J. A. HICKS.

WRINGER SAFETY DEVICE.

APPLICATION FILED MAR. 21, 1917.

1,277,073.

Patented Aug. 27, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

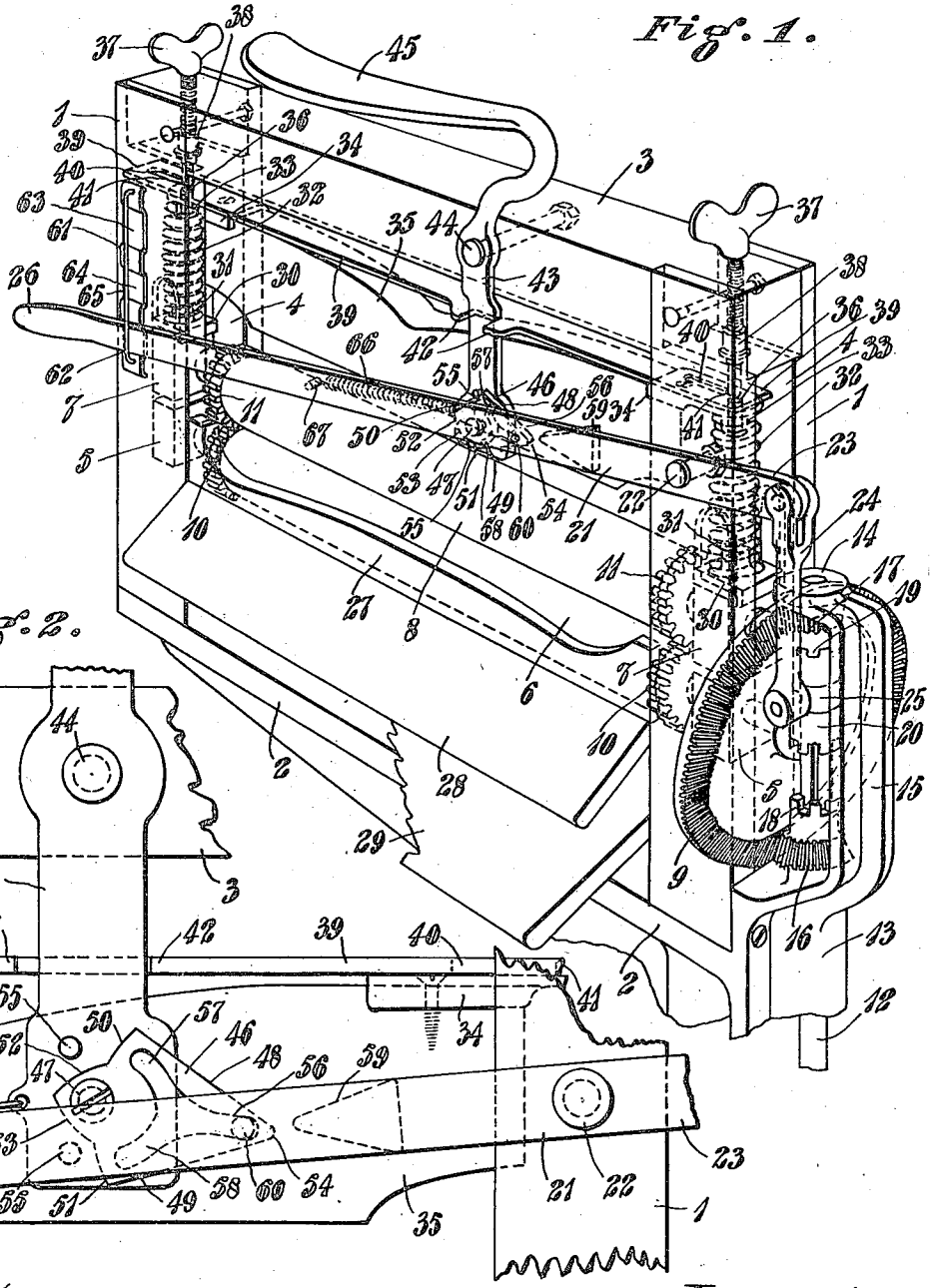


Fig. 2.

