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CARRIAGE FOR CUTTING OR SAWING MACHINES

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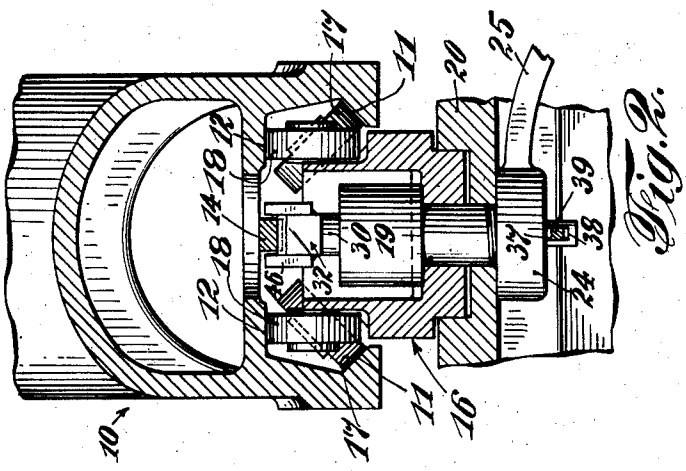


Fig. 2.

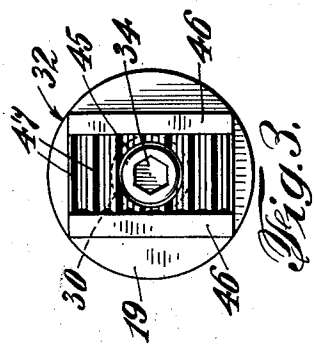


Fig. 3.

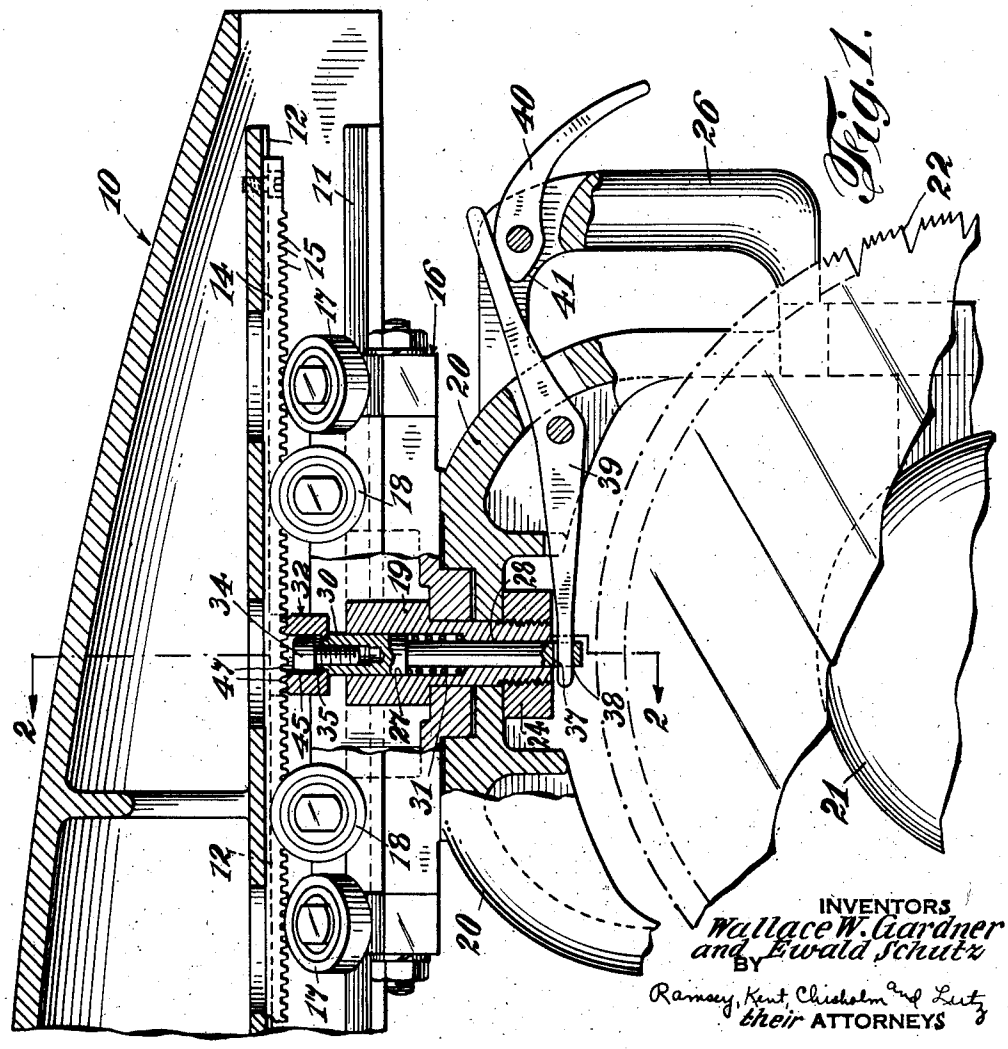


Fig. 1.

