April 14, 1953 E. M. MAHARDY 2,634,625

SAFETY TREADLE

Filed April 5, 1949 2 SHEETS—SHEET 1

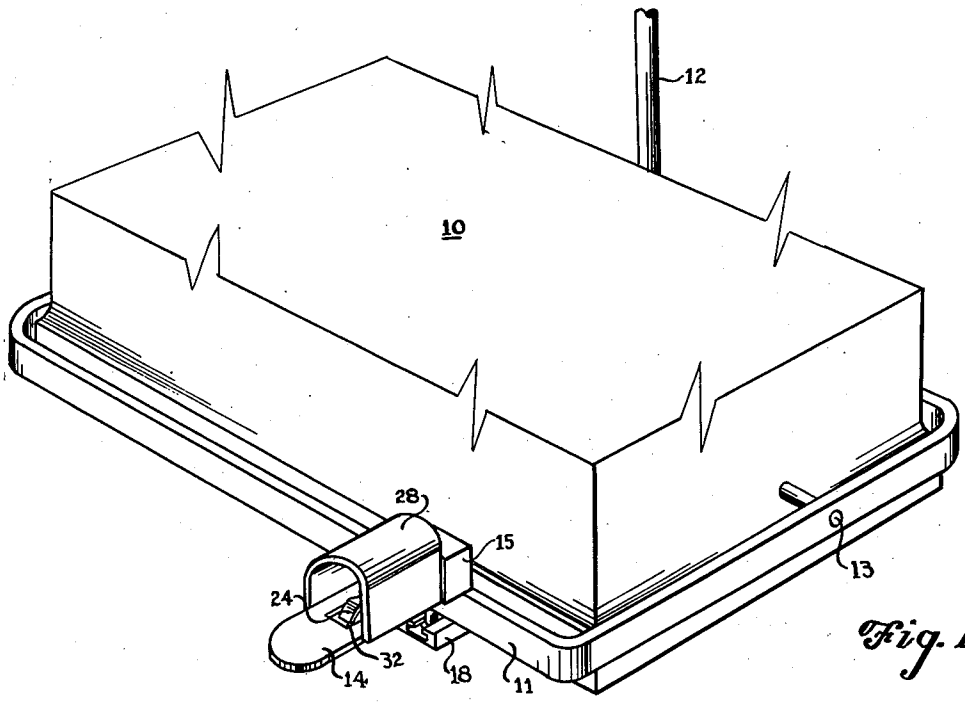


Fig. 1

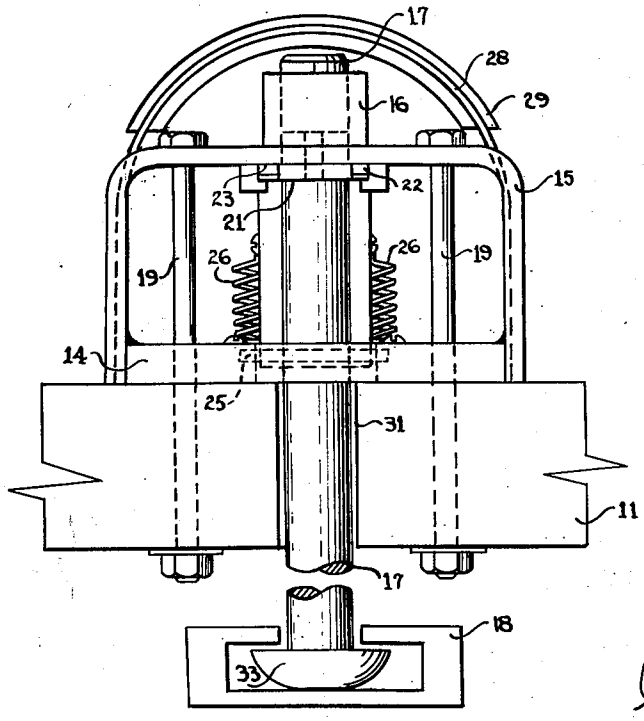


Fig. 2

INVENTOR.
EDWARD M. MAHARDY
BY
Hoodling and Krost
attys.

