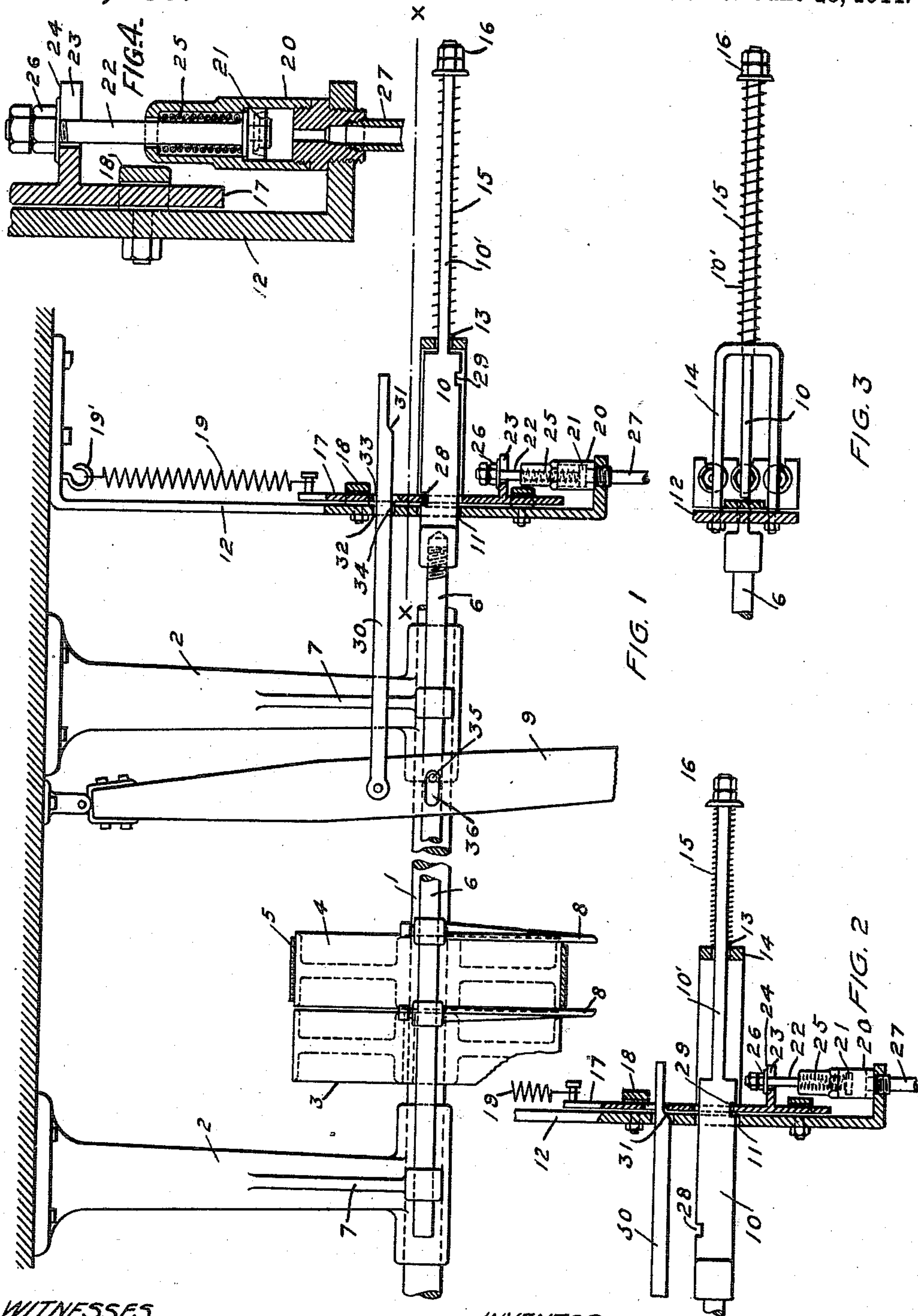


J. C. MELOON.
SAFETY DEVICE.
APPLICATION FILED JAN 5, 1906.

994,860.