Witnesses:
Clarence Forbes
Miles L. Fay

Inventor
James A. Hicks
By James N. Ramsey
Attorney.

J. A. HICKS.

WRINGER SAFETY DEVICE.

APPLICATION FILED MAR. 21, 1917.

1,277,073.

Patented Aug. 27, 1918.

2 SHEETS—SHEET 2.

Fig. 3.

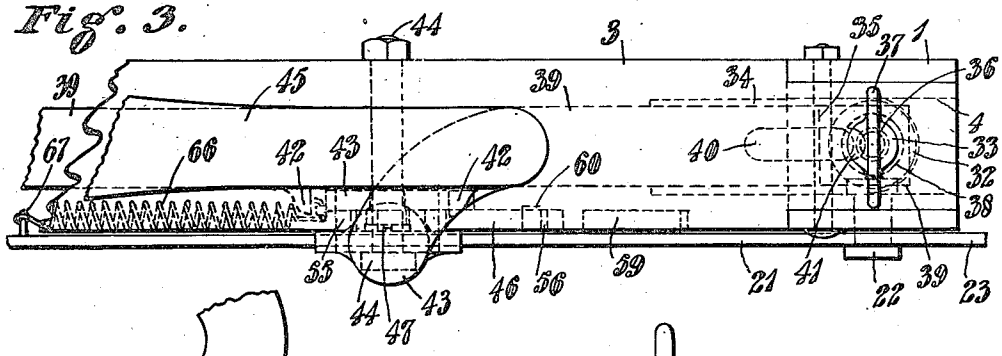
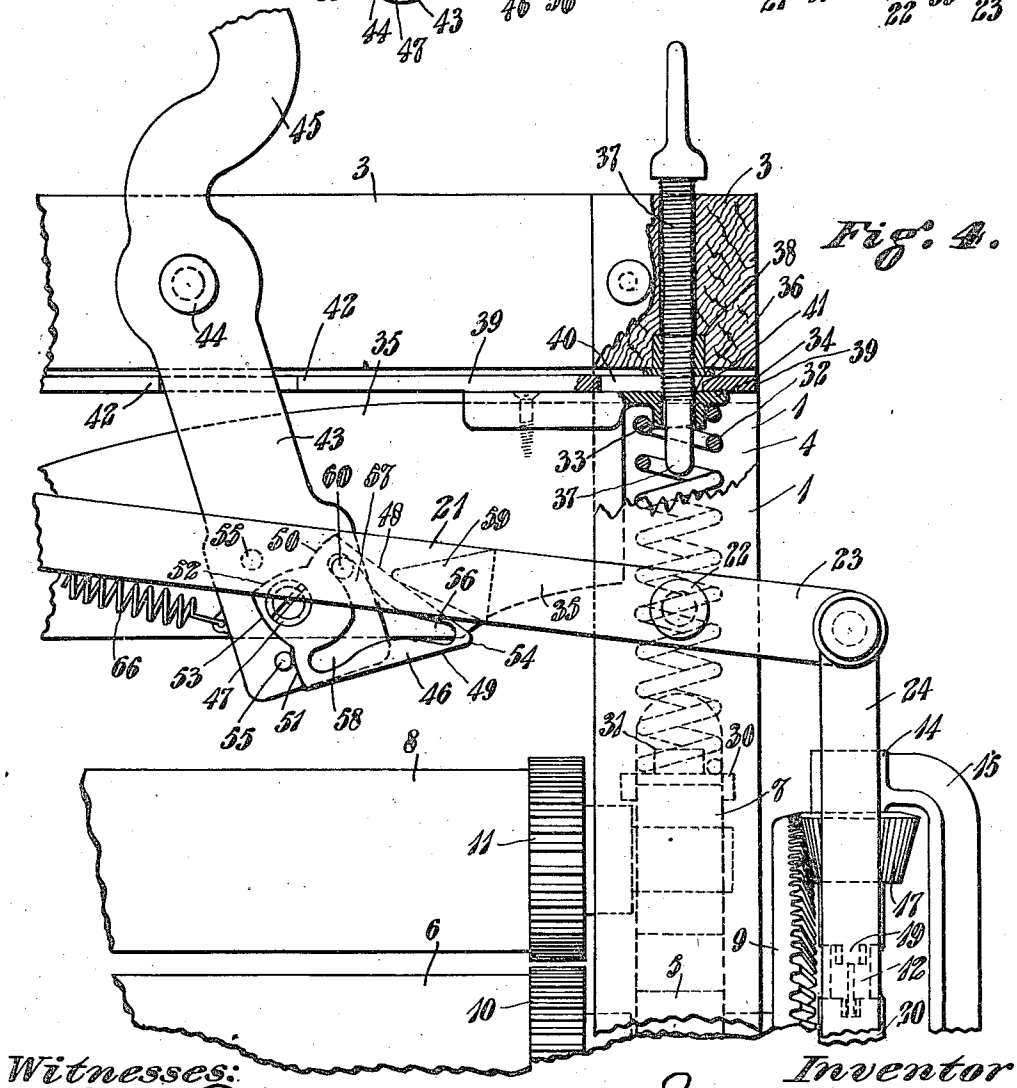