April 14, 1953 E. M. MAHARDY 2,634,625

SAFETY TREADLE

Filed April 5, 1949 2 SHEETS—SHEET 2

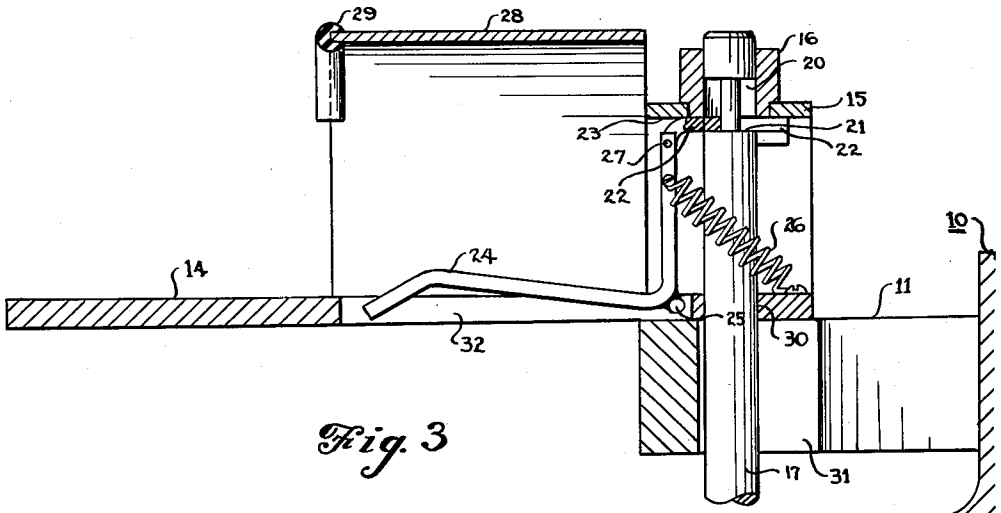


Fig. 3

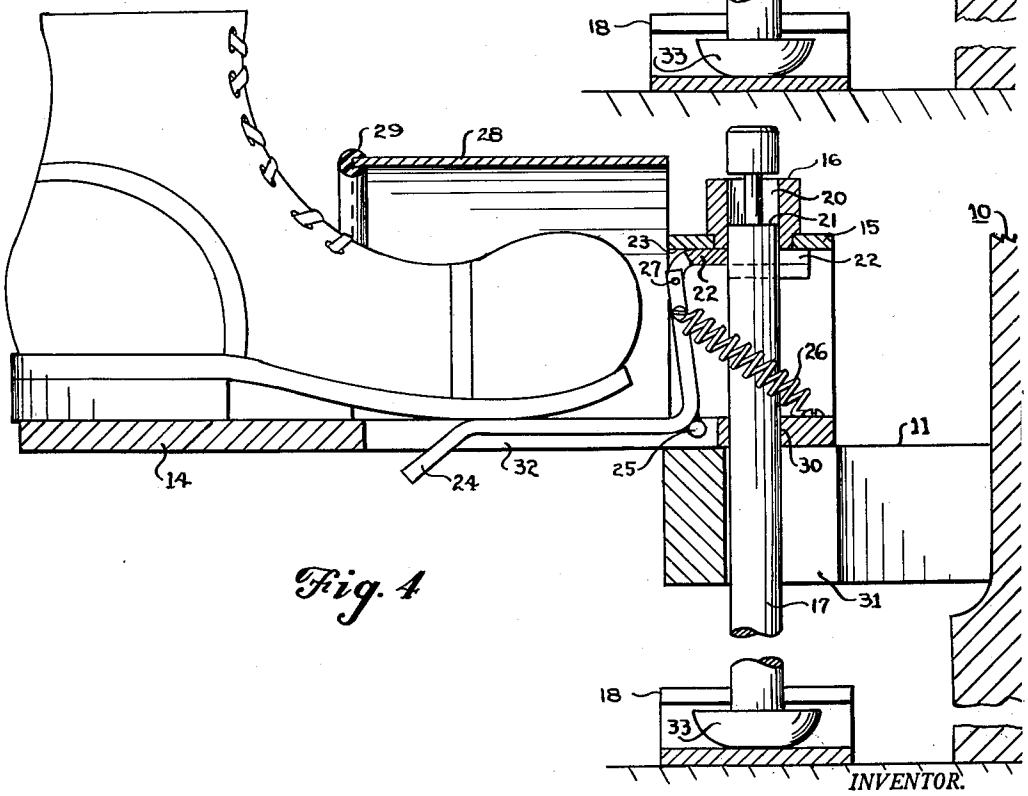


Fig. 4

INVENTOR.

EDWARD M. MAHARDY

BY

Woodling and Kroot
attys

Patented Apr. 14, 1953 2,634,625

UNITED STATES PATENT OFFICE

2,634,625

SAFETY TREADLE

Edward M. Mahardy, Frankfort, N. Y., assignor to Utica Drop Forge & Tool Corporation, a corporation of New York

Application April 5, 1949, Serial No. 85,680

3 Claims. (Cl. 74—539)

1

This invention relates to safety devices in general, and relates particularly to a safety treadle to operate the control treadle of a machine.

Many types of machines, among which are drop forge hammers and presses, are controlled by a foot treadle which the operator presses to initiate a work cycle of the machine. These treadles usually operate by a downward pressure of relatively small intensity in order that the operator may press the treadle many times during the day without undue fatigue.

Particularly in drop hammer forge operations, there is a great danger of unintentional operation of the machine by accidental pressure on the treadle, and more often by workpieces of considerable weight dropping on the treadle. The danger to workmen is evident.

Therefore, an object of this invention is to provide a safety device to prevent unintentional operation of a treadle controlled machine.

Another object of this invention is to provide a safety treadle to positively lock the control treadle until intentionally released.

A further object of this invention is to provide a lock for a treadle, and a hooded trigger release for the lock.

A still further object of this invention is to provide a lock for a treadle and a longitudinally extending opening with a release trigger for a lock residing within the opening in a position to be released by pressure of the toe portion of the operator's shoe.

Other objects and fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a broken away portion of a drop hammer base illustrating the control treadle of the hammer and a safety treadle constructed according to the principles of this invention;

