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Improved and Simplified Band Saw.

The endless or Band Saw has not heretofore received that degree of attention from our mechanics to which its merits entitle it. In England it is extensively used for wood work, and lately has been successfully employed on iron, especially for locomotive work. Visitors to the late fair of the American Institute must have observed the operation of the machine of which we give herewith illustrations, one being a perspective view of the machine complete, and the others of the saw guide.

With the exception of the table top, the machine is entirely of iron, the frame being strong while it is light. The standard, A, supports a frame, on which is an upright sliding block and arm sustaining a horizontal shaft running in boxes. On this shaft is hung the upper wheel, B, which by means of the screw and hand wheel, C, can be elevated or lowered as the length of the saw demands. The lower portion of the frame under the table supports the lower shaft and wheel, which is driven by the pulleys, D. The two wheels have a flange against which the back of the saw bears, and the faces of the wheels are covered with vulcanized rubber resting on a bedding of strong cloth. This gives sufficient adhesion to the saw to insure its action as a belt without slipping.

From the front of the upper frame depends a vertical bar, E, sliding in boxes, to which it may be secured, at any height required to accommodate the stuff to be sawed, by the thumb nuts, F. On the lower end of the bar is a guide, G, having four sides with recesses of varying depth to accommodate the various width of different saws. This guide is in two parts, held together by a screw bolt and graduated in the distance of their faces by means of the screw bolt and a four-pronged spring. The construction of the guide is better seen at H and I, the latter of which shows a section of the saw lying in one of the recesses. This guide can be turned quarter or half-way round to bring either of the different widths of recesses to engage with the saw.

The great advantage of the band saw over the reciprocating saw is, that there is no lost time in its operation, and no effort required to keep the work to the table, as the action of the saw tends to this result. Beside, there is no need of a pump or blower to clear away the saw dust, as it is carried continually downward. It was patented through the Scientific American Patent Agency, Aug. 28, 1866. Messrs. First & Prybil, the patentees and manufacturers, state that the saw travels at the rate of 4,000 feet per minute, and by actual experiment, will do four times the amount of work performed with an ordinary up and down saw. Its work is very smooth, requiring less after labor in finishing. Certainly it is a simple and economical machine, as is evident from its construction and operation. The manufacturers join the ends of the saw by silver solder, used in connection with a clamp made specially for the purpose, and the original temper of the plate is perfectly preserved.

All communications relative to the machine should be addressed to First & Prybil, 175 and 177 Hester street, corner Mott, New York city.

Plan for Converting Reciprocating into Rotary Motion.

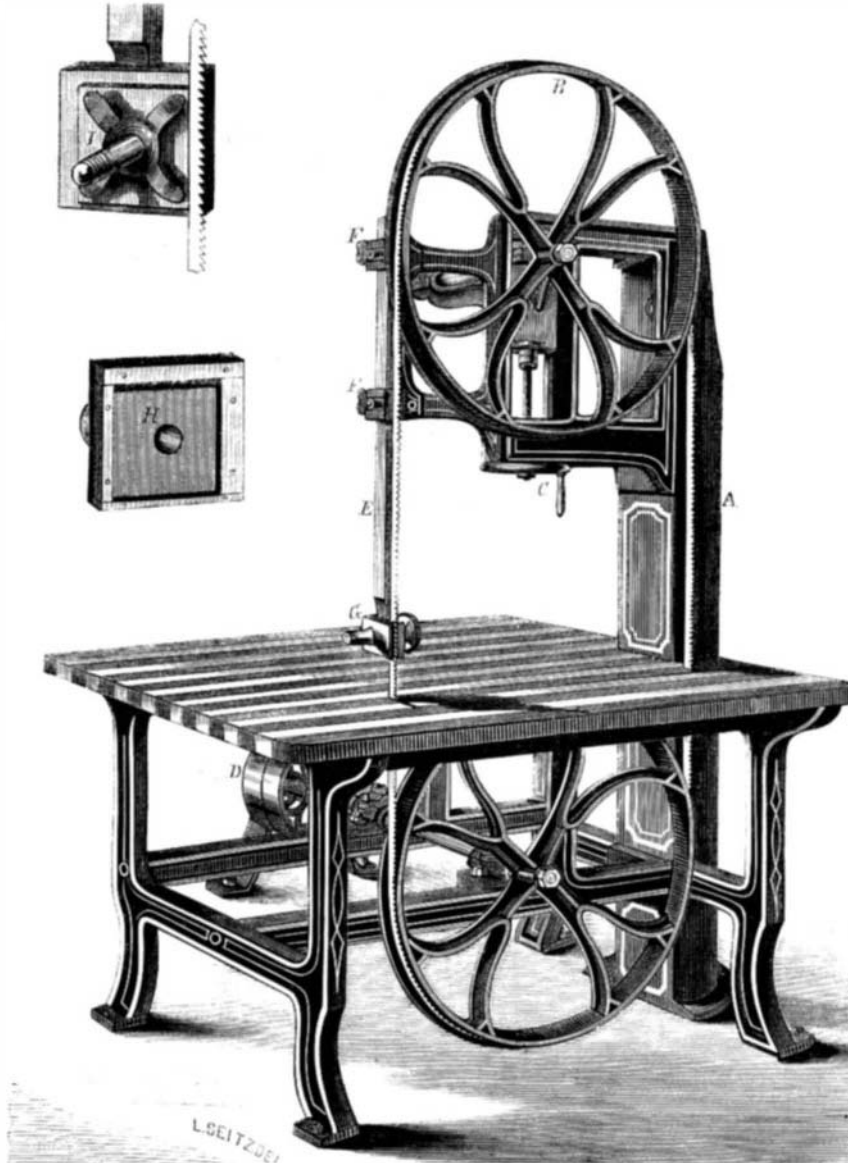
There have been quite a number of ingenious devices contrived to take the place of the crank, and avoid what are popularly supposed to be the defects in this method of converting motion. Whether this supposition is correct or not, it is probable that these attempts will be repeated indefinitely. That shown in the annexed engraving is one of the simplest, and the inventor says it has answered all his expectations. He has two engines of the same dimensions, taking steam from the same boiler, one, the ordinary crank engine, and the other running with the spiral cam, the latter giving by far the best results.

