A. G. DEHLIN.

SHINGLE MACHINE SPUR ROLL RATCHET.

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1,428,362. Patented Sept. 5, 1922.

Fig. 1.

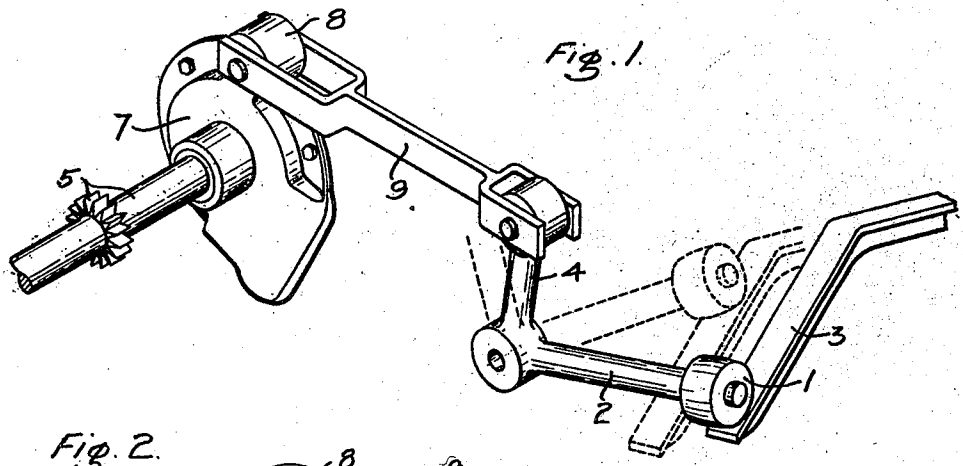

Fig. 2.

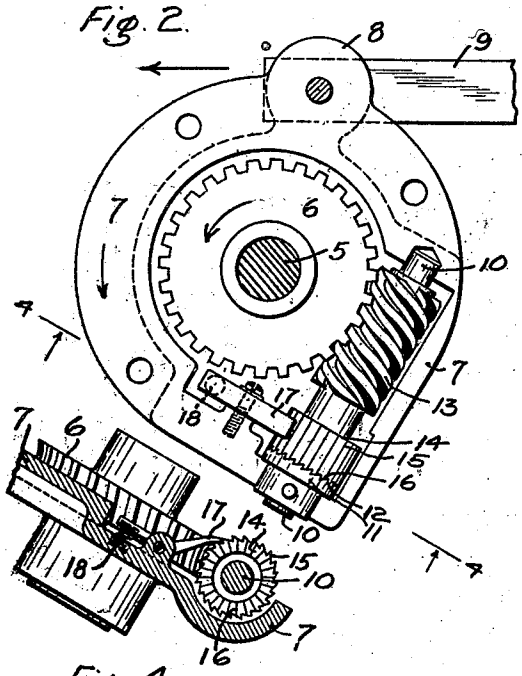

Fig. 4.

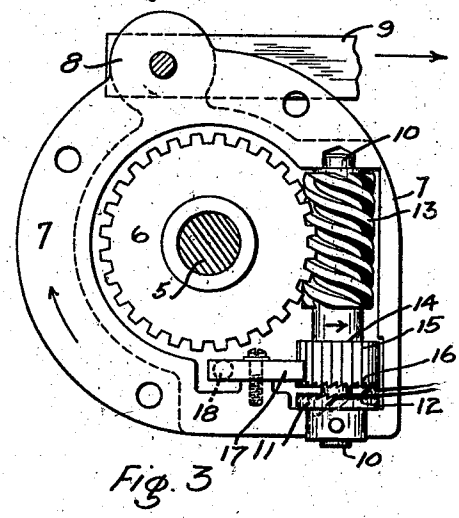

Fig. 3.

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SHINGLE MACHINE SPUR ROLL RATCHET.

Application filed April 8, 1922. Serial No. 550,754.

To all whom it may concern:

Be it known that I, AUGUST G. DEHLIN, a citizen of the United States, and a resident of Olympia, in the county of Thurston, State of Washington, have invented certain new and useful Improvements in Shingle Machine Spur Roll Ratchets, of which the following is a specification.

This invention relates to the mechanism by which the block, from which shingles are being cut, is automatically fed forward after each shingle has been cut therefrom in order to bring the block in line with the saw so that another shingle will be cut therefrom. The invention relates to that part of said mechanism wherein a reciprocating or oscillatory movement is transformed into an intermittent forward motion.

The objects of my invention are to provide a ratchet which will be simple and rugged in construction; which will be positive in action; which will have substantially no backlash; which will be very sensitive to a small movement; and whereby the desired thickness of the shingle may be accurately obtained.

I attain these and other objects by the devices, mechanisms, and arrangements illustrated in the accompanying drawings, in which—

Fig. 1 is a perspective view of my improved ratchet mounted in a spur roll feed mechanism;

Fig. 2 is a side elevation, with the cap removed, showing the ratchet in the feeding position;

Fig. 3 is a similar view showing the ratchet in released position; and

Fig. 4 is a section of my invention on the line 4—4 in Fig. 2.

Similar numerals of reference refer to similar parts throughout the several views.