Patented June 13, 1911.



WITNESSES,
James H. Thurston
Catherine G. Bradley.

INVENTOR,
Jonathan C. Meloon,
BY *Wilmarth C. Thurston,*
ATTY.

UNITED STATES PATENT OFFICE.

JONATHAN C. MELOON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO GENERAL FIRE EXTINGUISHER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SAFETY DEVICE.

994,860.

Specification of Letters Patent. Patented June 13, 1911.

Application filed January 5, 1906. Serial No. 294,726.

To all whom it may concern:

Be it known that I, JONATHAN C. MELOON, of the city and county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Safety Devices; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The invention relates to a safety device for use in connection with machine tools, such for example as a tapping machine in which one or more of the operations of the machine is effected or controlled by fluid pressure.

In machines of this character it is desirable that the machine should not be started unless the fluid pressure is up to the required operating point, as if it were the parts, the operation of which is effected or controlled by fluid pressure, would fail to operate when the time for their operation arrived, and in a case where other parts of the machine were operated in some other manner or by some other power, damage to the machine, or to the work being operated upon, would be likely to result, if the fluid pressure operated or controlled parts should thus fail to operate at the proper time.

To insure the proper operation of machines of this character is the object of the present invention.

To this end one feature of the invention consists in providing means whereby the starting of the machine will be prevented, if the fluid pressure is below the predetermined operating point.

Another feature of invention consists in providing means whereby, whenever the fluid pressure falls below the predetermined point while the machine is in operation, the machine will be automatically stopped.

The invention further consists in the construction and combination of parts hereinafter described and claimed.

Referring to the drawings, Figure 1 is an elevation, partly in section, of an overhead countershaft with fast and loose pulleys, and showing the safety device applied to the shipper bar; Fig. 2 is an elevation, partly in section, of the safety device showing the parts in a different position; Fig. 3 is a section on the line $x-x$, Fig. 1; Fig. 4 is a

section on an enlarged scale of a portion of the safety device.

1 is the countershaft journaled in the hangers 2 and provided with the fast and loose pulleys 3 and 4, and 5 is the driving belt for the machine to be operated. The shipper bar 6 is mounted to slide in the brackets 7 and is provided with the adjustable arms 8 for engaging the belt 5, and with the lever 9 for operating the same, all of these parts being of the usual construction.

Secured to the end of the shipper bar 6 is a slide 10 extending through a slot 11 in a bracket 12, and having a reduced end portion 10' extending through a slot 13 in the bracket 14 which is secured to the bracket 12. Mounted on the reduced end portion 10' is a spring 15, one end of which bears against the bracket 14 and the other end against a nut 16 secured to the end of said reduced portion, and by means of which nut the tension of said spring may be adjusted. The slide 10, instead of being made separate from the shipper bar, may be made integral therewith if desired.

A latch-bar 17 is arranged to slide in guides 18 upon the bracket 12. Connected to one end of said latch-bar is a spring 19, the other end of said spring being connected to the hook 19', said spring serving, when permitted to do so, to move the latch-bar in one direction. Said latch-bar 17 is moved in the opposite direction by the following means: Secured to the bracket 12 is a cylinder 20 in which is a piston 21 provided with a piston-rod 22 extending through the head of the cylinder 20 and through a slot 23 in the arm 24 of the latch-bar 17. A spring 25 encircles the rod 22, one end of which spring bears against the piston 21 and the other end against the head of the cylinder 20.

The end of the rod 22 is screw-threaded and provided with a nut 26 which engages the arm 24 on the latch-bar, the construction being such that when the piston is moved in one direction by the spring 25, the latch-bar will be moved with said piston, but when the piston is moved in the opposite direction by the fluid pressure, the piston may move without moving the latch-bar, which latch-bar is then moved by the spring 19. The piston rod 22 being screw-threaded, the nut 26 may be adjusted as desired to vary the

tension of the spring 25 so that said spring will operate the piston 21 when the fluid pressure falls below any desired predetermined point.

