J. N. SELVIG AND R. JONGEDYK.

SAFETY ATTACHMENT AND LOCKING DEVICE FOR MACHINES.

APPLICATION FILED JULY 10, 1920.

1,412,974. **Patented Apr. 18, 1922.**

2 SHEETS—SHEET 1.

Fig. 4.

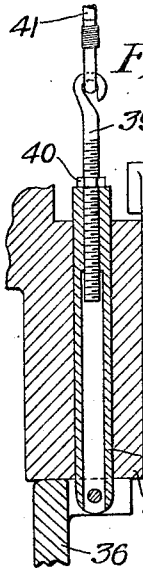
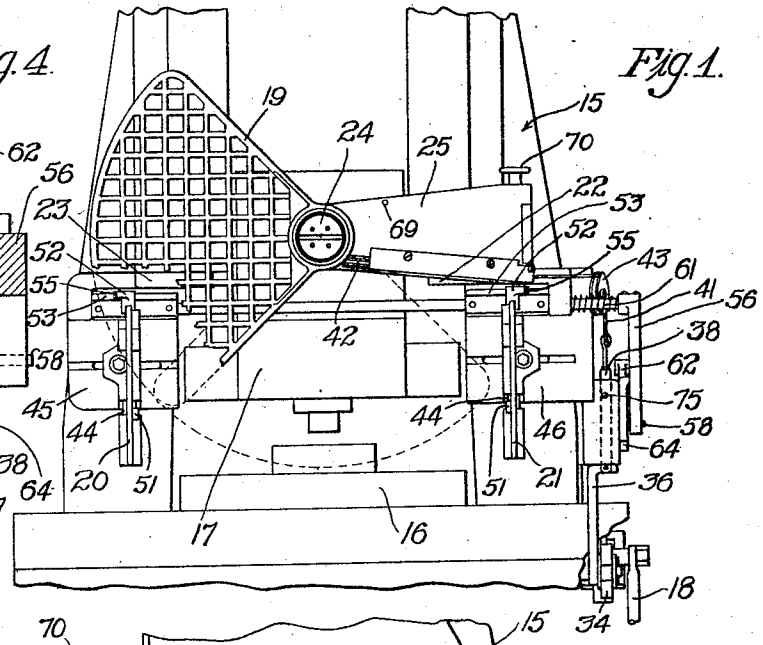


Fig. 1.



