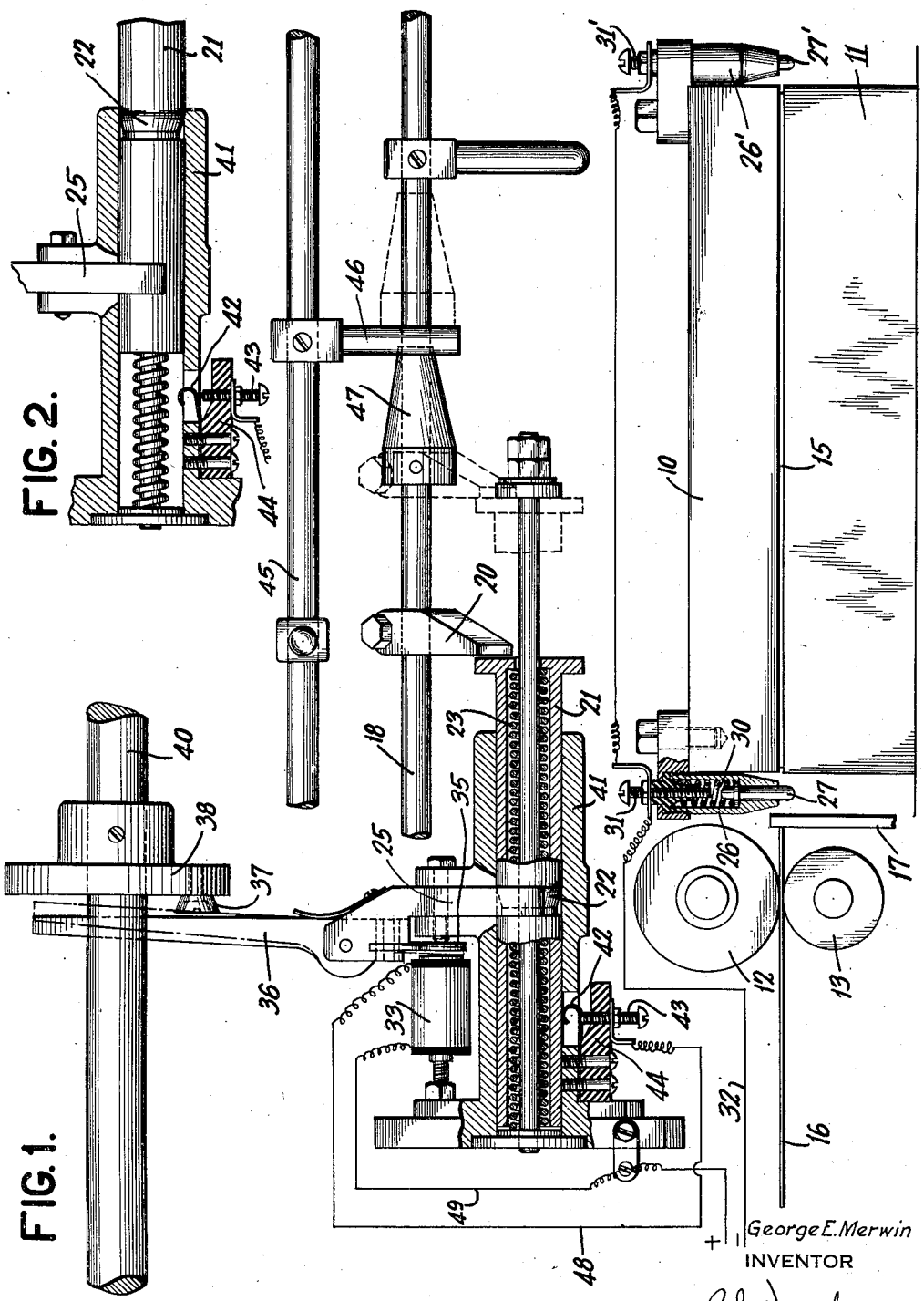
April 5, 1938. G. E. MERWIN 2,113,538

APPARATUS FOR AUTOMATICALLY STOPPING A PANEL PRESS

Filed June 19, 1936 2 Sheets-Sheet 1



George E. Merwin
INVENTOR

BY R. J. Dearborn
ATTORNEY

April 5, 1938. G. E. MERWIN 2,113,538

APPARATUS FOR AUTOMATICALLY STOPPING A PANEL PRESS

Filed June 19, 1936 2 Sheets-Sheet 2

FIG. 3.

