditious and economical, especially for narrow belts, where the tensile strength is not great.

Very considerable trouble is often experienced in saw-mills in keeping the bearings and loose pulleys of the higher speeded machines in order, the friction and strain being in some cases excessive. They should, in the first place, be made of certain proportions; but no hard-and-fast rule can be laid down, owing to the varying and special conditions under which they are employed, and practical experience can be the only guide. Very great care should be taken in fitting them accurately to their various spindles, and when the strains are very great, they should be made of phosphor bronze.

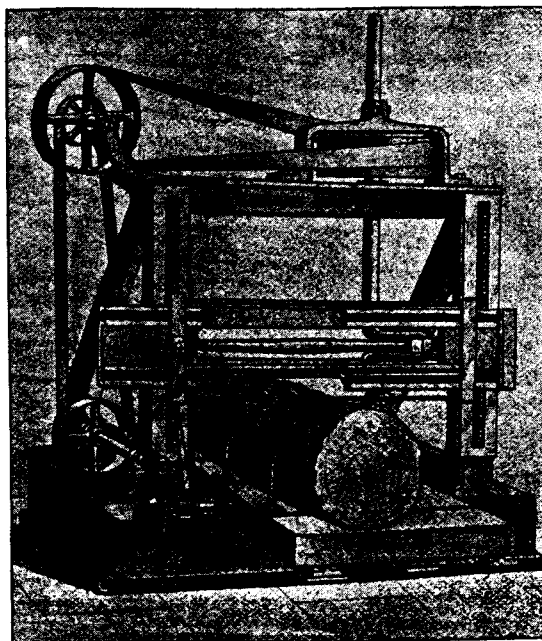
Should the bearings "fire" or "seize," they should be removed and the faces let closer together, the whole of the abrasions being removed by a scraper; the bearings should then be accurately re-bedded on the spindle by means of red lead. The spindles should run easily without being loose, and should run at a dead level. All bearings should be guarded from dust as much as possible, and efficient means secured for their lubrication. Where the bearings are large and the pressure on them considerable, sulphur, black lead, or plumbago, reduced to a fine powder, and mixed with oil or tallow, retains the lubricating qualities of the unguent, and reduces the friction considerably. Soapstone is also highly spoken of as a lubricant for high-speeded spindles when reduced to a fine powder, and all gritty particles removed, and the powder mixed with unguents.

"Footstep" bearings, or those on which the lower ends of a vertical spindle rests, should have both lateral and vertical adjustments, and a recess for oil having direct communication with the bearing surface should be formed in the pedestal in which the bearing is fitted. Should a bearing "seize," pour cold water on it till thoroughly cool. If conical bearings are used care must be taken that the spindles are allowed no end play.

With machines having a reciprocating motion, such as saw frames, steam mortising machines, etc., it is of the utmost importance that firm and substantial foundations are provided, or, owing to the excess of vibration, the quality of the work turned out will be damaged. With machines working on the rotary principle, little difficulty is experienced, as most of the vibration is absorbed by the framing, assuming it to be well proportioned and the working parts truly balanced and fitted. To reduce the depth and lessen the cost of foundations, saw or swing frames should be connected to the crank shaft by two rods, one on either side of the frame. The reciprocating parts should be counter-balanced, and the crank shaft arranged as near the base of the machine as possible. The vibration is also considerably lessened by the introduction of a sheet of lead or a thin piece of hard wood between the base of the machine and crank shaft plunger blocks and the masonry.—Carpenter and Builder.

PATENT HORIZONTAL SAWING MACHINE.

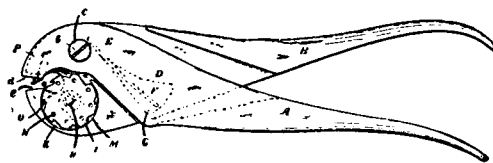
WE give herewith a rough sketch, taken from a model, and a few particulars concerning a Patent Horizontal Sawing Machine of English manufacture. The objects the inventors have in view are the reduction of space required for the machine, and a higher speed than can at present be attained by the ordinary horizontal.



PATENT HORIZONTAL SAWING MACHINE.