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CARRIAGE FOR CUTTING OR SAWING MACHINES

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4 Claims. (Cl. 143—47)

This invention relates to improvements in carriage construction for cutting or sawing machines and more particularly to improvements in safety devices associated with such carriages.

In the operation and use of sawing and cutting machines having cutting elements rotating at high speed and being movable relative to a supporting member, some danger is experienced in that the cutting element may be moved adventitiously to the peril of an operator.

An object of the present invention is to provide safety mechanisms in conjunction with a movable high speed cutting element, which safety mechanisms are automatically operable, when an operator releases the cutting element, to hold the same against movement relative to its support.

Another object of the invention is to provide a releasable locking device associated with a movable high speed cutting element, which locking device can be readily operated to permit movement of the cutting device at an operator's will.

A further object of the invention is to provide a trigger mechanism associated with the handle of a movable high speed cutting element, which trigger can be moved to release the cutting element for movement when the handle is gripped by an operator, and which trigger automatically moves to relock the cutting element against movement when the handle is released.

In carrying out the foregoing and other objects of the invention, use is made of a locking member associated with a carrier for a high speed cutting element. This carrier is preferably provided with a handle for manipulation by an operator and the carrier is mounted for movement relative to a suitable support. The carrier, in conventional fashion, may be mounted either in an arm extending from a support for movement relative to the arm or may be secured at the end of an arm, which arm is movable relative to the support.

The present invention provides means whereby movement of the cutter carrier relative to the support is prevented when an operator has released the handle. To this end the invention in its preferred form makes use of a rack member secured within an arm having tracks for the support of a carriage on rollers. The carriage itself is provided with a cooperating member having teeth to engage the teeth of the rack, such member being normally spring pressed into engagement with the rack to prevent movement of the carriage. The carriage is provided with a handle to which is secured a trigger member connected by suitable linkage to the cooperating member so that when the handle is gripped by an operator, the trigger serves to operate the linkage to disengage the locking member from the rack whereby the carriage can be moved relative to the arm. When the handle is released by an operator the spring means associated with the locking member restores such locking member to engagement with the rack so that accidental movement of the carriage relative to the arm is prevented.

Other features, objects and advantages of the invention will become apparent by reference to the following detailed description, wherein

Fig. 1 is a view partially in vertical section of such parts of a sawing or cutting mechanism as are necessary to illustrate the invention, such view showing the locking mechanism partially in section and partially in side elevation;

Fig. 2 is a section taken substantially on the line 2—2 of Fig. 1, and

Fig. 3 is an enlarged top view of the locking element associated with a rack secured in the arm.

Referring now to the drawing wherein parts of one conventional type of structure for the manipulation of a high speed cutter are illustrated, 10 represents generally a portion of a horizontally extending arm, which arm can be elevated and moved about a vertical axis in the usual fashion. This arm has as a part thereof two oppositely disposed tracks 11 extending in an angular direction, and two oppositely disposed tracks 12 aligned in a horizontal plane. Also secured within the arm and extending lengthwise thereof is a rack member 14 having a plurality of teeth 15 in the underside thereof.

Associated with the arm is a saw carriage indicated generally at 16 which carriage has two pairs of rollers 17 adapted to roll on the tracks 11 and two pairs of rollers 18 adapted to be forced against and roll on the upper tracks 12. The carriage itself may be of any desired shape permitting the mounting thereon of the respective pairs of rollers. Secured to the carriage by means of a king pin 19 is a yoke member 20 which serves as a hanger for an electric motor 21 having a cutting element 22 either directly secured to the motor shaft or geared thereto. As shown in Figs. 1 and 2, the king pin 19 has its upper portion of larger diameter than the lower portion which passes through an opening in the carriage 16 and also through an aligned opening in the yoke 20. The lower end of the king pin 19 is externally threaded for the reception of a nut 24 having a handle 25

extending therefrom which is used to fasten the yoke against rotation relative to the carriage. The yoke 20 is provided with a handle 26 which can be gripped by an operator to move the yoke and carriage as a unit relative to the arm 10.

The king pin 19 is provided with a bore 27 and with a counterbore 28. Extending through the king pin is a plunger member 30 having a part fitting within the bore 27 and a part fitting within counterbore 28. Also located in the bore 27 and surrounding plunger 30 is a coiled spring 31 which serves to force the plunger 30 upwardly.

Secured to the top of the plunger 30 is a locking element 32 which is fastened to the plunger by means of a hollow headed screw 34 passing through the bottom of a recess in the member 32 into a threaded aperture in the top of the plunger. A washer 35 surrounds the shank of the set screw 34 and permits this screw to be tightened sufficiently to lock the same in place while at the same time the member 32 has a portion seated on a step on the top of the plunger 30 so that the member 32 is free for rotation relative to the plunger. The lower end of the plunger 30 extends below the lower end of the king pin 19 and is provided with a through transverse slot 37, the floor of which is slightly rounded as shown at 38. A lever 39 is pivotally secured to the yoke 20 and has one end thereof extending through the slot 37. The other end of the lever 39 extends beyond the yoke to a point adjacent the top of the handle 26. A trigger member 40 is pivotally secured in a suitable slot in the handle and the trigger has one end part thereof cammed as at 41 to bear against the under surface of the outer end of lever 39.