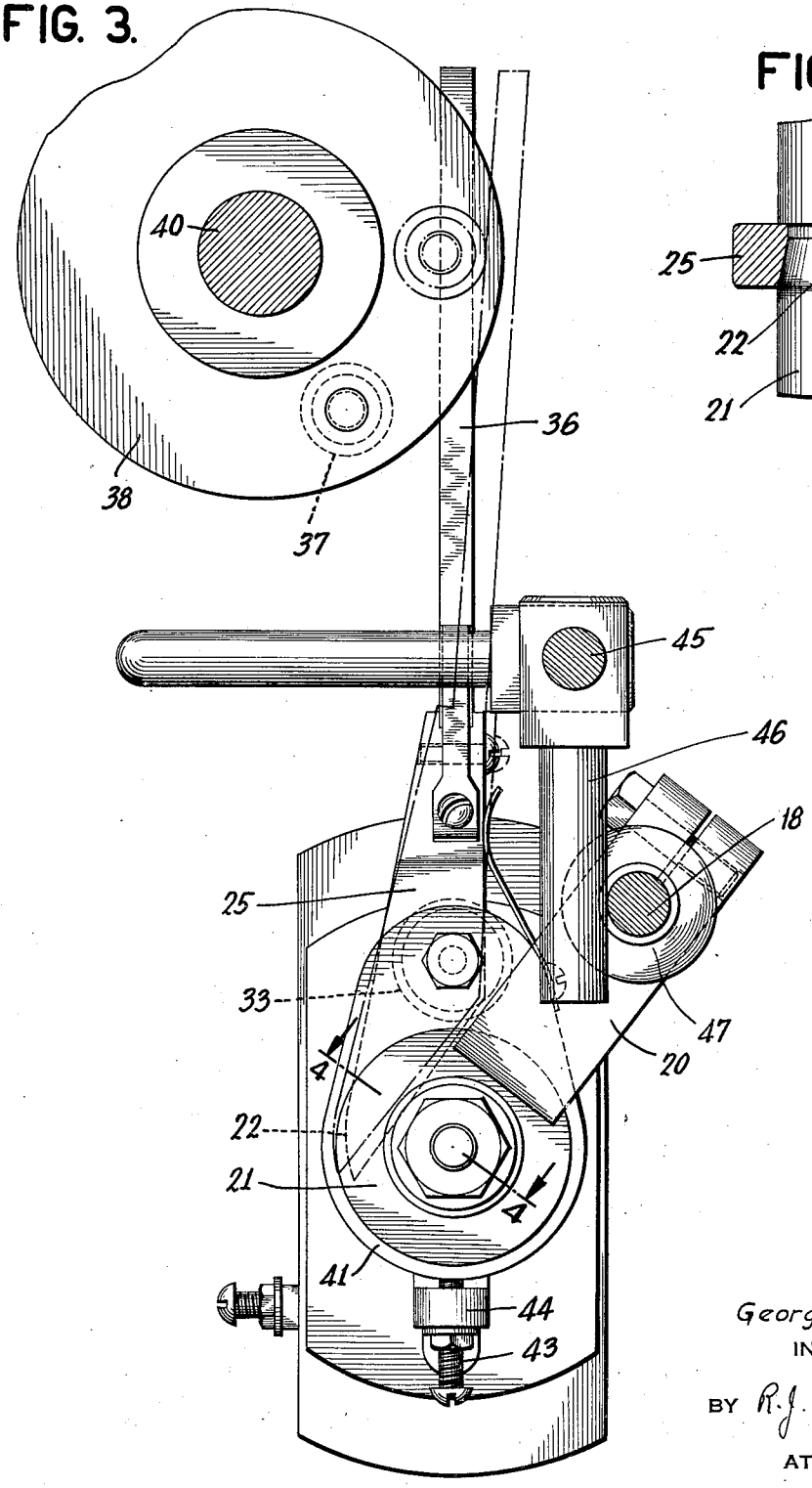


FIG. 4.

George E. Merwin
INVENTOR

BY R. J. Dearborn
ATTORNEY

Patented Apr. 5, 1938

2,113,538

UNITED STATES PATENT OFFICE

2,113,538

APPARATUS FOR AUTOMATICALLY STOPPING A PANEL PRESS

George Eaton Merwin, Port Arthur, Tex., assignor to The Texas Company, New York, N. Y., a corporation of Delaware

Application June 19, 1936, Serial No. 86,028

3 Claims. (Cl. 192—127)

This invention relates to devices for automatically stopping the operation of continuously running machinery and has particular reference to such a device for use with a panel press of the type used in forming such things as metal can ends, sides and other similar articles.