In shingle machines the block of wood from which the shingles are being cut is firmly clamped between two spur rolls, one above and the other below the block, which are mounted on a reciprocating carriage. This carriage moves on tracks, by which it is guided, and draws the block past a circular saw, rotating in a vertical plane parallel to the motion of the carriage. The saw thus cuts a slice off the block, as the carriage advances, and then the carriage moves back a sufficient distance so that the block is entirely free from engagement with the saw. As the end of this returning stroke is approached the roller 1 (Fig. 1), on the end of the arm 2 of the bell-crank lever, engages an inclined plane 3 and rolls up it, thus turning the bell-crank lever on its pivot and moving the other arm 4 thereof. The plane 3 is itself automatically adjustable, by mechanism not shown, so that the amount of motion of the arm 4 is controlled, and this is usually so arranged that every alternate time that the roller 1 engages the plane 3 the said motion is very slight. When the carriage starts forward again the roller 1 passes down the plane 3 and the arm 4 is moved back into its original position. The result is therefore an oscillatory motion of the bell-crank lever. The ratchet is set to operate the spur roll when the roller 1 is passing up the inclined plane 3. As above stated, there are two spur rolls and each is operated by separate, though similar, mechanism and each plane is independently controlled. The planes are controlled in such a way that when the top spur roll feeds the upper end of the block a short distance the lower spur roll will feed the lower end a longer distance, and vice versa, thus tilting the block to make the saw cut a shingle of wedge-shaped section. It is evident that if the thin edge of the shingle is normally quite thin then a very small delay in action of its feed will result in its being too thin for practical use (while it would not make any substantial difference at the thick end of the shingle) and it is for this reason that the quick action and fine adjustment of the ratchet is important. In the drawings I have somewhat exaggerated the motion of the ratchet worm in order to make it clear but it is to be understood that actually it is only sufficient to enable the complementary teeth to clear each other.

The spur roll 5 of the drawings may be either the upper or the lower roll on the carriage. A worm wheel 6 is rigidly secured on the end of the roll 5. A casing 7, preferably split in two sections as shown, is loosely mounted on the end of the roll 5 and encloses the wheel 6 and the ratchet mechanism, to prevent dust from interfering with the free action of the ratchet. The casing 7 has a lug 8 extending therefrom. A link 9 connects the lug 8 with the above described arm 4 of the bell-crank lever. It will therefore be understood that the casing 7 has an

oscillatory motion corresponding with that of the said arm 4. A shaft or pin 10 is secured within the casing 7 and a disk 11 is also secured at one end thereof. The flat surface of the disk 11 is serrated by suitable sharp ratchet teeth 12. The pin 10 and disk 11 are fixed within the casing and move only therewith.

A worm 13 is loosely mounted on the pin 10 and engages the wheel 6. The worm 13 is free to rotate on the pin 10 and to slide therealong to a limited extent. An extension drum 14 of the worm 13 is provided with ratchet teeth 15 on its cylindrical surface and with ratchet teeth 16 on its flat end, said teeth 16 being complementary to the teeth 12 on the fixed disk 11. The worm slides on the pin a sufficient extent to bring said teeth 16 into or out of engagement with the teeth 12. A pawl 17 is pivoted to the casing 7 and is kept in contact with the drum 14 by means of the spring 18, of any desired form. I prefer to arrange the pawl so that it engages one of the teeth 15 when the worm has turned to such position that the teeth 16 do not immediately engage the teeth 12. The teeth 15 are broad enough to permit the drum to slide under the pawl without being disengaged therewith.

It is apparent then that if the link 9 is actuated so as to turn the casing 7 on the roll 5 in the direction shown in Fig. 3, the action of the worm wheel 6 will move the worm 13 on the pin 10 so as to disengage the teeth 16 from the teeth 12 and will simultaneously cause the worm to rotate on the pin in the direction of the arrow thereon, so that neither the pawl 17 nor the disk 11 interfere with its free rotation and therefore the roll 5 is not turned backward; but, the moment the direction of motion of the link 9 is changed to that shown in Fig. 2, the action of the wheel 6 on the worm 13 moves the worm on the pin 10 and simultaneously tries to turn the worm on the pin in a direction opposite to that shown in Fig. 3. The result is that either the pawl 17 engages one of the teeth 15, or the teeth 16 mesh with the teeth 12 of the fixed disk, and therefore the said worm is prevented from further turning on the pin, and the wormwheel 6 is locked to the casing 7. Hence when the link 9 moves as in Fig. 2, the roll 5 turns forward with it substantially without backlash or delay. The sensitiveness of this ratchet is attained by the fact that the worm 13 turns on the pin 10 at a much higher rate than the casing turns on the roll 5 and, in fact, this sensitiveness is such that less than one-hundredth of an inch of feed is lost between the engagement of the pawl or of the teeth 16 and 12.

Having described my invention what I claim is:—

1. In apparatus of the class described, a spur roll; an actuated casing loosely mounted on said spur roll; a worm wheel fixed to said spur roll and within said casing; a worm mounted in said casing and in constant engagement with said worm wheel; and means permitting said worm to freely turn in the casing in one direction but preventing it from turning in the opposite direction, whereby the worm wheel is locked in the casing and the spur roll is turned by the casing.

2. In apparatus as set forth in claim 1; wherein the worm is permitted axial movement; and a fixed means to prevent said worm from turning in the casing when the worm has been moved into contact therewith.

3. In apparatus as set forth in claim 2; said fixed means comprising a flat toothed surface; and said worm having a complementary flat toothed surface on its end, said axial movement of the worm being sufficient to bring said toothed surfaces into or out of engagement.

4. In apparatus as set forth in claim 3; ratchet teeth formed on an extension of the worm; a spring actuated pawl mounted in the casing and engaging said toothed extension in all axial positions of the worm.

5. In apparatus as set forth in claim 4; said pawl engaging a ratchet tooth at points of revolution midway between points at which the flat toothed surfaces engage, whereby the ratchet action is doubled in sensitiveness.

Signed at Tacoma, in the county of Pierce, State of Washington, this 3rd day of April, 1922.

AUGUST G. DEHLIN.