Fig. 4.



Witnesses:

Clarence Perdew

Miles S. Fay

Inventor

James A. Hicks

By James V. Ramsay

Attorney.

UNITED STATES PATENT OFFICE.

JAMES A. HICKS, OF CINCINNATI, OHIO.

WRINGER SAFETY DEVICE.

1,277,073. Specification of Letters Patent. Patented Aug. 27, 1918.

Application filed March 21, 1917. Serial No. 156,412.

To all whom it may concern:

Be it known that I, JAMES A. HICKS, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Wringer Safety Devices, of which the following is a specification.

My invention relates to clothes wringers, and its object is to avoid serious injury to the operator of a power driven clothes-wringer when the operator's hand is accidentally drawn between the wringer rolls.

My invention consists in the combination of parts and in the details of construction and arrangement of parts as will hereinafter be more fully described and claimed.

In the drawing:

Figure 1 is a general perspective view of a wringer equipped with my invention;

Fig. 2 is an enlarged detailed front elevation of the reversing connection of the releasing means;

Fig. 3 is a plan view of the same; and

Fig. 4 is a similar elevation, partly in vertical section, with the parts in their released and reversing positions.

As herein shown, my invention is incorporated in a wringer comprising upright posts 1 at opposite sides, connected together at their bottoms and suitably supported by a bracket 2, and connected together at their tops by a strut 3. These posts 1 have transverse slots 4 from the bottom of the strut 3 for a considerable distance downward, in the bottom of which are fixed lower bearings 5 for the lower wringer roll 6, and in which above the lower bearings 5, are slidably mounted the upper bearings 7 for the upper wringer roll 8. The lower roll 6 turns with a bevel gear 9 outside the posts 1 at the right, and causes the upper roll to rotate in the opposite direction by means of meshing gears 10 and 11 on the lower and upper rolls respectively. The vertical driving shaft 12 has a lower bearing 13 in the bracket 2 and an upper bearing 14 in an upward extension 15 of said bracket 2, and has bevel pinions 16 and 17 loosely mounted on it and meshing with the bevel gear 9 at its bottom and top, respectively. The pinions 16 and 17 have clutch teeth 18 and 19, respectively, extending upward and downward toward each other, and a clutch member 20 is splined on the vertical shaft 12 to cause one or the other pinion to turn with said shaft accordingly as the member 20 is moved downward or upward.