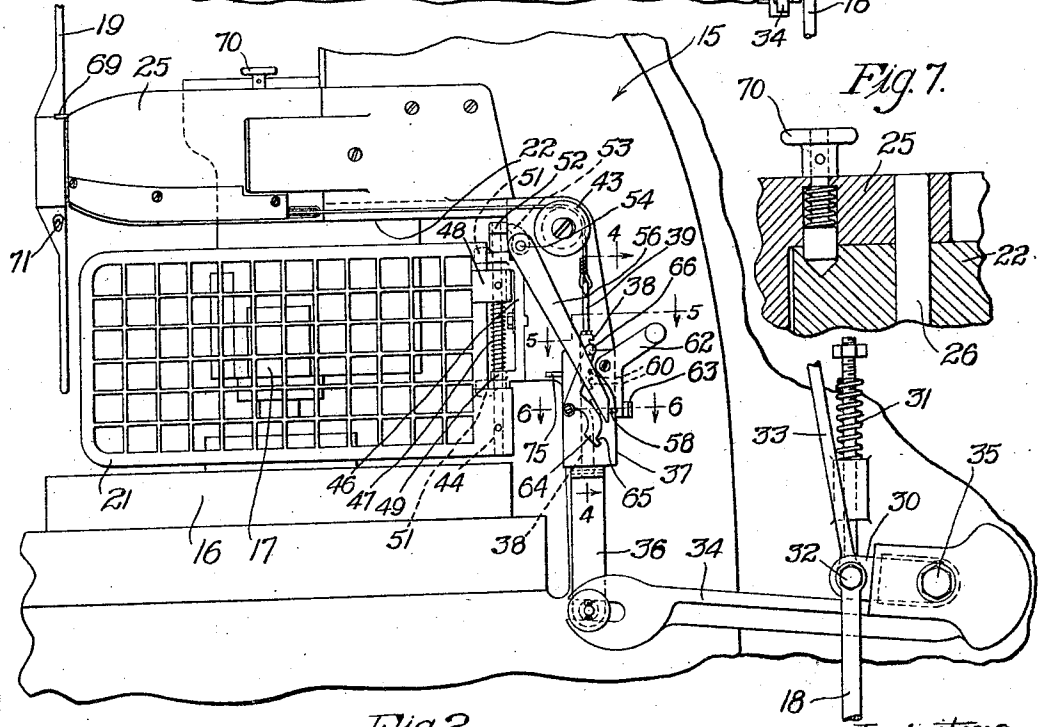


Fig. 2.

Fig. 7.

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2 SHEETS—SHEET 2.

Fig. 5.

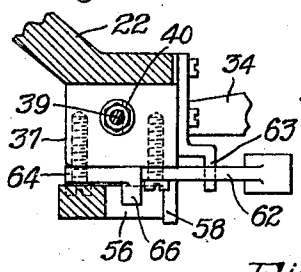


Fig. 6.

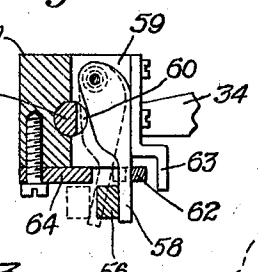


Fig. 3.

Fig. 9.

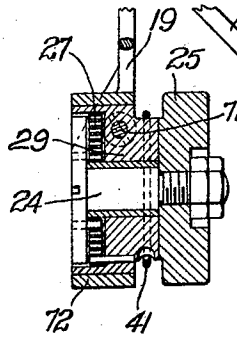
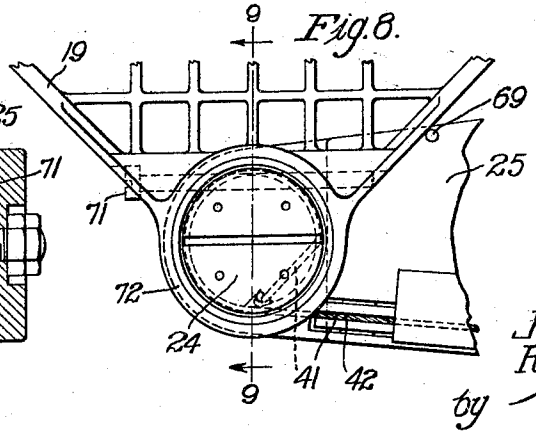


Fig. 8.



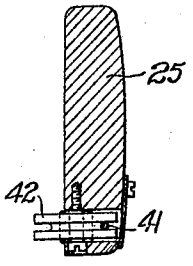


Fig. 10.

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UNITED STATES PATENT OFFICE.

JOHN N. SELVIG AND RALPH JONGEDYK, OF CHICAGO, ILLINOIS, ASSIGNORS TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SAFETY ATTACHMENT AND LOCKING DEVICE FOR MACHINES.

1,412,974. Specification of Letters Patent. **Patented Apr. 18, 1922.**

Application filed July 10, 1920. Serial No. 395,363.

To all whom it may concern:

Be it known that we, JOHN N. SELVIG and RALPH JONGEDYK, a subject of the King of Norway and a citizen of the United States, respectively, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Safety Attachments and Locking Devices for Machines, of which the following is a full, clear, concise, and exact description.

This invention relates to safety attachments and locking devices for machines such as power punch presses having co-acting parts relatively movable to and from each other to press, stamp, or otherwise operate upon work inserted between the co-acting parts of the press.

The principal object of this invention is to provide a control for safety guards which insures positiveness and precision of operation with relation to the operation of the press.

Among the other objects of this invention are the provisions for preventing the operation of the press when any of the guards are displaced out of normal position and the features of construction and combination of the several parts for rendering them easily accessible for change or adjustment without disturbing the adjustment of the parts.

