Aug. 6, 1935. F. H. SCHOFIELD ET AL 2,010,528

RATCHET DEVICE

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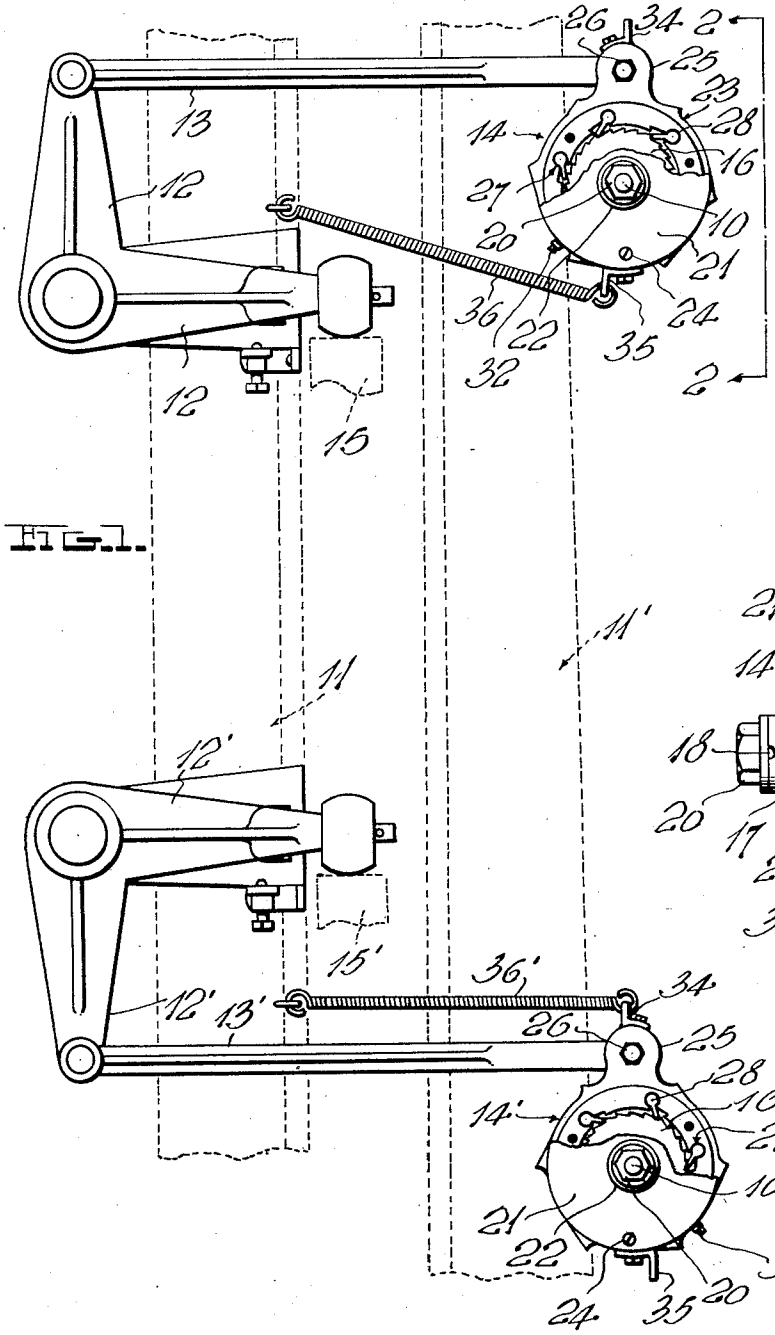


FIG. 1.

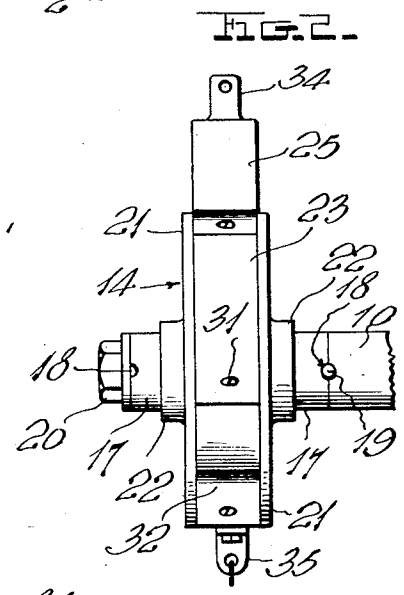


FIG. 2.