A lever 21 has a fulcrum 22 in the front of the right hand post some distance above the gear and pinions, with a short arm 23 extending out and having a link 24 pivoted to it and extending down and pivoted to a ring 25 loose in an annular groove in the clutch member 20. The lever 21 extends to the left entirely across the wringer and beyond the left hand post, where it has a handle 26. Thus if this handle 26 is depressed, the upper bevel pinion 17 is made to turn with the shaft 12, and if this shaft 12 is driven by any suitable means, such as an electric motor, not shown, the wringer rolls will be rotated to draw objects between them in one direction, while if the handle 26 is raised, the lower pinion 16 will turn with the shaft 12 so that objects will be passed through the wringer in the opposite direction.

The wringer has the usual guide boards 27 and 28 and the reversible drain board 29 below. In fact, all of the details so far described are well known and are described only for the purpose of facilitating the ensuing description of the parts of my invention in their relation to these well known details.

The upper bearings 7 have saddles 30 with upwardly projecting studs 31, fitting down around which are the lower end parts of the strong helical springs 32 which extend up in the slots 4 and receive in their upper end parts downwardly projecting hollow studs 33 on bearing plates 34 which are fixed to the upper sides of opposite end parts of the yoke 35 which extends across the wringer above the rolls with its ends extending into the slots 4 of the posts 1. These parts are also similar to those of well known wringers, except that here the studs 33 are hollow as above noted and holes 36 extend up from their hollow interiors through the bearing plates 34. The usual clamping screws 37 are threaded through nuts 38 fixed in the end parts of the strut 3 at the upper ends of the slots 4 of the posts 1; and in the usual wringer of this design, the lower ends of these screws bear directly on the bearing plates 34. But in my invention these bearing plates 34 have the openings 36 where the screws 37 would bear thereon, and I provide a displaceable bearing bar 39 that extends across the wringer above the yoke 35

and lies across these openings 36 for the lower ends of the screws 37 to bear upon, and thus causes the springs 32 to hold the wringer roll 8 downward with a yielding pressure, as is well known in the construction and operation of this kind of wringers. However, directly to the left of the bearings of the screws 37, the bearing bar 39 has slots 40 extending some distance toward the left and preferably having the ends 41 of their slots next to the respective screws sloping down into the slots from the screws. Thus, if the bearing bar 39 is pushed to the right, sliding between the screws 37 and the respective bearing plates 34, the slots 40 will come in under the screws, receiving the screws readily along the downwardly sloping ends 41 of the slots, so that the lower ends of the screws are merely received into the openings 36 extending down through the studs 33 of the bearing plates 34. Thus the screws 37 can no longer hold the yoke 35 and its bearing plates 34 downward against the springs 32, and thus they will be considerably lengthened and correspondingly weakened so that the upper roll 8 may far more readily yield upwardly.

This bearing bar 39 has, projecting forward, a pair of lugs 42, and a trip-lever 43 has a pivot 44 in the forward side of the strut 3 above the lugs 42, and has a member extending down between the lugs and behind the reversing lever 21. The upper part 45 of the trip-lever 43 above its pivot 44 extends upwardly and to the left over the strut 3, and the parts are so proportioned and relatively positioned that when the bearing bar 39 is in clamping position the part 45 will be some distance up from the strut 3.

The lower end part of the trip-lever 43 behind the reversing lever 21 has a slotted cam 46 mounted on its front side by a pivot 47. This cam, the shape of which may best be seen in the enlarged view in Fig. 2, has substantially straight sides 48 and 49 presented upwardly and downwardly, respectively, to the right, and shorter sides 50 and 51 presented to the left and slightly upwardly and downwardly, respectively, above and below the pivot 47 and joined by curved sides 52 and 53 extending around the pivot 47 and meeting at the left thereof. This cam is thus outwardly roughly in the shape of a triangle with the pivot 47 at the middle of one of its sides and adapted to have its opposite angle or nose 54, formed by the meeting of the sides 48 and 49, swing up and down. To limit this up and down swinging, the trip-lever 43 has stops 55 fixed in its front, respectively immediately above and below the curved sides 52 and 53 for the sides 50 and 51 to engage with. The slot in the cam 46 comprises a short straight part 56 extending from near the nose 54 along a center line through this nose and the pivot 47, and then widening and diverging into upwardly and downwardly inclined parts 57 and 58, respectively.