In the drawings—

Fig. 1 is a partial front elevation of the safety guard and its operating mechanism shown in its normal position mounted on a punch press of well known type. The broken line position of the center guard indicates its position after the treadle has been depressed its full movement;

Fig. 2 is a slightly enlarged side elevation thereof;

Fig. 3 is a plan view thereof with the press shown in broken line outline;

Fig. 4 is an enlarged vertical section taken on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged plan section taken on the line 5—5 of Fig. 2;

Fig. 6 is an enlarged plan section taken on the line 6—6 of Fig. 2;

Fig. 7 is an enlarged detail view of the means provided for locking the hinged section of the center guard support in its normal position;

Fig. 8 is an enlarged partial front elevation of the center guard and its support with the guard shown in a position which allows access to work and die for alining purposes;

Fig. 9 is a vertical sectional view taken on the line 9—9 thereof, and

Fig. 10 is a vertical sectional view taken on the line 10—10 of Fig. 3.

In the drawings 15 represents a punch press of well-known construction and operation with only such portions indicated which are necessary to show the mounting of the guard and the operation thereof. Stationary and reciprocal co-acting press members are indicated at 16 and 17, and 18 is a treadle rod which at its lower end is connected to a foot treadle, not shown, which controls a suitable clutch mechanism and through it the operation of the press.

The guard is composed of three members, a front segmental shaped guard 19 and two rectangular shaped side guards 20 and 21. In the operation of the press the guard 19 is rotated downward from the horizontal position, as shown, to the vertical position indicated by broken lines in Fig. 1. In its normal position the guard 19 gives access to the members 16 and 17 for the placing and alining of work therebetween, while in its vertical position access thereto is prevented. The side guards 20 and 21 are normally held by spring pressure in a fixed position, but should the operator displace either one by attempting to aline the work after depressing the foot treadle, or if one or the other should be displaced during the alining of the work and the treadle accidentally depressed, the movement of the rod 18 will be arrested, thereby preventing the tripping of the clutch which controls the movement of the reciprocating member 17. If an operator should have his hand between the members 16 and 17 and the treadle is depressed, the guard 19 in its movement downward will wedge his hand between the lower edge of the guard and the plate on the bed of the press which will prevent the full movement of the treadle or remove his hand or warn him in time to remove it; or it will force his hand over against either one of the side guards, thereby displacing it and preventing the tripping

of the clutch. The means for arresting the movement of the rod 18 under the above conditions will be described later.

The guards 19 and 21 are supported from the press by a bracket 22, while the guard 20 is supported by a separate bracket 23. The brackets 22 and 23 are suitably secured to ledges formed in the guides or ways of the press. The guard 19 is pivoted at 24 to a curved arm 25 hinged to the bracket 22 at 26 and is returned to its normal position after an operation of the press by a spiral spring 27 suitably positioned in a depression in a housing 29 pivoted to the arm 25 which directly carries the guard 19. The spring 27 also functions to return the rod 18 and the foot treadle to their normal position after an operation of the press, except when being used for strip punching, at which time a spring 31 is used to return the rod 18 and the foot treadle to their normal position. Otherwise the spring 31 is allowed to relax by turning a nut on the rod 18 upwards. The upper end of the rod 18 is pivoted to a forked arm 30 through a pin 32 which projects outside of the forked end of the arm 30. Pivoted between the forks of the arm 30 on the pin 32 is a trip rod 33 which extends upward to the clutch which is operated whenever the treadle is depressed its full movement. The forked arm 30 is pivoted along with a bell-crank lever 34 into which one end of the arm 30 enters at 35 to the frame of the press. In moving down in response to the movement downward of the rod 18 the arm 30 turns the bell-crank lever 34 in the same direction. The bell-crank lever 34 is provided with a counter weight which helps to return the treadle and connections to their normal position after an operation of the press. Pivoted to the opposite end of the lever 34 is an L-shaped member 36 which in its normal position rests against a downwardly projecting portion 37 of the bracket 22. Upon the opposite end of the member 36 and riding in an opening in the downwardly projecting portion 37 of the bracket 22 is pivoted a rack 38 which has screw threaded into its upper end an adjustable screw threaded pin 39. A lock nut 40 secures the pin 39 in place after an adjustment.

