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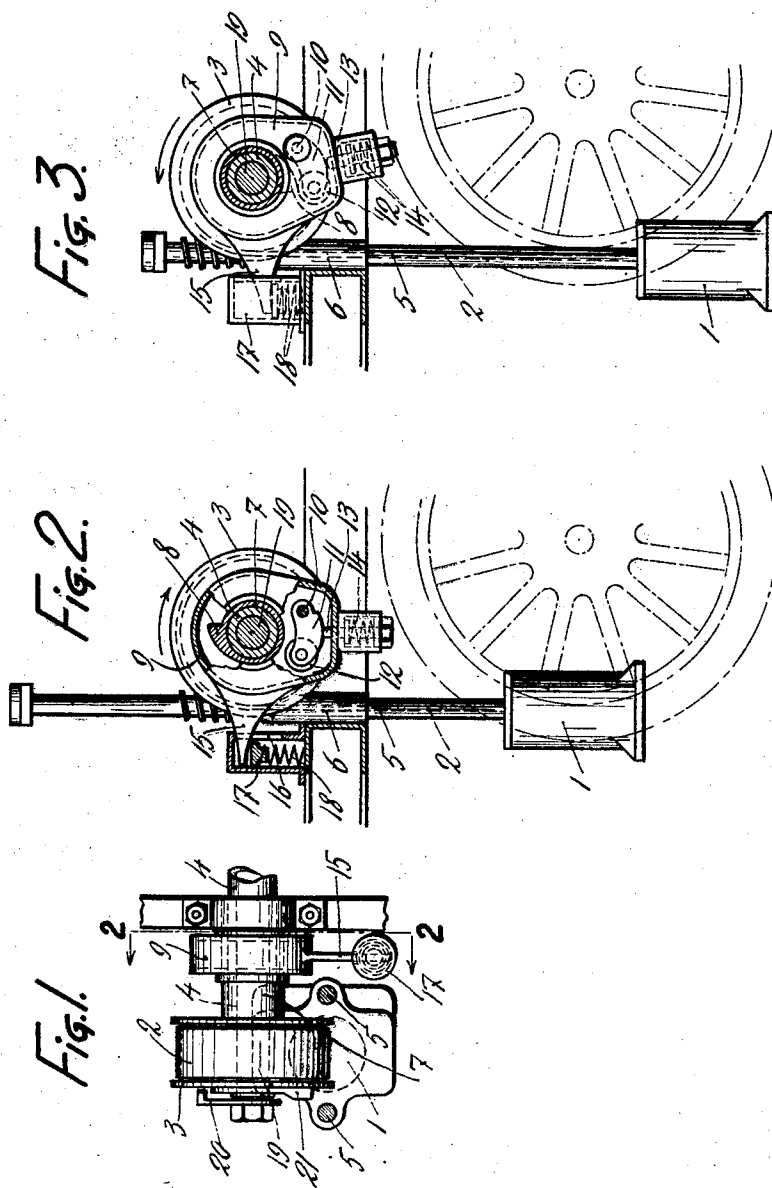
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PAVING RAMMER

Filed Sept. 22, 1926

2 Sheets-Sheet 1



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Fig. 5.

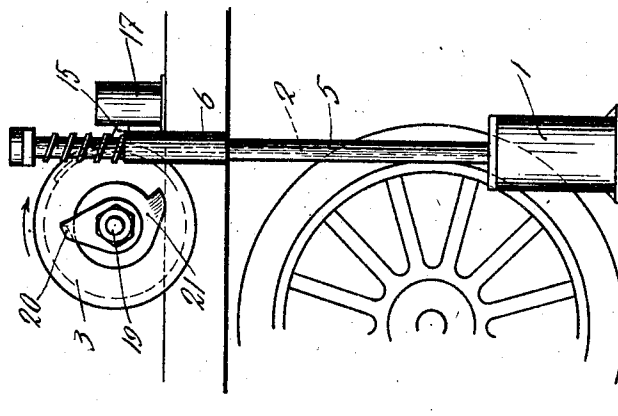
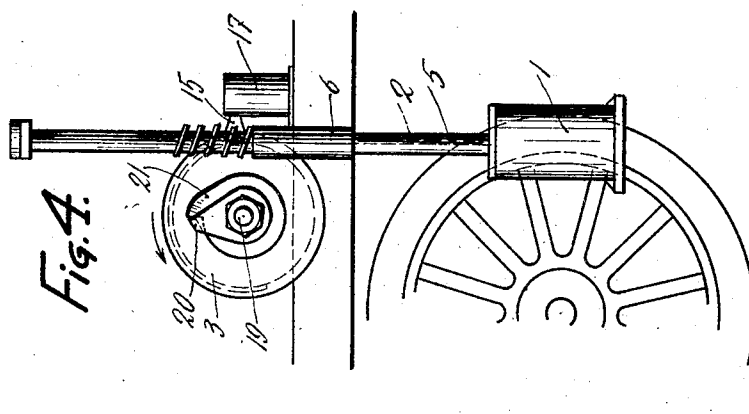


Fig. 4.