The reversing lever 21 has, fixed on its rear side, a lug 59 which, as here shown, is triangular with its pointed end toward the nose 54 of the cam 46, and so positioned on the reversing lever that the nose of the cam is a short distance away from the pointed end of the lug when the parts are in normal position. Also, fixed in the reversing lever and projecting rearwardly therefrom inside the slot of the cam, is a pin 60.

A detent plate 61 is fixed on the front side of the post 1 at the left, under the reversing lever 21, with a lower depression 62, an upper depression 63, and a middle depression 64, in which the reversing lever may lie accordingly as the wringer is to be driven in one direction or the other; or, with the reversing lever in midposition in the depression 64, so that the clutch member 20 engages with neither pinion 16 nor 17, the wringer will not be driven at all. To hold the reversing lever in any one of these depressions, a resilient wire 65 extends along in front of the lever close enough to the detent plate 61 to be flexed outward when the lever is pulled out of any detent, or at other times to yieldably hold the lever in the detent where it is placed, with the required firmness.

With the above described construction, should it happen that the operator's fingers are caught between the wringer rolls 6 and 8, the operator may strike forcibly downwardly on the upper part 45 of the trip-lever, which forces the bearing bar 39 to the right and brings the cam 46 under the triangular lug of the reversing lever, if the reversing lever is down; so that by the cooperation of the upper side of the cam 46 with the lower side of the lug 59, or of the lower side of the cam 46 with the upper side of the lug 59, the reversing lever 21 is forced upward or downward, as the case may be, thus reversing the operation of the wringer. The result is that not only is the pressure on the operator's hand, thus caught reduced to such an extent as not to permanently injure the hand, but, by virtue of such light bearing as the rolls still have on the hand, they force it out from between themselves immediately.

The desirability of this combined reversing and releasing will be fully appreciated when it is recognized that the hand and arm increase in thickness from the fingers backward toward the shoulder, so that even where the pressure on the wringer rolls is released and the gears 10 and 11 unmeshed, it may be that the hand or arm has advanced so far between them that in the greater separation they are now permitted to assume, they still bear with considerable

pulling force due to the thicker part of the hand or arm now having come between them; or, even due to the mere frictional contact of the hand or arm with the lower roll 6, which is still running, the hand and arm will continue to be drawn in and crushed in such a manner as to result in a loss or permanent mutilation of the hand or arm.

On the other hand, merely reversing the wringer without relieving the pressure of the rolls would prevent the arm from being drawn farther in, but such part as had passed between the rolls would receive another rolling in being passed outward; so that, if indeed the hand had not been very seriously crushed before the wringer could be reversed, it now would be very seriously crushed by this additional rolling. It will, therefore, be seen that with my combination of releasing and reversing means, both operated by the same trip-lever, which is instantly accessible at the top of the wringer from either side thereof, and which is very readily manipulated simply by striking downward upon it with the open hand, there is a very desirable degree of protection.

As will best be seen in Fig. 2, the tiltable cam 46 is permitted to act merely as a link loosely connecting the lower end part of the trip-lever 43 with the reversing lever 21 during all normal conditions, so that the reversing lever 21 may be raised and lowered without causing any corresponding movement of the trip-lever 43. However, this raising and lowering of the reversing lever 21 always tilts the cam 46 into the right position to project its nose 54 upon the proper side of the lug 59 to move the reversing lever 21 to the opposite position from the one that it happens to be in when the trip-lever 43 is swung over toward the lug 59.