Suitably secured to the guard 19 about its pivot, as clearly shown in Figs. 8 and 9, is a flexible bronze cord 41 which after making one turn about the hub portion of the guard 19 in a counter clock-wise direction is guided to the adjustable pin 39 with a shackle formed in its end which is passed under a hooked end of the pin 39. A chain or any suitable flexible means could be used for the same purpose and be easily substituted for the bronze cord 41. As clearly shown in Fig. 3, the cord 41 is guided from the guard 19 to the pin 39 by rollers 42, 42 having suitable bearings in the arm 25 and the grooved wheel 43 carried by the bracket 22. By turning the pin 39 up or down in the rack 38 the cord 41 is let out or taken up thereby adjusting the normal position of the guard 19.

As clearly shown in Figs. 1, 2, and 3, the guards 20 and 21 are hinged by pins 44 to brackets 45 and 46 which are adjustably mounted for lateral movement on the main brackets 23 and 22 through slots cut therein. Coiled springs 47, located around the pins 44 and between lugs 48 and 49 secured to the guards 20 and 21 and the brackets 45 and 46 respectively with the ends of the coils thereof secured in openings therein, keep the guards in their normal position against stops 51, 51 on the brackets 45 and 46. The pins 44 are suitably secured to the guards 20 and 21 so that they turn therewith. Attached to the upper end of the pins 44 are cams 52 which are always in engagement with cams 53 attached to a laterally extending rod 54. Surfaces 55 on the cams 52 are beveled (see Figs. 1 and 3) for the purpose of keeping the guards 20 and 21 in their open position when it is desired to do so. Secured to one end of the rod 54 is an arm 56 which engages at its lower end a stop 58 which is suitably pivoted in a slot 59 cut in the downwardly projecting portion 37 of the bracket 22 (see Fig. 6). The stop 58 enters one of several notches 60, 60 in the rack 38 whenever either of the guards 20 and 21 are displaced about their pivots in an outward direction from their normal position, due to the cam 52 acting against the cam 53, the movement of which causes the arm 56 to be swung forward with the stop 58 following, due to a weighted lever 62 which bears against the stop 58. The engaging edge of the stop 58 is beveled to form the same shape as the notches 60, 60 in the rack 38 so that the least movement of the arm 56 caused by the displacement from normal position of either side guard will cause the stop to engage a notch in the rack. The teeth of the rack and the stop are suitably hardened so as to prevent stripping when engaged during a depression of the treadle or when under tension. A coiled spring 61 mounted around the rod 54 with one end carried in an opening in the bracket 22 and the other end in an opening in the arm 56 keeps the arm in its normal position. A stop 63 supported from the bracket 22 is provided to prevent the turning of the lever 62 about its pivot to such a position where it would not act to move the stop 58 forward when the arm 56 is swung forward. Also a weighted latch 64 pivoted to the bracket 22 is provided for keeping the stop 58 in its normal position irrespective of any movement of the guards 20 and 21 from their normal position whenever it is desired to do so. A shoulder 65

on the latch 64 engages under the end of the stop 58 when the latch 64 is turned in counter-clockwise direction and a weighted end 66 on the other end of the latch retains the shoulder 65 in engagement with the stop 58 after the latch has passed to the other side of the pivot thereof. When the press is being used for strip punching the side guards 20 and 21 are opened with the beveled surfaces 55 of the cams 52 holding them in that position and the latch 64 holding the stop 58 from engaging the rack. At the same time the arm 56 has been moved forward due to the cam 52 riding against the cam 54. In closing the guards 20 and 21 after strip punching the cams 53 follow the cams 52, thereby allowing the arm 56 to move back under the action of the spring 61. In moving back, the arm 56 releases the latch 64 from the stop 58 due to the engagement of the weighted end 66 with the latch 64. When alining or changing the die the guard 19 may be turned upward about its pivot 24 and allowed to rest against a pin 69 after unhooking the cord 41 from the pin 39 (see Fig. 8).