The locking member 32 is of general rectangular shape and as before mentioned has a centrally disposed recess 45, the bottom of which is apertured for the passage of the shank of the screw 34; the head of such screw being seated in the recess 45. Member 32 has two upstanding walls 46 spaced apart sufficiently to permit them to engage the opposite side edges of the rack 14. The floor of the locking member between the side walls 46 is provided with a plurality of teeth 47 shaped and disposed to engage the teeth 15 of rack 14. The side walls 46 serve to prevent rotation of the locking member 32 relative to the rack 14 but at the same time do not interfere with rotation of the king pin and plunger 30 relative to the locking member. These side walls extend upwardly sufficiently to assure proper engagement of the locking member with the rack for the prevention of rotation of the locking member in even its most depressed position wherein the teeth of the cooperating parts are out of engagement.

The operation and use of this safety mechanism is substantially as follows. The normal positions of the various parts are shown in Fig. 1 wherein it will be seen that the locking member 32 is pressed upwardly by spring 31 to cause engagement of teeth 47 of this locking member with teeth 15 of the rack. In this position the carriage is effectively locked against movement along the tracks 11 and 12 of the arm 10. Likewise, as shown in Fig. 1, the trigger 40 extends outwardly relative to the vertical expanse of handle 26, also under the impetus of the spring 31. When an operator desires to move the carriage longitudinally of arm 10, gripping of handle 26 by the operator causes pivotal movement of trigger 40 which in turn rocks the lever 39 about its fulcrum, pulling the plunger 30 downwardly to thereby disengage teeth 47 from teeth 15. When such disengagement has been accomplished, the carriage and yoke with motor and saw attached can be moved as a unit with the pairs of rollers rolling on their respective tracks. When the operator releases the handle the spring 31 restores the parts to the Fig. 1 position locking the carriage against any longitudinal movement relative to the arm. The yoke may be in any angular position relative to the carriage without interfering with the operation of the safety mechanism, since the king pin and plunger can rotate relative to the locking member.

From the foregoing it will be seen that the present invention provides safety mechanism for preventing accidental movement of a saw or other cutter carrier relative to its support so that the chances of the cutter endangering an operator are materially lessened. This device is of particular importance in installations wherein the support for the carrier may be mounted on an unstable surface such as, for example, on board ship, in which instances the normal movement of a ship might cause movement of the carriage to the danger of an operator if such carriage were not locked against movement when not in actual use or under the direct control of the operator. It is to be understood that the illustrated embodiment shows merely one form of the invention and that any limitations imposed upon the same are to be only those set forth in the following claims.

What is claimed is:

1. In apparatus of the character described, a horizontally extending arm, a support, a carrier for a rotatable cutter, said carrier being secured to said support for movement longitudinally thereof, a motor yoke pivotally secured to said carrier, said yoke being provided with a handle for causing movement of the yoke and carrier as a unit, a rack secured to said arm, a rotatable plunger extending axially through said yoke and through said carrier, a toothed locking member on one end of said plunger, means for yieldingly forcing said toothed member into engagement with said rack to normally lock said carrier against movement relative to said support, and releasing means rotatable with said yoke, said releasing means being connected to said plunger and adapted to be actuated when said handle is gripped to release said toothed member from said rack whereby said carrier can be moved, said toothed member being held against rotation relative to said rack.

2. In apparatus of the character described, a horizontally extending arm, a carrier secured to said arm for movement longitudinally thereof, a yoke secured to said carrier for rotation relative thereto about a vertical axis, a motor driven rotatable cutting element mounted in said yoke, cooperating members carried by said arm and said carrier for normally locking said carrier against longitudinal movement relative to the arm, and releasing means carried by said yoke and connected to one of the cooperating members, said releasing means being rotatable along with said yoke while said cooperating member to which the releasing means is connected is held against rotation.

3. In apparatus of the character described, a horizontally extending arm, a carrier secured to said arm for movement longitudinally thereof, a yoke secured to said carrier for rotation relative thereto about a vertical axis, a motor driven rotatable cutting element mounted in said yoke, co-

operating members carried by said arm and said carrier for normally locking said carrier against longitudinal movement relative to the arm, means for holding said cooperating members against relative rotation, and releasing means carried by said yoke and connected to one of said cooperating means, said releasing means being rotatable along with said yoke while said cooperating members are held against rotation.

4. In apparatus of the character described, a horizontally extending arm, a rack secured to said arm, a carrier secured to said arm for movement longitudinally thereof, a yoke secured to said carrier for rotation relative thereto about a vertical axis, a motor driven rotatable cutting element mounted in said yoke, a toothed member normally biased to engage said rack and held against rotation relative to the rack, a plunger for moving said toothed member, and releasing means carried by said yoke and connected to said plunger, said releasing means and said plunger being rotatable along with said yoke while said toothed member is held against rotation.

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