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PAVING RAMMER.

Application filed September 22, 1926, Serial No. 137,023, and in Sweden August 28, 1926.

The present invention refers to apparatus for ramming paving stones or the like and working with a rammer moving up and down and which by means of a lifting member (usually in the shape of a belt or the like) is connected to an oscillating member adapted to be connected to and disconnected from a rotatable driving member in such a manner as to allow the said oscillating member, when being connected, to partake in the motion of the driving member for a suitable distance in order to raise the rammer, but then to be disconnected from the driving member so as to be returned by the action of the rammer falling freely downwards. The said returning of the oscillating member is effected with very great speed on account of the considerable weight of the rammer and the comparatively great height of fall. As soon as the rammer has fallen down the oscillating motion of the said member must be stopped as very great strains should else occur in the lifting member where the rammer is suspended, the said strains causing the lifting member to burst sooner or later. This invention has for its object a yielding brake acting successively for stopping the oscillating member, immediately after the rammer has fallen down.

A suitable form of the invention is shown in the annexed drawings where

Figure 1 is a plan view of the apparatus. Figure 2 is a vertical section on the line 2—2 of Figure 1, showing the rammer in raised position. Figure 3 is a similar vertical section showing the rammer in lowered position. Figures 4 and 5 are end views of the apparatus corresponding to Figures 2 and 3.

The rammer 1 is connected by a belt 2 or another flexible lifting member to an oscillating member in the shape of a drum 3 being in known manner automatically connected to and disconnected from a rotating driving member in the shape of a sleeve 4 communicating with a motor (not shown in the drawing). When the drum 3 is being connected to the sleeve 4 rotating in the direction of the arrow, Figure 2, the drum accompanies the rotating member for a distance, the rammer 1 being thereby raised from the

ground. When the drum 3 is then disconnected from the said sleeve it is immediately returned with great speed by the falling rammer, the drum being then again connected to the sleeve and so on. In order that the rammer may be guided during its movements vertical rods 5 are provided which are movable in guidings 6 on the frame of the machine, the lower ends of the said rods being fixed to the rammer.

The drum 3 is firmly connected to a hub 7, Figures 1 to 3, mounted loosely on the sleeve 4. On the said hub there is a projecting cam 8, Figures 2 and 3. On the hub 7 a cap 9 is loosely mounted, a pin 10 being located in the interior of the said cap, one end of an arm 11 being pivotal on the said pin and its other end being provided with a roller 12 located in the same vertical plane as the cam 8. A slidable pin 13 or the like rests against the arm 11 and is acted upon by a comparatively strong spring 14 tending to keep the said pin pressed against the arm 11. The cap 9 has a projection 15, the free end of which by a groove 16, Figure 2, enters into a sleeve 17 fixed to the frame of the machine and enclosing a comparatively weak spring 18 which tends to maintain the projection 15 pressed upwards.

When the rammer falls the drum 3 is rotated in the direction indicated by the arrow in Figure 3, while the cap 9 loosely mounted on the hub 7 of the drum is maintained in the position shown in Figure 2 by means of the spring 18. As soon as the rammer falls down the cam 8 on the hub 7 touches the roller 12 whereby the arm 11 is swung downwardly against the action of the spring 14. When the cam 8 touches the said roller so strong friction is effected between the cam and the roller, on account of the action of the spring 14, as to bring the cap where the arm 11 is located to rotate in the same direction as the hub 7, thus in the direction of the arrow in Figure 3, against the action of the spring 18. The drum 3 to which a very great speed is imparted by the heavy rammer falling down is thereby braked softly and successively first by the spring-actuated roller 12 and then also by the spring 18.

When the members have nearly reached the position shown in Figure 3 the movement of the hub 7 and the drum 3 has ceased.