These circumstances are due to the provision of the pin 60 in the reversing lever 21 lying normally in the straight part 56 of the slot of the cam 46. This pin 60, having thus tilted the cam 46 into the proper position relative to the lug 59, further movement of the trip-lever toward the lug 59 causes the cam 46 to travel therewith over the pin 60, and when the straight part 56 no longer contains said pin 60, the nose of the cam 46 will be sufficiently advanced along the proper side of the lug 59 to insure the aforesaid movement of the reversing lever upon continued movement of the trip-lever. During this continued movement, either one or the other of the diverging parts 57 and 58 of the slot receives the pin 60, while the cam 46 itself is tilted back either upwardly or downwardly, as the case may be, against one of the pins 54 or 55. With further tilting thus prevented, the cam 46 is adapted to transmit the required force from the trip-lever 43 to the reversing lever 21. It will of course be understood that this action takes place very quickly as the result of a very forcible blow downward on the upper part 45 of the trip-lever 43, as above described.

In order to pull the trip-lever 43 back to normal position when the parts are being reset after an accident has occurred, I prefer to provide a long and light helical spring 66, having one end connected to the lower part of the trip-lever 43 and the other end connected to a pin 67 in the rear side of the reversing lever, some distance to the left, to yieldably hold the trip-lever out of position for moving the reversing lever. It will be understood that this spring is not of sufficient strength to materially reduce the freedom of operation of the trip-lever; but at the same time materially assists in the resetting operation.

The lower end parts of the screws 37 that are to project through the slots 40 into the openings 36 in the bearing plates are preferably made smooth and with round ends as shown, so that they will very certainly enter these slots and openings.

While I have illustrated my invention as incorporated in a certain type of wringer, it will be understood that it is also applicable to wringers of other types and susceptible to such modifications as may be necessary in adapting it to these or other different requirements, so long as these modifications do not depart from the scope and spirit of the following claims:

1. In combination with a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, releasing means for relieving the pressure of said yieldable means on said rolls, and an operative connection from said releasing means to said reversible means whereby said reversible means is reversed when said pressure is relieved.

2. In combination, a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, and releasing means for relieving the pressure of said yieldable means on said rolls, part of said releasing means being engageable with part of said reversible means whereby said reversible means is reversed when said pressure is relieved.

3. In combination with a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, and releasing means for relieving the pressure of said yieldable means on said rolls, said releasing means being operatively connected to said reversible means whereby said reversible means is reversed when said pressure is relieved.

4. In combination, a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, and releasing means for relieving the pressure of said yieldable means on said rolls, part of said releasing means and part of said reversible means being mutually engageable in either one of two directions, according to the positions of said parts relative to each other, whereby said reversible means is reversed in either direction when said pressure is relieved.

5. In combination with a pair of coöperating rolls, yieldable means pressing on said rolls to hold them together, a reactive element for said yieldable means, a displaceable bearing member between said yieldable means and its reactive element, reversible means for driving said rolls in either direction, and an operative connection from said displaceable bearing member to said reversible means whereby said means is reversed when said member is displaced.

6. In combination with a pair of coöperating rolls, yieldable means pressing said rolls to hold them together, a reactive element for said yieldable means, a displaceable bearing member between said yieldable means and its reactive element, reversible means for driving said rolls in either direction, a reversing lever to reverse said reversible means, a trip-lever to displace said bearing member, a tiltable cam pivoted on one of said levers, means on the other lever engaging with said cam whereby said cam is tilted when said reversing lever is moved, without moving said trip-lever, and means on said other lever with which said cam engages on one side or the other, according to the position it is tilted into, to move said reversing lever in one direction or the other, according to the side of said means said cam engages on, when said trip lever is moved to displace said bearing member.

7. In combination with a pair of coöperating rolls, yieldable means pressing said rolls to hold them together, a reactive element for said yieldable means, a displaceable bearing member normally between said yieldable means and its reactive element, an operating element having operative relation with said displaceable bearing member to displace said member from its normal position or move said member into its normal position, and holding means for said operating element adapted to prevent said displacement of said bearing member under jar and strain imposed thereon from said rolls.

8. In combination with a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, releasing means for relieving the pressure of said yieldable means on said rolls, a reversing lever to reverse said reversible means, a trip-lever to engage and operate said releasing means, and means to yieldably hold said trip-lever out of operative engagement with said reversing lever.