5 A fluid pressure pipe 27 opens into the cylinder 20 on the underside of the piston 21, said pipe 27 being a branch from the fluid pressure pipe connected to the machine to be operated. The slide 10 is provided with a
10 notch 28 on its upper side near one end and with a notch 29 on its lower side near the opposite end for the engagement of the latch-bar 17.

Pivoted to the shipper lever 9 is an arm 30
15 provided with a cam surface 31. The free end of the arm 30 extends through slots 32 and 33 in the bracket 12 and latch-bar 17 respectively. The latch-bar 17 is provided with a cam surface 34 which lies in the path
20 of the cam surface 31 when the latch-bar is in its raised position, as shown in Fig. 2. When the lever 9 and the arm 30 are moved to the right in said figure the engagement of the cam surface 31 with the cam surface
25 34 will serve to move the latch-bar downward and out of the notch 29. For a purpose to be hereinafter described lost motion between the lever 9 and the shipper-bar is provided by having the pin 35 on said lever
30 enter an elongated slot 36 in the shipper-bar, as shown in Fig. 1.

The operation of the device is as follows: Assuming the parts to be in the position shown in Fig. 1, and in which the driving
35 belt is on the loose pulley, it will be seen that the latch-bar 17 is in engagement with the notch 28 in the slide 10, and that, so long as the latch-bar remains in engagement with said notch, the shipper-bar cannot be moved
40 and the belt cannot therefore be shifted to the fast pulley and the machine cannot be started. With the understanding that the tension of the spring 25 is such that it will prevent the movement of the piston 21 by
45 the fluid pressure until such fluid pressure has reached the point required for operating the machine, it will be further seen that the latch-bar will be retained in engagement with said notch 28 by the action of the
50 spring 25 until the fluid pressure has reached the required point, and that therefore the machine cannot be started so long as the fluid pressure remains below this point. When, however, the fluid pressure is raised
55 to the required point, such fluid pressure acting upon the piston 21 will serve to move said piston against the tension of the spring 25 and thereby move the nut 26 out of engagement with the arm 24 on the latch-bar
60 17, thus leaving said latch-bar free to be moved by the spring 19 in the direction to withdraw said latch-bar from the notch 28 and so that the shipper-bar will then be free to be moved to shift the belt to the fast
65 pulley and to start the machine. When the

shipper-bar is thus moved to shift the belt to the fast pulley, the spring 15 is compressed and put under tension, and it is therefore necessary that the shipper-bar should be retained in this position against
70 the action of said spring 15 until it is desired to again stop the machine. In the construction shown the shipper-bar is retained in position with the belt on the fast pulley, and against the action of the spring 15, by
75 the engagement of the latch-bar with the notch 29 in the slide 10, which said notch 29 as the shipper-bar is moved to shift the belt on to the fast pulley is brought into line with the latch-bar, and so that the continued
80 action of the spring 19 on said latch-bar will serve to move it into engagement with said notch 29 and thereby lock said shipper-bar in position with the belt on the fast pulley and against the action of the spring 15.
85

In order to shift the belt back to the loose pulley to stop the machine it is necessary that the shipper-bar should be first unlocked by withdrawing the latch-bar from the notch 29. Assuming that the fluid pressure re-
90 mains up to the required point and is at such required point at the time it is desired to stop the machine, the shipper-bar in such case is to be moved to shift the belt on to the loose pulley by means of the hand-lever 9.
95 By reason of the lost motion between said lever and shipper-bar, the first movement of said lever will, through the action of the cam surface 31 on the cam surface 34, serve to move the latch-bar out of the notch 29, there-
100 by unlocking the shipper-bar, and the further movement of the lever 9 will move the shipper-bar to shift the belt on to the loose pulley, or if desired the lever may be moved by hand only far enough to unlock
105 the shipper-bar, leaving said bar to be moved by the spring 15. It sometimes happens, however, that for some reason the fluid pressure may fall below the required operating point, and if this should happen, it is desirable
110 that the machine should be automatically stopped. The automatic stopping of the machine in such event is effected as follows: Whenever the fluid pressure falls below the required point, the fluid pressure on the piston 21 will cease to overcome the tension of
115 the spring 25, and said spring, the tension of which is greater than the tension of the spring 19, will then serve to move the latch-bar out of engagement with the notch 29,
120 whereupon the spring 15 will serve to automatically move the shipper-bar to shift the belt on to the loose pulley and thereby automatically stop the machine.