They state that the crank, being vertical, requires no balancing, and therefore vibration is reduced to a minimum. The slide of the machine is on an improved principle, the frame for carrying the saws being driven by a bell crank working vertically between the standards and the slide. The crank shaft is driven from a counter-shaft, which is fixed to the machine. The same shaft works the feed, and thus makes the machine self-contained. The pulley on the crank shaft has an extra long boss, which works in a pedestal fixed to the top of the machine, the crank shaft sliding up and down a long fixed key in the pulley. The table is worked on the same principle as the ordinary horizontal—a variable feed, and has a quick forward and return motion. The slide is raised by power, and everything is brought within easy reach of the operator. The machine will take up no more room than the length of the slide.

NEW CANADIAN PATENTS.

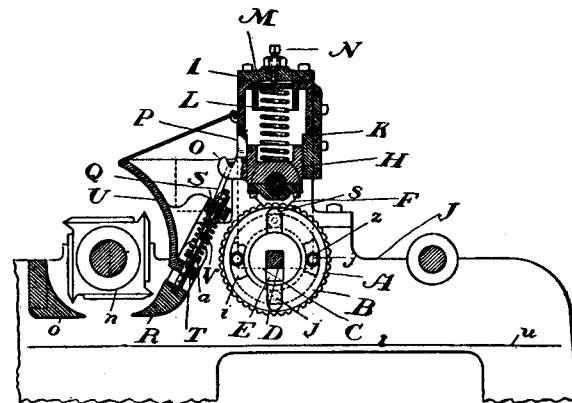


SAW SET.

Patentee: Mrs. Lydia Moyer, assignee of Samuel S^r Moyer and Alvin W. Moyer, all of Berlin, Ont., 13th May, 1895; 6 years.

Claim.—1st. A saw set, comprised of levers A and B, lever B having a cavity D, with a spring F secured therein, a disc K with a series of holes L, niches M and

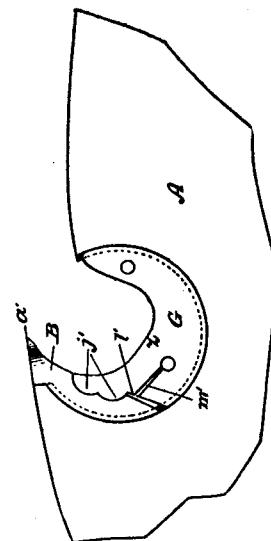
cavities O in niches, said disc secured to lever B by a thumb screw H, a steel pin P secured in jaw d of lever A, substantially and for the purpose set forth. 2nd. In combination with levers A and B, disc K, thumb nuts and spring F, substantially as described.



SECTIONAL FEED ROLLER AND PRESSURE BAR FOR PLANERS.

Patentee: MacGregor, Gourlay & Co., assignees of Thomas Cumming Robertson, and James McElroy, all of Galt, Ont., 21st, May, 1895; 6 years.

This is a patent in which there is a feed roller comprising a series of sections capable of rotating freely on sleeves carried by a fixed shaft and adapted to move vertically thereon; in combination with a pressure bar constructed in sections suitably supported and each connected with a corresponding section of the feed roller so as to move simultaneously therewith. In a feed roller is found the combination of the following elements: A series of feed roller section having grooves formed in each end thereof, a series of sleeves supporting said sections, a fixed shaft on which the said sleeves are vertically movable, a series of rings located between the sections of the rollers, a pair of studs connected to one side of the rings diametrically opposite to one another, a pair of studs connected to the opposite side of the rings at point intermediate of the other pair, the said studs entering the grooves in the ends of the adjoining feed roller sections and means for imparting motion to at least one section of the roller. In connection with the feed roller are also embodied other features that will give practical value to the invention. In a planer, a pressure bar comprising a series of shoes or independent sections sliding on lugs formed on a stationary bar in combination with adjustable springs suitably arranged to impart a downward pressure to the said shoes or sections, and spring pressure rollers suitably carried in vertically movable bearings and having hooks formed on the back of their bearings with which the said pivoted links engage, substantially as and for the purposes specified.



REMOVABLE SAW TEETH.

Patentee: Philias Bertrand, St. John, N. B., 20th May, 1895; 6 years.

Claim.—A removable saw tooth composed of two parts, namely, the bit or cutting part B, having formed in it the two circular recesses e', and point f' and the key part G, having the two circular projections j', holes h' and i' shoulder l', and slit m', all substantially as herein shown and described.