9. In combination with a pair of coöperating rolls, a helical spring pressing said rolls to hold them together, an adjusting screw for said spring, a bearing plate between said spring and said screw, having an opening in alinement with said screw, a bearing bar having an opening and normally lying between said bearing plate and screw with its opening out of alinement with said screw and said opening in said bearing plate, and adapted to be displaced to bring its opening in said alinement, reversible means for driving said rolls in either direction, and an operative connection from said bearing bar to said reversible means whereby said means is reversed when said bar is displaced.

10. In combination with a pair of coöperating rolls and yieldable means pressing said rolls to hold them together, reversible means for driving said rolls in either direction, releasing means for relieving the pressure of said yieldable means on said rolls, a reversing lever to reverse said reversible means, a trip lever to operate said releasing means, a tiltable cam having opposite bearing faces and pivoted on said trip lever, means on said reversing lever engaging with said cam whereby said cam is tilted when said reversing lever is moved, without moving said trip lever, and means on said reversing lever with which said cam engages on one side or the other, according to the position it is tilted into, to move said reversing lever in one direction or the other according to the side of said means said cam engages on, when said trip lever is moved to operate said releasing means.

11. In combination with two levers, a tiltable cam having opposite bearing faces and pivoted on one of said levers, means on the other lever engaging with said cam whereby it is tilted when this other lever is moved, and means on this other lever which engages one or the other bearing face of said cam, according to the position said cam is tilted into, whereby only one of said levers is adapted to have operative movement without imparting operative movement to the other one of said levers.

12. In combination with two levers, only one of which has operative movement independently of the other, a cam having a pivot on one of said levers and having a nose and sides diverging from said nose toward opposite sides of said pivot, and having a slot opening toward the other of said levers comprising a main part beginning near said nose and extending toward said pivot, and parts

diverging from said main part toward opposite sides of said pivot, a pin in the other of said levers normally extending into said main part of said slot to tilt said cam when one of said levers is moved one way or the other, without moving the other lever, and a lug on said other lever substantially midway of the range of tilting of said nose, to one side or the other of which said nose passes and which thus engages with one or the other of said diverging sides, according to the direction in which said cam has been tilted, when the other of said levers is moved, while said pin passes into one or the other diverging part of said slot, whereby said other lever is moved in one direction or the other according to the side of said cam engaged.

13. In combination with two levers, only one of which has operative movement independently of the other, a cam having a pivot on one of said levers and having a nose and sides diverging from said nose toward opposite sides of said pivot, and having a slot opening toward the other of said levers comprising a main part beginning near said nose and extending toward said pivot, and parts diverging from said main part toward opposite sides of said pivot, said cam also having sides at opposite sides of said pivot presented away from said nose, stops on said lever on which said cam has said pivot, at opposite sides of said pivot and spaced away from said pivot in the direction away from said nose to allow said cam to tilt on said pivot and move its nose one way or the other, but to limit said tilting, a pin in the other of said levers normally extending into said main part of said slot to tilt said cam when one of said levers is moved one way or the other, without moving the other lever, and a lug on said other lever substantially midway of the range of tilting of said nose, to one side or the other of which said nose passes and which thus engages with one or the other of said diverging sides, according to the direction in which said cam has been tilted, when the other of said levers is moved, while said pin passes into one or the other diverging part of said slot, whereby said other lever is moved in one direction or the other according to the side of said cam engaged.

14. In combination with a pair of coöperating rolls, yieldable means pressing said rolls to hold them together, a reactive element for said yieldable means, a displaceable bearing member normally between said yieldable means and its reactive element, reversible means for driving said rolls in either direction, a trip lever to hold said bearing member in normal position or displace it, a reversing lever to reverse said reversible means, and means on said reversing lever with which said trip lever will engage when employed to displace said member, and thereby make displacement of said member also effect a movement of said reversing lever.

JAMES A. HICKS.

Witnesses:
JAMES N. RAMSEY,
CLARENCE PERDEW.