Figure 2 is a rear view of the safety treadle illustrated in Figure 1;

Figure 3 is a longitudinal sectional view of the safety treadle in a locked position holding the control treadle against unintentional actuation; and

Figure 4 is a longitudinal sectional view illustrating the method of releasing the safety treadle for operation of the control treadle and machine.

The details of construction in the particular embodiment of the invention herein illustrated are best set forth in Figure 3 of the drawings. The fundamental features of this invention may easily be incorporated into a standard control treadle and employ parts of the standard control

2

treadle, but preferably the safety treadle will be constructed as an attachment to be placed on the control treadle. This is particularly true in drop hammer operation. The foot pedal of punch presses and similar machines may be constructed in accordance with the principles of this invention without the addition of auxiliary foot plates.

Particularly for drop hammer operation, the Figure 3 illustrates a base portion in a fixed position relative to the base 10 of a drop hammer, and a foot plate 14 reciprocably mounted on the base portion for movement relative to the base 10. The base portion in this particular embodiment, includes an upright member in the form of a post 17. A floor guide 18 is provided to give the post 17 a firm foundation because the floor surrounding drop hammers is generally of earth or rough boards. The post 17 is provided with a round base portion 33 in order to permit the post 17 to rock on the floor guide, and the floor guide 18 may be spiked to a wooden floor or welded to suitable brackets extending from the base 10.

In order to prevent binding between the foot plate 14 and the post 17, a long bearing is provided by passing the post 17 through an opening 30 in the foot plate 14, and providing a bearing 16 a distance away from the opening 30. A bracket 15, as best illustrated in the Figure 2, is welded, or otherwise suitably secured, to the foot plate 14 and carries the bearing 16, as illustrated. Thus, the foot plate 14 is bearinged on the post 17 by the opening 30 and the bearing 16.