The guard 19 and its supporting arm 25 may be swung to one side whenever it is necessary by unhooking the cord 41 from the pin 39 and then drawing a spring-pressed pin 70 carried in the arm 25 from the bracket 22. The guard and its supporting arm may then be turned about the hinge 26 to the broken line position indicated on Fig. 3, or to any intermediate position.

Whenever it is necessary to repair or replace the guard 19 with another guard having a larger or smaller segmental area, a screw 71 (indicated clearly in Figs. 8 and 9) is withdrawn, which allows the guard with its central sleeve portion 72 to be removed from the housing 30 carried on the pivot 24.

When the press is being used for strip punching it is desirable that the guard 19 be held in a vertical position as shown in broken lines on Fig. 1. This is accomplished by unhooking the shackled end of the cord 41 from the hooked end of the pin 39 and hooking it over a pin 75 suitably positioned in the bracket 22.

What is claimed is:

1. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, a support including an arm pivoted thereto but normally held in a fixed position and extending substantially midway across the front of the press, a safety guard pivoted on said arm, releasing means associated with said arm to permit the quick removal of said arm from its normal position to a position which allows free access to the die for alining and changing purposes, and means for rotating said guard controlled by the movement of the treadle rod.

2. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, a support, a safety guard pivoted thereto by a rotatable sleeve, a link and lever mechanism controlled by the movement of the treadle rod, means for rotating said guard comprising a flexible connection secured at one end to said rotatable sleeve and at its other end to said link and lever mechanism, and guiding means for said flexible connection between said sleeve and said link and lever mechanism.

3. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, a support, a safety guard pivoted thereto by a rotatable sleeve, a link and lever mechanism controlled by the movement of the treadle rod, means for rotating said guard comprising a flexible connection secured at one end to said rotatable sleeve and at its other end to said link and lever mechanism, spring means located within said sleeve adapted to return said guard and treadle rod to their normal position, and guiding means for said flexible connection between said sleeve and said link and lever mechanism.

4. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, a safety guard at the front of the press, guards normally held in a fixed position mounted at the sides of the press but adapted to move in a horizontal direction, a support for one of said guards including an arm pivoted thereto and normally held in a fixed position and to which said front guard is pivoted, a second support for said other guard, and means for rotating said front guard controlled by the movement of the treadle rod.

5. A safety attachment and locking mechanism for power presses, comprising in combination with the frame of the press, a safety guard at the front of the press, guards mounted at the sides of the press, a main support for each of said guards each including a second support which pivotally supports one of said guards and is adapted to be laterally adjusted on said main support and also quickly removed therefrom, one of said main supports including an arm pivoted thereto and normally held in a fixed position and to which said front guard is pivoted, and means for rotating said front guard controlled by the movement of the treadle rod.

6. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, a safety guard at the front of the press, guards pivotally mounted at the sides of the press, supports for said guard, a trip rod, means located between said trip rod and said

guards adapted to lock the trip rod whenever said guards are displaced from their normal position thereby preventing the operation of the press, means for holding said guards in their normal position, and means for rotating said front guard controlled by the movement of the treadle rod.

7. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, guards pivotally mounted at the sides of the press, supports for said guards, a trip rod, means located between said trip rod and said guards adapted to lock the trip rod whenever said guards are displaced from their normal position thereby preventing the operation of the press, and means for holding said guards in their normal position.

8. A safety attachment and locking device for power presses, comprising in combination with the frame of the press, guards pivotally mounted at the sides of the press, supports for said guards, a trip rod, means located between said trip rod and said guards adapted to lock the trip rod whenever said guards are displaced from their normal position, means for holding said guards in their normal position, and means for causing said locking means to be inoperative when the press is being used for strip punching.

In witness whereof, we hereunto subscribe our names this 18th day of June A. D., 1920.

JOHN N. SELVIG.
RALPH JONGEDYK.