With the construction above described, as
125 will be seen, if, when it is desired to start the machine, the fluid pressure is below the required operating point, the machine cannot be started, because the shipper-bar will in such case be locked in position with the belt
130

on the loose pulley, and the shipper-bar will remain locked in this position so long as the fluid pressure remains below the predetermined point, and the machine therefore cannot be started until the fluid pressure has been raised to such point.

It will be further seen that, if at any time while the machine is in operation, the fluid pressure should fall below the predetermined point, the machine will be automatically stopped, and must remain stopped until the pressure has been again raised to the required point.

It will be further seen that if it be desired to stop the machine when the fluid pressure has not fallen below the predetermined point this may be done by means of the hand-lever 9, the movement of which through the action of the cam surface 31 will serve to move the latch-bar out of the notch 29 and thus permit the shipper-bar to be moved either by the lever 9 or by the spring 15 to shift the belt on the loose pulley.

If desired, instead of employing the spring 19 to move the latch-bar in one direction, the connection between the piston-rod 22 and the latch-bar may be such that the latch-bar will be moved by and with the piston in both directions, being moved in one direction by the action of the spring 25 upon the piston and in the other direction by the action of the fluid pressure upon the piston. In such case the spring 19 may be omitted. It is preferred, however, to make the connection between the piston and latch-bar a loose connection, and to employ the spring 19, and so that, while the latch-bar is moved in one direction by the spring 25 acting on the piston, it will be moved in the opposite direction by the spring 19, for the reason that with such construction it will not be necessary, when the lever 9 is moved to the right in the drawings, for the cam surface 31 to overcome the fluid pressure on the piston, but only the tension of the spring 19, in order to move the latch-bar out of the notch 29.

It will be understood that in place of the belt-shipper mechanism shown and described other forms of starting and stopping mechanism may be employed as substitutes therefor so far as the main features of the invention are concerned.

What I claim as my invention and desire to secure by Letters Patent is:

1. The combination, with manually operated starting mechanism of a fluid pressure controlled machine, of means for preventing the movement of said starting mechanism when the fluid pressure is below a predetermined point, substantially as described.

2. The combination, with manually operated starting mechanism of a fluid pressure controlled machine, of means controlled

by said fluid pressure for preventing the movement of said starting mechanism when the fluid pressure is below a predetermined point, substantially as described.

3. The combination, with the starting mechanism of a fluid pressure controlled machine, of means for preventing the operation of said starting mechanism when the fluid pressure is below a predetermined point, and means for automatically releasing said starting mechanism when the fluid pressure reaches the predetermined point, substantially as described.

4. The combination, with driving mechanism for a fluid pressure controlled machine, of a stopping mechanism therefor, means for automatically operating said stopping mechanism when said fluid pressure falls below a predetermined point, and means for preventing the starting of said driving mechanism so long as said fluid pressure remains below said point.

5. The combination, with the starting and stopping mechanism of a fluid pressure controlled machine, of means for automatically operating the stopping mechanism when the fluid pressure falls below a predetermined point, and means for preventing the operation of the starting mechanism while the fluid pressure remains below said predetermined point, substantially as described.

6. The combination, with the starting and stopping mechanism of a fluid pressure controlled machine, of means for automatically operating the stopping mechanism when the fluid pressure falls below a predetermined point, means for preventing the operation of the starting mechanism while the fluid pressure remains below said predetermined point, and means for automatically releasing said starting mechanism when the fluid pressure again reaches the predetermined point, substantially as described.