It is an object of the present invention to provide a device of the type above mentioned which is automatic in operation and which will promptly stop the operation of the panel press or such other machines as it may be arranged to control. Used in connection with a panel press operating upon tin plate the device is capable of cutting down to a minimum the amount of tin plate spoilage caused by the press. Furthermore, when so used, the device increases production by decreasing and shortening the delays due to wrecks and eliminates the damage which would otherwise be done to the dies by such wrecks. The use of devices embodying this invention also increases the safety with which the machines which it controls may be operated.

Other objects, features and advantages of the present invention will appear more fully from the following description when considered in connection with the accompanying drawings, in which:

Fig. 1 is a side view, partially in section, of a press stop embodying the present invention, the safety switch being shown in closed position,

Fig. 2 is a partially sectional detail view of a portion of the mechanism shown in Fig. 1, showing the safety switch in open position,

Fig. 3 is an enlarged end view of the device shown in Fig. 1, and

Fig. 4 is a section taken on line 4—4 of Fig. 3.

For the purpose of illustration the automatic stop device which constitutes the subject matter of the present invention is illustrated in the drawings and will be described in conjunction with a panel press, the operation of which is by any suitable means such as electric motor or by a belt from a conveniently located power shaft controlled by the stop device.

By referring to the drawings it will be seen that a punch 10 and die 11, both of conventional design, are arranged to operate upon tin or other metal plate fed to the press by an idler feed roll 12 and a driven feed roll 13. A sheet of tin plate 15 is shown accurately positioned in the press between the die 11 and the punch 10. Another sheet of tin plate 16 is shown ready to be fed to the press as soon as plate 15 is removed, but temporarily held in check by a mechanical stop 17.

The automatic press stopping device which is electrically operated is mounted inside the automatic feed casting of the press parallel to a starting lever shaft 18 which controls the operation of the press. A dog 20 is secured on shaft 18, preferably by clamping, and is so arranged as to extend partially over the head of a stop plunger 21 which is formed with an annular groove 22. When the panel press is started the starting lever shaft 18 is manually or otherwise moved to the left, as viewed in Fig. 1. As shaft 18 is moved to the left the dog 20 strikes against the plunger 21 and compresses a plunger spring 23. When the plunger 21 is in this compressed position a latch 25 is free to drop into the groove 22 in plunger 21 to hold the plunger in this position, which is the normal operating position during the normal operation of the press.

Two electric switches 26 and 26' are mounted on the punch 10, switch 26 being positioned at the front end of the punch and switch 26' being at the rear end. The switches are each provided with round-nose plungers or contact points 27 and 27', respectively, which are movable longitudinally through the switch bodies or casings 28 and 28', respectively. The plungers 27 and 27' are maintained in normal operating position, that is, extending to the maximum outside of their respective casings, by means of compression springs 30 and 30'.

The switches are each provided with a binding post 31 and 31', respectively, through which connection is made by means of a wire 32 to an electric battery (not shown) or other source of electricity. The binding posts 31 and 31' are each insulated from their respective casings by suitable plugs 33 and 33' which also serve to insulate the springs 30, 30' from the casings.

The switches 26, 26' are so positioned that the round-nose plungers 27, 27' normally extend about ¼ inch below the lower surface of the punch 10. As shown in Fig. 1, the sheet of tin plate 15 is properly positioned on the die 11 for the stamping operation and is located midway between the switches 26 and 26'. The sheet of tin plate 16 is shown in the last position before entering the die 11 and is being held against stop 17 by the action of feed rolls 12 and 13. During operation of the press the punch 10 moves downward and switches 26 and 26', which are secured to it, move downward, switch 26 moving into the gap between the two sheets of tin plate 15 and 16.

If for any reason during the operation of the press a sheet should fail to completely enter die 11 and punch 10, the plunger 27 of switch 26 would strike against the sheet 15. This would

cause the plunger 27 to move upwardly against the action of the spring 30 and make contact with the lower end of the binding post 31, thus completing the electrical circuit through wire 32 and the plate 15 which is grounded through the press. The same result would be obtained at any time that the sheet 15 might pass beyond the correct position between the die 11 and punch 10 by reason of the striking of the sheet against plunger 27' of switch 26', or in the event that the plate is not completely ejected from the press.