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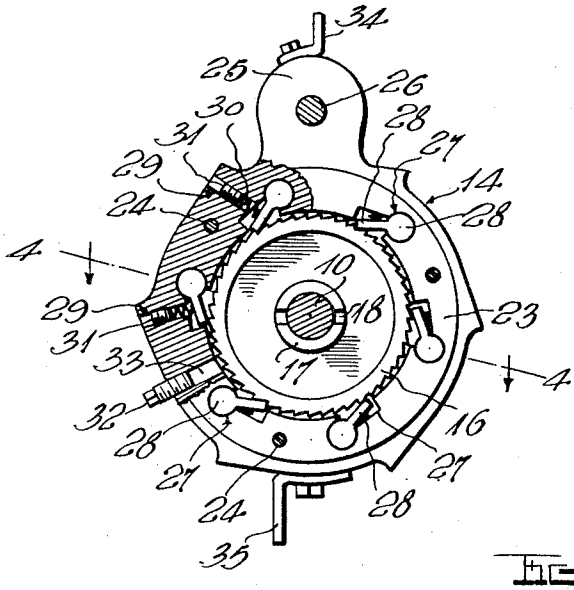
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Fig. 3.



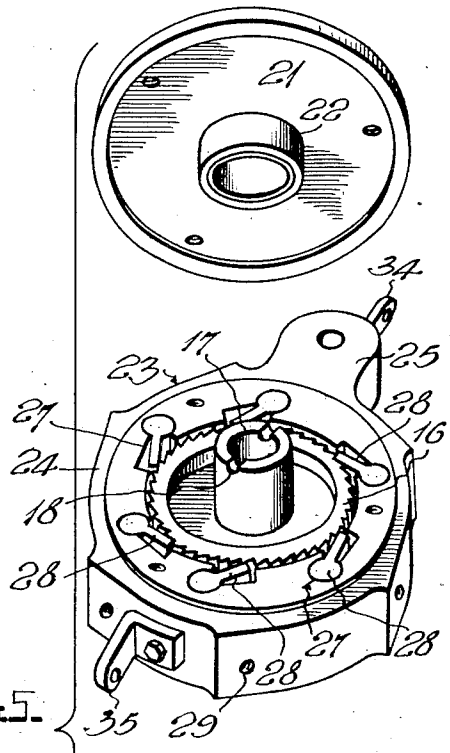
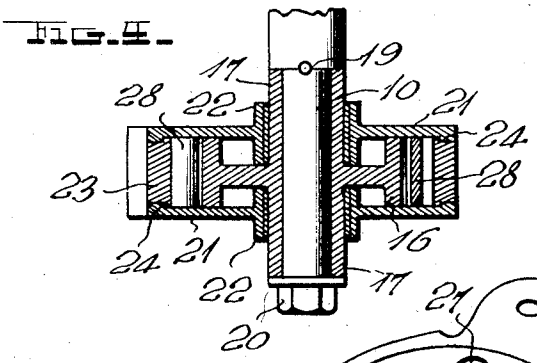


Fig. 5.

Fig. 4.



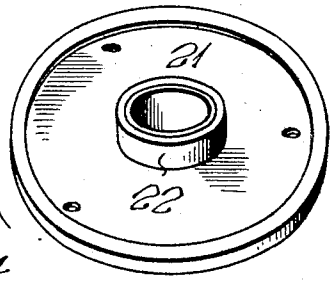


Fig. 6.

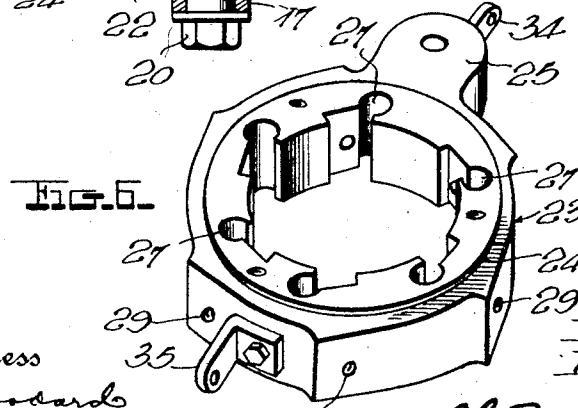


Fig. 7.