7. The combination, with the stopping mechanism of a fluid pressure controlled machine, of means for preventing the automatic operation of said stopping mechanism while the fluid pressure remains at the predetermined point, and means for automatically releasing and operating said stopping mechanism when the pressure falls below a predetermined point, substantially as described.

8. The combination, with the stopping mechanism of a fluid pressure controlled machine, of means for preventing the operation of said stopping mechanism, means for automatically releasing said stopping mechanism when the pressure falls below a predetermined point, and hand operated means for releasing said stopping mechanism while the pressure remains at the predetermined point, substantially as described.

9. The combination, with the shipper-bar of a fluid pressure controlled machine, of

means automatically controlled by the fluid pressure for locking said shipper-bar against movement when the fluid pressure is below a predetermined point.

5 10. The combination, with the shipper-bar of a fluid pressure controlled machine, of a latch-bar adapted to engage said shipper-bar, and means automatically controlled by the fluid pressure to operate said latch-bar
10 to lock said shipper-bar when the fluid pressure is below a predetermined point.

11. The combination, with a shipper bar, of means for automatically operating said shipper-bar in one direction, and a fluid
15 pressure controlled latch-bar adapted to engage and hold the shipper-bar in position after it has been operated, substantially as described.

12. The combination, with the shipper-bar
20 of a fluid pressure controlled machine, of means automatically controlled by the fluid pressure for locking said shipper-bar against movement when the fluid pressure is below a predetermined point and for releasing said
25 shipper-bar when the fluid pressure is raised to the predetermined point.

13. The combination, with the shipper-bar of a fluid pressure controlled machine, of a latch-bar adapted to engage said shipper-bar, means automatically controlled by the
30 fluid pressure to operate said latch-bar to lock said shipper-bar when the fluid pressure is below a predetermined point and to operate said latch-bar to unlock said shipper-bar when the fluid pressure is raised
35 to the predetermined point.

14. The combination, with the shipper-bar of a fluid pressure controlled machine, of a latch-bar adapted to engage said shipper-bar, a spring normally acting upon said
40 latch-bar to lock said shipper-bar when the pressure is below a predetermined point, and means automatically controlled by the fluid pressure to operate said latch-bar against the action of said spring to unlock
45 said shipper-bar when the pressure is raised to the predetermined point.

15. The combination, with a shipper-bar, of means for automatically locking said

shipper-bar in position, fluid pressure controlled means for automatically unlocking
50 said shipper-bar, and means for automatically moving said shipper-bar from said position, substantially as described.

16. The combination, with a shipper-bar,
55 of a latch-bar adapted to engage and disengage said shipper-bar, a spring for operating said latch-bar in one direction, and a fluid pressure controlled spring for operating the latch-bar in the other direction,
60 substantially as described.

17. The combination, with a shipper-bar, of a hand operating lever, a latch-bar adapted to engage said shipper-bar, and means
65 operated by the hand operating lever to disengage said latch-bar from the shipper-bar, substantially as described.

18. The combination, with a shipper-bar, of a hand operating lever, a latch-bar automatically operated to engage and hold said
70 shipper-bar, and means operated by the hand operating lever to disengage said latch-bar from the shipper-bar, substantially as described.

19. The combination, with a shipper-bar,
75 of a hand operating lever, a fluid pressure controlled latch-bar normally held in engagement with said shipper-bar, and means operated by the hand-operating lever to disengage said latch-bar from the shipper-bar,
80 substantially as described.

20. The combination, with a shipper-bar, of a hand operating lever, a latch-bar, and an arm pivoted to said hand operating lever and adapted to engage and operate said
85 latch-bar, substantially as described.

21. The combination, with a shipper-bar, of a hand operating lever, a latch-bar provided with a cam surface, and an arm pivoted to said hand operating lever and provided with a cam surface adapted to engage
90 the cam surface on said latch-bar, substantially as described.

JONATHAN C. MELOON.

Witnesses:

J. H. THURSTON,

W. H. THURSTON.