The foot plate 14 is attached to a control treadle 11 of the hammer by means of bolts 19 which extend through the treadle 11, the foot plate 14, and the bracket 15, as best illustrated in the Figure 2. The bolts 19 are drawn tight and thus cause the treadle 11 and the foot plate 14 to move as one unit. That is, the treadle 11 cannot be moved without a corresponding movement of the foot plate 14, and conversely, any movement of the foot plate 14 will move the treadle 11. In the particular installation illustrated, a notch 31 is cut in the treadle 11 for the post 17. An alternate provision would be a hole of considerably larger size than the diameter of the post 17.

When the machine is not in operation, the treadle 11 and foot plate 14 are in the elevated position illustrated in Figure 3. In order to prevent unintentional operation of the machine, the safety treadle is locked in the position illustrated in Figure 3. The locking function is provided in this embodiment by a recess 20 on the post 17 to provide a lock surface or ledge 21. A two-finger catch member 22 serves as the lock portion of a

releaseable lock means including the catch 22 and release trigger 24. The lower surface 23 of the bracket 15 serves as a lock surface on the bearing portion of the foot plate 14. The trigger 24 is pivotally mounted on the foot plate 14 by pivot pin 25, and is thereby adapted to operate in a slot 32 in the foot plate 14. A pivot pin 27 interconnects the catch 22 and the release trigger 24. The catch 22 is urged into a locking position between the surfaces 21 and 23 by two springs 26, as illustrated in the Figures 2 and 3. Thus, the catch 22 will automatically lock the foot plate 14 against relative movement in relation to the post 17 upon alignment of the recess 20 with the catch 22 in the position illustrated in Figure 3. The trigger 24 is constructed to extend above the surface of the foot plate 14 when the catch 22 is urged into locking position between the surfaces 21 and 23. The catch 22 may be withdrawn from its locking position illustrated in Figure 3 to an unlocked position, as illustrated in Figure 4, by pressing the trigger 24 downwardly in relation to the foot plate 14.

In the Figure 1, the base 10 of a drop hammer is illustrated with the treadle 11 pivoted by means of pivot 13 to operate a control bar 12. Operation of the hammer is achieved by pressing downwardly on the treadle 11 any place forward of the pivot 13. However, the treadle 11 is locked against any movement when the post 17 and the foot plate 14 are in the relative position illustrated in Figure 3, because the catch 22 interlocks between the surfaces 21 and 23. Therefore, to operate the treadle 11 and initiate a work cycle in the hammer, the operator may place his foot upon the foot plate 14 and thereby press the treadle 24 into the position illustrated in Figure 4 to withdraw the catch 22 out of engagement between the surfaces 21 and 23. Thereafter, by continued downward pressure, the foot plate 14 may be moved downwardly on the post 17 and thus pivot the treadle 11 about the pivot 13 to operate the hammer. In hammer devices of this type, the control bar 12 is urged into non-operating position by means on the hammer itself. Therefore, after the operator releases the pressure from the foot plate 14, the treadle 11 will tend to pivot about the pivot 13 and move the foot plate 14 upwardly relative to the pin 17. The foot plate 14 will move freely upwardly until the catch 22 registers with the recess 20 and reengages between the surfaces 21 and 23 to lock the parts against relative movement.