The engraving presents a top view of the engine, A being the cylinder, B the steam chest, C the crosshead, and D the spiral cam. From the lower surface of the crosshead project two pins, seen at E, which engage with the sides of the cam flanges and impart a rotary motion to the shaft on which the cam is mounted, and through the pulley, F, to machinery.

The model or pattern of the cam may be formed by turning a block of wood of the length of stroke required and of the same diameter. On both heads parallel lines are struck, and the ends of these lines connected by two other lines on the circumference, which, when the diameter of the block is, say, ten inches, will be ten inches apart and parallel to each other. Then with a pair of dividers, opened somewhat less than half

pin in the crosshead passes the extreme outer end of the cam, the inside pin, being at this moment the propelling power, does not pass the dead point until the outside pin has passed, when that becomes the propelling power until it reaches the opposite end of the cam."

Patented through the Scientific American Patent Agency March 26, 1867, by William H. Hurlbut, who may be addressed relative to the invention at Mirabile, Caldwell Co., Mo.



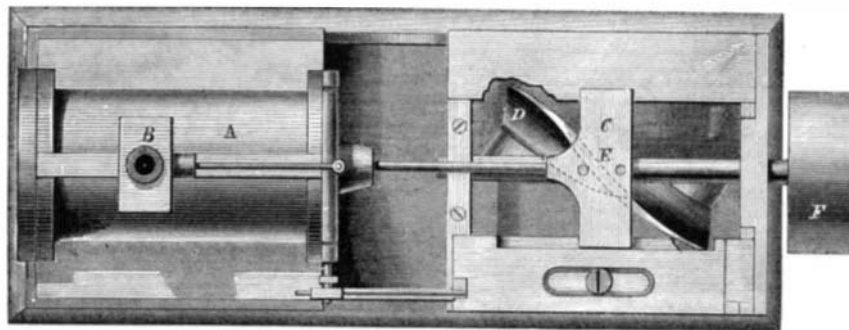
FIRST & PRYIBIL'S PATENT BAND SAW.

the diameter of the block, arcs are described from the opposite ends of the side lines. Then by opening the dividers to the full half diameter of the block and describing two other arcs, the thickness of the wings or flanges of the cam is determined. After repeating this operation on the opposite end of the block, the material is removed to the center of the block, leaving the parts between the arcs intact, and the cam is formed. The inventor says: "The flanged cam takes the

that torrents and freshets were much more injurious afterwards, and that the sea sand encroaches upon the arable fields as soon as the woods near the shore disappeared. Every one who has paid much attention to the subject knows that these changes take place, giving rise sometimes to remarkable phenomena. For instance, the long beach at Plymouth, when the Pilgrims landed there, was covered with trees, and an island of considerable extent outside of the beach was also wooded. Since the trees have been cut the sea has washed the island away so that it is covered by every tide, and the beach has become so narrow in some parts that the heavy seas break through it, and needs to be strongly protected by artificial means. As the security of the harbor of Plymouth depends upon this beach, the folly of cutting down the trees is now manifest.

The effect of the laws against cutting, and in favor of planting trees, in France, has been such, that of late years, instead of a steady decrease in the extent of woodland in the Empire, there has been a constant gain. In 1860 the wooded surface of France was 8,783,343 hectares, or less than 22,500,000 acres, the whole number of acres of land in France being at least 125,000,000. In 1865 the number of hectares in wood had increased to over 9,000,000, or nearly a million acres more than fifteen years. In a few of the other European countries preservation of wood has been undertaken, but nowhere with so much success as in France. Until within a few years, since coal has commanded a high price, the natural increase of wood in Massachusetts has kept pace with the amount cut off in each year.

But there is reason to believe that for the last year or two it has not been so, and in this part of the State especially,



HURLBUT'S SPIRAL CAM ENGINE.

place of the crank, and it has the great advantage that the power is applied always at the same distance from the center of the shaft, and under the most favorable circumstances, so that no dead center exists and a continuous revolving motion will be imparted to the shaft without requiring a fly wheel. It can be applied in all cases where a reciprocating rectilinear motion is to be converted into a rotary motion, and is used with great success on reaping machines in place of the crank. The cam is so constructed at its ends that when the outside