Whenever contact is made by either plunger 27 or 27' with its respective binding post 31 or 31' an electrical circuit is established and an electro-magnet 33 in the circuit is energized so that it attracts and pulls to it an armature 35 which is suitably connected to a pivoted lever 36. The lever 36 is thereby caused to swing into the path of a crank pin 37 which is mounted on and normally rotates with a crank 38 secured on a shaft 40. When the crank pin 37 strikes the armature lever 36 the latch 25 is lifted from its normal position in the groove 22 in the plunger 21. This releases the spring 23 which until now has been compressed, and when so released the spring acts upon plunger 21 which is moved to the right, as viewed in Fig. 1, until it strikes the dog 20 on shaft 18 which is moved to the stop position, thereby stopping the press.

A safety switch 44 is located on the bottom of frame 41. The switch includes a spring 42 which is maintained in contact with an insulated binding post 43 so long as the plunger 21 is in the running position shown in Fig. 1. When the latch 25 is released and the plunger 21 moves to the right to the stop position shown in Fig. 2, the switch spring 42 no longer contacts the insulated binding post 43. The circuit is thus broken and, accordingly, the possibility of burning out the batteries (not shown) from possible continuous contact is eliminated.

A lock shaft 45 is arranged parallel with the starting lever shaft 18 and is provided with a lock pawl 46. When the press is stopped pawl 46 drops behind a conically shaped dog 47 on the starting lever shaft 18, making it impossible to start the press without first lifting the pawl 46 to clear the dog 47. The pawl 46 is manually operable and when it is desired to start the press the pawl is lifted by one hand to rock the lock shaft 45 while the other hand is used to operate the starting lever 18. This necessitates the use of both hands in starting the press and eliminates the danger of starting the press with one hand while the other is in some dangerous position.

Assuming that a sheet of tin plate has come in contact with plunger 27 of switch 26 and has forced the plunger into contact with binding post 31 while the plunger 21 is locked in what may be termed the running position, thereby holding spring 42 in contact with binding post 43 and closing that part of the circuit, then the electrical circuit is as follows:

A wire 49 connects one end of the electro-magnet 33 with a battery (not shown). The opposite end of electro-magnet 33 is connected by a wire 48 with binding post 43 of switch 44, so that the current flows to and through the solenoid and to the binding post 43. From this point the current passes through spring 42 to the frame of the machine when the plunger 21 is in the stop position, and from the frame through the tin plate to the plunger 27 of switch 26, and from there through the binding post 31 to wire 32 and to the battery, thus completing the circuit. Thus it will be apparent that at any time that a sheet of tin plate is incorrectly positioned in the press contact is made with either switch 26 or 26' and this contact closes an electric circuit which actuates the stop device and quickly stops the operation of the press.

Obviously, many modifications and variations of the invention herein set forth may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

I claim:

1. The combination with a power driven press for forming metal sheets, of means for automatically shutting off the supply of power to the press when a sheet is incorrectly positioned therein comprising a switch, a spring-actuated plunger normally positioned to permit continuous operation of the press and to close said switch when in said normal position, a latch for holding said plunger in normal position, a second switch adapted to be closed by contact with a sheet incorrectly positioned in the press to complete an electric circuit, and an electro-magnet adapted to be energized upon the closing of said second named switch for releasing the latch to permit the plunger to move to shut off the power supply to the press and to open the first named switch to break the electrical circuit.

2. The combination with a power press for forming metal sheets, of means for automatically shutting off the supply of power to the press when a sheet is incorrectly positioned therein comprising a spring-actuated plunger adapted to be moved to a normal running position to permit continuous operation of the press, a latch adapted to engage said plunger to hold it in said normal position, a lever pivotally connected to said latch and adapted to contact and stop the rotation of a power shaft, a switch adapted to be closed by contact with a sheet incorrectly positioned in the press to complete an electric circuit, an electro-magnet adapted to be energized upon the closing of said switch, means responsive to the energizing of said electro-magnet for actuating said lever to contact said power shaft and for simultaneously releasing said latch to permit the plunger to move to a stop position, and means for securing said plunger in said stop position until again moved to the normal running position.

3. The combination with a power driven press for forming metal sheets, of a rotatable and longitudinally movable starting lever shaft adapted to be moved manually to a normal operating position, a plurality of dogs secured on said shaft in spaced relation, a spring pressed plunger adapted to contact one of said dogs to actuate said shaft to a non-operating position, means for maintaining said plunger in normal operating position, means for releasing said plunger when a sheet is incorrectly positioned within the press to actuate said shaft to a stop position, a pawl adapted to engage one of said dogs to hold the shaft in non-operating position until again moved manually to the operating position.

GEORGE EATON MERWIN.