Oct. 28, 1952 P. PÉGARD 2,615,373

SAFETY STOPPING DEVICE FOR MOVABLE MACHINE-TOOL MEMBERS

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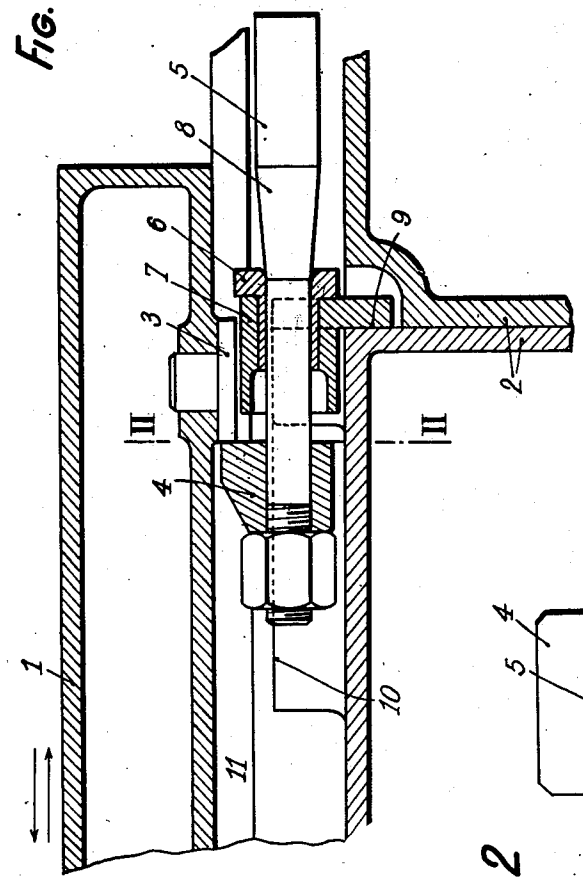
FIG. 1



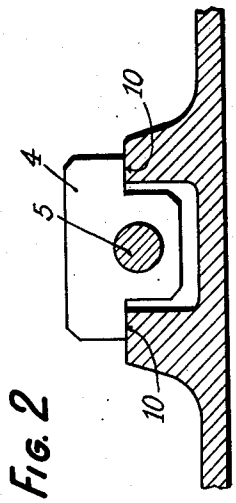


FIG. 2

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SAFETY STOPPING DEVICE FOR MOVABLE MACHINE-TOOL MEMBERS

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3 Claims. (Cl. 90—58)

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This invention relates to safety devices, and more particularly to safety devices for preventing a movable member such as a traversing table of a machine tool or the like from escaping from its slideways or tracks while moving at high speed in the event of its drive means being accidentally disengaged.

In machine-tools such as planing machines which include movable members or tables which in operation assume high-speed reciprocating traverse movements, the means for reversing the motion of the table at the end of its traverse are usually supplemented by a safety stopping device acting by electrical or mechanical braking effect. It can often occur that this safety stop device fails to operate, either because of a failure in electric power or due to misadjustment of the control stops thereof, or for any other reason. The movable member will then, under the momentum built up during its displacement, continue on its movements, and the driven element, such as a rackbar for example, may disengage and escape from the pinion constituting the driving element. Said movable member can then be shot out of its slideways at high speed and cause accidents.

It is an essential object of this invention to avert such accidents and for this purpose to cause a gradual breakage of the movable part to bring it completely to a stop, over a distance short enough to prevent said movable part from leaving its slideways.

With the above and other objects in view the invention essentially consists of taking up the kinetic energy stored in the moving member as soon as said member first becomes disengaged from its drive, by using said energy to draw a metal bar the physical characteristics and cross-sectional area of which are so selected as to be capable of using up said energy stored in the moving part, as determined by the mass and the speed of displacement thereof.

The invention will not be described for purposes of explanation and not of limitation as exemplified in a typical embodiment of the invention as applied to a planing machine. In the drawings:

Fig. 1 is a longitudinal vertical section of the improved safety device and the pertinent fragmentary parts of the planer; and Fig. 2 is a transverse cross-section on line II—II of Fig. 1.

As shown, the table 1 of the planer is movable over the slideways 11 of the planer frame 2. The table 1 is provided with a stop 3 adapted, in the event the table would overrun its normal traversing stroke, to abut against a part 4 rigidly secured to a bar 5 of circular cross-section. The bar 5 is formed towards the end thereof opposite from that engaging the part 4, with an enlarged diameter section which merges with the smaller diameter section of the bar through a frustoconical section 8. The bar as shown extends through a ring 6 made of very hard steel acting as a drawing-die. The ring 6 is backed against a support 7 which in turn is backed against a shoulder 9 of a machined section of the frame. To prevent the part 4 from being overturned, said part is supported as shown more clearly in Fig. 2, on two ribs 10 formed on the frame.

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The above-described device operates as follows: should the table 1 fail to stop normally at the end of its traversing stroke, its stop 3 will engage the part 4 and carry it with it. The bar or rod 5 is then drawn through the die member 6. The draft force necessary to thus draw the bar through the die produces the desired braking action and brings the movable assembly to a stop. The provision of the frustoconical connecting section insures that the braking action is satisfactorily gradual. Another advantage of this frustoconical section is to avert a sudden shock from occurring as the stop 3 engages the part 4.

After the safety device has operated, of course an exceptional occurrence, the bar 5 is replaced by a new one.

Rather than the specific arrangement shown, a reverse disposition could be used, with the die-and-bar assembly provided on the movable structure, and the stop 3 on the fixed frame.

The structural details illustrated and described have been given for indicative purposes only, and various modifications may be made therein, as in the relative shapes, sizes, and materials of the various part without exceeding the scope of the invention as defined in the ensuing claims.

What I claim is:

1. In a machine tool of the type including a carriage arranged to reciprocate between two limit positions, a safety device for yieldably arresting said carriage when overrunning one of its limit positions, a safety device for yieldably ar- a stationarily mounted die member, a drawable bar having a portion fitting through the opening of the die member and a portion wider than said opening, the fitting portion of the bar being extended through the die opening, a first dog fixedly secured to said fitting portion, and a second dog secured to said carriage for movement in uni-

son therewith and engageable with said first dog, engagement of the said dogs forcing the wider bar portion through the die opening thereby yieldably arresting the carriage, the said dogs being disposed in a relative position in which they are engageable for the purpose aforesaid only when the carriage overruns one of said limit positions.

2. A machine tool as defined in claim 1, wherein said wider portion of the metal bar is frusto-cone shaped, the narrow end of said frusto-conical shape being joined to the said fitting portion of the bar.

3. A machine tool as defined in claim 1, wherein the said die member is stationarily mounted on the machine tool.

PIERRE PÉGARD.

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