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Patented Aug. 6, 1935 2,010,528

UNITED STATES PATENT OFFICE

2,010,528

RATCHET DEVICE

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Application December 2, 1933, Serial No. 700,754

1 Claim. (Cl. 74—156)

The invention relates to shingle machines of the general type shown in U. S. Patents 885,327 of April 21, 1908 and 1,149,058 of August 3, 1915. In machines of this general character, a carriage provided with upper and lower feed rolls for the shingle blocks is reciprocable along tracks carried by a main frame, ratchet mechanisms are provided for turning the feed rolls, links or "feed roll arms" are employed for actuating the ratchet mechanisms, and bell cranks are connected with said links or feed roll arms for operating them, said bell cranks being actuated by cams mounted upon the main frame of the machine.

The ratchet mechanisms for machines of the general type above described, are not sufficiently sensitive to always advance the shingle block to the proper extent for insuring shingles of uniform thickness, and it is the principal object of our invention to provide a new and improved mechanism which will overcome this difficulty.

Another object is to provide a ratchet mechanism which may be applied without change in structure to either the upper or the lower feed roll.

All movable parts of the improved ratchet mechanism are encased in a grease containing casing to insure proper operation and long life, this casing for the upper ratchet mechanism is moved in one direction by the associated bell crank and link, and said casing for the bottom roll, is moved in the opposite direction by the bell crank and link associated therewith, and a further object is to provide the casing with novel projecting lugs to which coiled return springs may be connected for returning the casings, the pawls therein, the links and the bell cranks after each operation thereof, the spring for the upper casing being connected to one of said lugs and the spring for the lower casing connected with the other of said lugs.

Yet another object is to provide a ratchet mechanism which may be rather easily and inexpensively manufactured and marketed, may be quickly and easily applied to either the upper or lower feed roll shaft of the shingle machine, will smoothly and sensitively operate, and will be long-lived.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is an elevation partly broken away looking toward the ends of the feed roll shafts and showing the ratchet mechanisms and associated parts for turning said shafts step-by-step.

Fig. 2 is a fragmentary side elevation as indicated by line 2—2 of Fig. 1.

Fig. 3 is an enlarged side elevation of one of the ratchet mechanisms, parts being removed and other parts being shown in vertical section.

Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 3.

Fig. 5 is a disassembled perspective view.

Fig. 6 is a perspective view of the central ring of the ratchet mechanism with its driving and spring-attaching lugs.

Fig. 7 is a perspective view of one of the pawls.

In the drawings above briefly described, 10 and 10' denote the upper and lower feed roll shafts, and 11 and 11' refer to portions of the reciprocable carriage upon which said feed rolls and parts of their operating mechanisms are mounted. Included in these operating mechanisms, are upper and lower bell cranks 12 and 12', upper and lower links or "feed roll arms" 13 and 13' pivoted to said bell cranks respectively, and upper and lower ratchet mechanisms 14 and 14' connected with said links or feed roll arms and mounted upon the feed roll shafts 10 and 10' respectively. The bell cranks 12 and 12' are operated at the proper time by cams 15 and 15' on the main frame of the machine. When so operated, the upper bell crank 12 pulls upon the upper link or the like 13 and this pull is transmitted by the upper ratchet mechanism 14 to turn the upper feed roll shaft 10 in one direction. The movement of the lower bell crank 12', effected by the cam 15' however, exerts a push on the lower link or the like 13', and the lower ratchet mechanism 14' transmits this push to the lower feed roll shaft 10' to turn this shaft oppositely from the shaft 10. The result is that the lower peripheral portion of the upper feed roll and the upper peripheral portion of the lower feed roll, both move in the same linear direction to advance the shingle block. In order to obtain the necessary directional rotations of the upper and lower feed rolls, it is necessary that the lower ratchet mechanism 14' be the reverse of the upper ratchet mechanism 14, but the present invention is such that the same structure will suffice for both of these mechanisms, it being simply necessary to apply them so that one side of the upper ratchet casing is toward the feed roll and the same side of the lower ratchet casing is presented away from the feed roll. In other words, the lower ratchet mechanism is turned 180° about a vertical axis, from the position occupied by the upper ratchet mecha-

nism. Both of these mechanisms are of identical construction and hence a description of one will suffice, the upper mechanism 14 being selected for this description.