When the drum 3 is again connected to the motor-driven sleeve 4 for raising the rammer the drum and the hub will be rotated anew in the direction indicated by the arrow in Figure 2 so that the cam is brought out of contact with the roller, and the spring 18 acting upon the projection returns the cap 9 into the initial position shown in Figure 2. When the rammer has reached its raised position the members again occupy the position shown in Figure 2, and they are now ready to act at the next stroke of the rammer.

The brake device described above has been completed by a safety-device getting into function in case the belt or the flexible member where the rammer is suspended should burst. If the belt bursts when the rammer is being raised, the drum 3 when being disconnected from the sleeve 4 cannot be returned in the direction of the arrow, Figure 3, by the falling rammer, as is normally the case, but the drum continues its movement in the direction of the arrow, Figure 2, on account of the inertia, whereby the cam 8 touches the arm 11, thus preventing the drum from continuing its movement. But as the drum 3 is then as usual connected to the motor-driven sleeve 4 rotating in the direction of the arrow, Figure 2, one of the members must of course burst. In order to prevent this the following measures have been taken.

At the end of a stoppable shaft 19 on which the motor-driven sleeve 4 is rotating an arm 20 is jammed, Figures 1, 4 and 5, and on the adjacent wall of the drum 3 there is a projection 21 located in the same vertical plane as the arm 20. When the rammer is in its raised position, Figures 2 and 4, the projection 21 rests against the arm 20 or is in the immediate vicinity of same, Figure 4, and when the rammer is in its lowermost position, Figures 3 and 5, the projection 21 occupies the position shown in Figure 5. As soon as the drum 3 has been disconnected from the sleeve 4 the projection 21 hits the arm 20, so that the drum, in case the belt 2 should burst, cannot continue its rotation in the direction of the arrow, Figures 2 and 4. Usually, there is no risk of the drum continuing its rotation in the direction of the arrow, Figures 2 and 4, when being disconnected, as it is at once rotated in the opposite direction by the falling rammer. The drum 3 being stopped by the arm 20 and the projection 21 just in the position occupied when being disconnected the drum cannot be connected again to the motor-driven sleeve 4, as the connecting means of the sleeve when the drum occupies the said position cannot get into connecting engagement with the drum. Consequently, the sleeve 4 is rotating freely, and no damage may be inflicted on the mem-

bers of the machine, if the belt should burst.

Several modifications of the shown and described means may be made without the idea underlying the present invention being given up.

Having now particularly described and ascertained the nature of my invention, I declare that what I claim is:

1. In a ramming machine of the character described, the combination of an upright reciprocating ram, and lifting means for the ram comprising a rotary driving member, an oscillating element associated with said driving member, means to connect and disconnect the oscillating element from the driving member whereby the oscillating element partakes of the movement of the driving member a predetermined distance and then disconnects from the member to permit the oscillating element to return to its initial position with fall of the ram, and a yieldable braking means operating on said oscillating element to hold the latter stationary subsequent to the fall of the ram.

2. A ramming device, as claimed in claim 1, in which the braking means consists of a plurality of braking members operating successively one after another.

3. In a ramming machine of the character described, the combination of an upright reciprocating ram, and lifting means therefor, comprising a rotary driving member, an oscillating element associated with said driving member, means to connect and disconnect the oscillating element from the driving member whereby the oscillating element partakes of the movement of the driving member a predetermined distance and then disconnects from the member to permit the oscillating element to return to its initial position with the fall of the ram, and a yieldable braking means operating on said oscillating element to hold the latter stationary subsequent to the fall of the ram, said braking means comprising a cam mounted to turn with said oscillating member, a spring actuated roller operating on the cam to brake further movement of the oscillating member past a certain degree of movement thereof, and an auxiliary brake actuating member carried by the roller brake and effective subsequently to the first braking action of the roller.

4. A ramming device as claimed in claim 3, in which the cam of the braking means is mounted on a hub forming an integral part of the oscillating member, a housing enclosing the cam and having a radially projecting portion, said housing being loosely mounted on said hub, a spring supported arm pivoted on the housing and carrying at its free end the said braking roller disposed in the path of the cam, the auxiliary braking member being formed by the radial projection of the housing and a spring, whereby the

cam having depressed the roller and utilized the full braking capacity of the brake thereafter rotates the housing and the projection engaging the spring to impart a further braking action to the movement of the oscillating member when the ram has reached its lowermost position.

1, including a stop to be engaged by the oscillating element at a point corresponding to its position at the time the said element is disconnected from the driving member. 10

In witness whereof, I have hereunto signed my name.

ERNST HJALMAR CARLSSON.

5. A ramming machine as claimed in claim