Although a device as thus far described has been found to greatly minimize the accidental operation of the machine by unintentional pressure placed upon the control treadle, a further feature forms a part of this invention to render the safety treadle virtually foolproof against release of the foot plate 14 and actuation of the treadle 11 by falling workpieces and clumsy feet. This feature is a hood 28 over the trigger 24 to provide a protecting canopy and prevent unintentional forces from depressing the trigger 24. Thus, the hood 28 provides a longitudinally extending opening with the releasing trigger 24 residing within the opening in a position to be released by pressure of the toe portion of the operator's shoe inserted within the opening, but is shielded against all unintentional forces. Therefore, if a heavy piece of work falls from the operator's tongs, or if the operator or his helper accidentally presses downwardly with his foot upon the safety treadle while adjusting their dies, the foot plate 14 will not be released because such unintentional forces are shielded against contact with the trigger 24. A very deliberate insertion of the operator's foot into the longitudinal opening provided by the hood 28 is required in order to release the foot plate 14 and operate the machine.

Generally, the preferable material for the hood 28 is sheet steel. Therefore, when such material is used for the hood 28, it is preferable to provide a bumper 29 of rubber or other suitable soft material to avoid harm to the operator.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What is claimed is:

1. A safety device for a reciprocable foot operated control member of an industrial machine comprising, a post member, means to mount said post member adjacent the control member of a machine in a relative fixed position, a pressure receiving plate member, means for securing said pressure receiving plate member to said control member, said plate member thereby having a reciprocable path of movement between a first and second limit, said post member having one latch lock surface, a catch carried by said plate member, said latch lock surface and catch positioned to engage only when the plate is substantially at said first limit of movement, said plate having an opening therethrough, a trigger member pivotally mounted within the confines of said plate in said opening, means drivingly connecting said trigger to said catch, said trigger having a first pivotal position extending partially above the surface of said plate, a second position flush with the surface of said plate, resilient means urging said trigger means and catch to said first position, said trigger means in said first position adapted to intercept a force directed toward said plate to thereby be pivoted to said second position, and upon movement of said trigger to said second position the plate and control member are freed of said post and free to move without restriction throughout the entire range between said first and second limits.

2. A safety device for a reciprocable foot operated control member of an industrial machine comprising, a post member, means to mount said post member in a relatively fixed position, a pressure receiving plate member, means mounting said plate member for movement in a reciprocable path between a first and second limit, said post member having one latch lock surface, a catch carried by said plate member, said latch lock surface and catch positioned to engage only when the plate is substantially at said first limit of movement, said plate having an opening therethrough, a trigger member pivotally mounted within the confines of said plate in said opening, means drivingly connecting said trigger to said catch, said trigger having a first pivotal position extending partially above the surface of said plate, a second position flush with the surface of said plate, resilient means urging said trigger means and catch to said first position, said trigger means in said first position adapted to intercept a force directed toward said plate to thereby be pivoted to said second position, and upon movement of said trigger to said second

position the plate and control member are freed of said post and free to move without restriction throughout the entire range between said first and second limits.

3. A safety device for a reciprocable foot operated control member of an industrial machine comprising, a pressure receiving plate member secured to said control member and thereby operable through a reciprocable path between a first and second limit, a post member extending from said plate to a fixed surface, said post member having one latch lock surface, a catch carried by said plate member, said latch lock surface and catch positioned to engage only when the plate is substantially at said first limit of movement, said plate having an opening therethrough, a trigger member pivotally mounted within the confines of said plate in said opening, means drivingly connecting said trigger to said catch, said trigger having a first pivotal position extending partially above the surface of said plate, a second position flush with the surface of said plate, resilient means urging said trigger means and catch to said first position, said trigger means in said first position adapted

to intercept a force directed toward said plate to thereby be pivoted to said second position, and upon movement of said trigger to said second position the plate and control member are freed of said post and free to move without restriction throughout the entire range between said first and second limits.

EDWARD M. MAHARDY.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
579,019	Smith	Mar. 16, 1897
1,316,727	Koressios	Sept. 23, 1919
1,375,760	Piaser	Apr. 26, 1921
1,507,247	Nelson	Sept. 2, 1924
1,509,676	Lawrence	Sept. 23, 1924
1,709,842	Dodge	Apr. 23, 1929
1,814,880	Young	July 14, 1931
2,322,585	Ojalvo	June 22, 1943

FOREIGN PATENTS

Number	Country	Date
112,485	Great Britain	Jan. 8, 1918