The numeral 16 denotes a ratchet wheel having a hub 17 projecting uniformly beyond the opposite sides of the wheel, said hub being adapted for mounting upon the feed roll shaft and having notches 18 in its ends to engage the usual pin 19 carried by the shaft, the hub being held against the pin by the customary nut 20. While this detailed construction is preferably followed, other provisions could of course be made for holding the hub upon the shaft.

Two circular side plates 21 are provided at opposite sides of the ratchet wheel 16, the centers of said side plates being provided with appropriate bearings 22 mounted snugly yet rotatably upon the end portions of the hub 17. A peripheral ring 23 is secured between the side plates 21 by screws or the like 24 in a fluid-tight manner, said ring having an upwardly projecting driving lug 25 to which the link or the like 13 is pivoted by a bolt 26. Internally, the ring 23 is provided with pawl recesses 27 spaced apart circumferentially of said ring, and a plurality of pawls 28 are pivotally mounted in these recesses for engagement with the teeth of the ratchet wheel 16. The ring 23 is also formed with radial openings 29 leading from the pawl recesses 27 to the exterior of the ring, said openings containing coiled springs 30 for pressing the pawls against the ratchet wheel. The outer ends of the openings 29 are closed by appropriate screw plugs 31 and another plug 32 may be provided for a grease introduction opening 33.

The casing formed by the side plates 21 and ring 23 is provided with an upwardly projecting lug 34, preferably carried by the driving lug 25, and with a downwardly projecting lug 35. A coiled tension spring 36 is connected at one end with the lug 35 and at its other end is suitably anchored upon the frame or carriage portion 11. Each time the bell crank 12 pulls upon the link or the like 13 and swings the casing in one direction to cause the pawls 28 to turn the ratchet wheel 16, the spring 36 is stretched, and when the aforesaid bell crank 12 recedes from its cooperating cam 15, said spring 36 returns the casing, the link 13, the bell crank and the pawls 28, in readiness for the next actuation thereof.

A return spring 36' is provided for the casing and pawls of the lower ratchet mechanism, and for the link 13' and bell crank 12', but this spring is connected at one end with the lug 34 and is anchored at its other end to the part 11 of the machine. After each operation of bell crank 12', link 13' and the lower ratchet mechanism, by means of the cam 15', spring 36' returns said parts to normal.

The pawls 28 are preferably so spaced that they do not all engage the ratchet teeth at any one time. This is done to make the ratchet mechanism much more sensitive, for regardless of the particular extent to which the casing be turned by the return spring, after operation of the ratchet mechanism, it is insured that one pawl or another will then engage the ratchet so that just as soon as the aforesaid casing is turned in the other direction under the influence of the cam 15 and 15', the feed roll will start to turn.

It will be seen from the above that novel and advantageous improvements have been made and that the improved ratchet mechanism may be applied with equal ease to the upper or to the lower feed roll so that two specially constructed mechanisms are not required. On the upper ratchet mechanism, the grooves 18 in one end of the hub 17 of course engage the pin 19, while for the lower mechanism, the grooves in the opposite end of said hub engage said pin, the hub, ratchet wheel, pawls and casing being bodily turned 180° about a vertical axis from their positions on the upper feed roll to adapt them for application to the lower roll.

While the details disclosed may be considered as preferred, variations may of course be made within the scope of the invention as claimed.

We claim:

A driving ratchet for a shingle machine feed roll comprising a fine-tooth ratchet wheel having a hub which projects in opposite directions from the wheel body, the ends of said hub each having a pin-receiving groove, a flat-sided ring surrounding said ratchet wheel and having internal pawl recesses which open through both flat sides of the ring, said ring also having spring-receiving openings from said pawl recesses to the periphery of the ring, said ring periphery being provided with an integral radially projecting driving lug which is in turn provided with a return spring lug, pawls mounted in the aforesaid recesses for engagement with the fine teeth of said ratchet wheel, said pawls being so spaced that they do not all engage the ratchet teeth at once, springs in said spring-receiving openings engaging said pawls, screw plugs in the outer ends of said spring-receiving openings and abutting said springs, two flat side plates having central bearings mounted on said wheel hub, said side plates lying against said flat sides of said ring and abutting said pawls to hold the latter in said recesses, interlocking means on said side plates and said ring to prevent the thrust of said pawls from expanding said ring, fasteners securing said side plates to said ring, and a second return spring lug secured to said ring at a point diametrically opposite the aforesaid lugs.

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