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SAFETY GUARD ATTACHMENT FOR PUNCHING PRESSES.

APPLICATION FILED JUNE 30, 1914.

1,196,764.

Patented Sept. 5, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

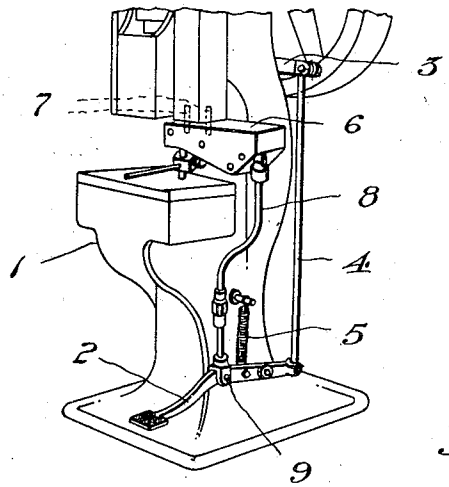


Fig. 2.

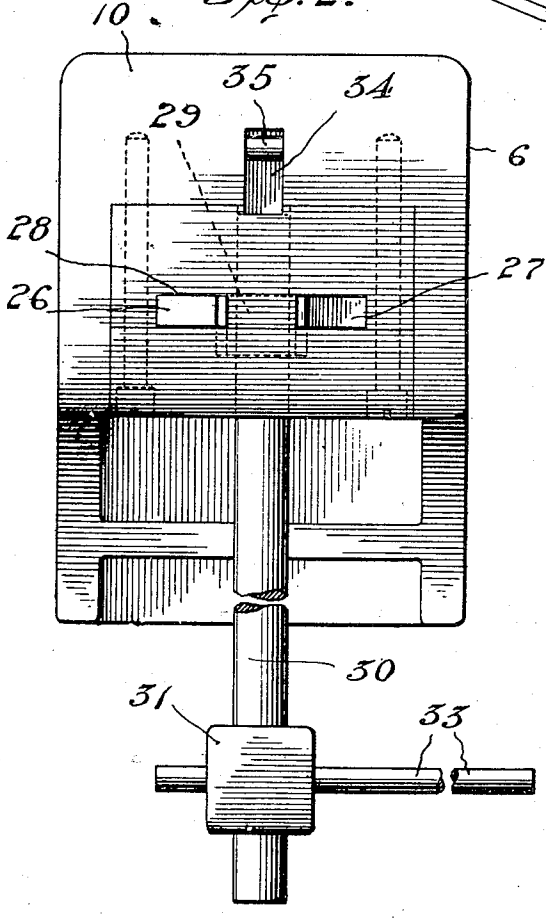
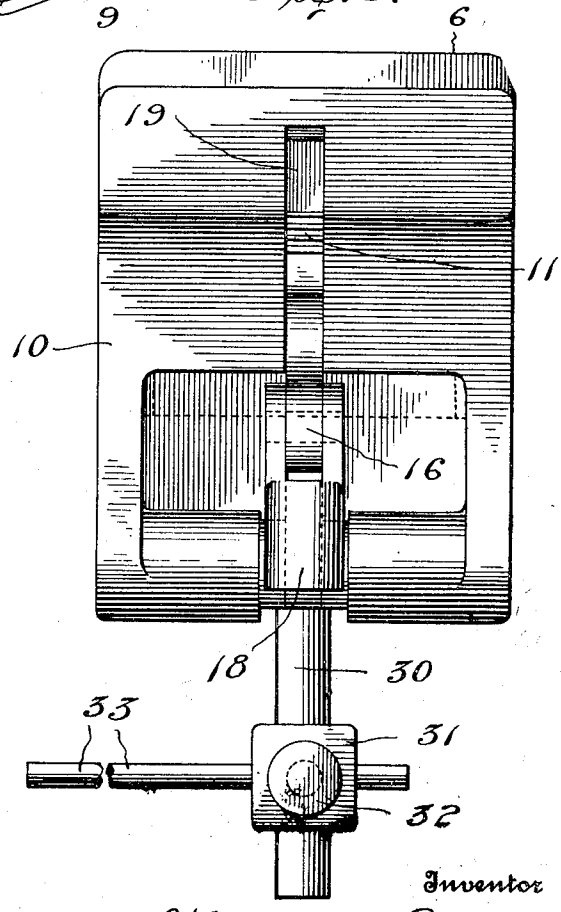


Fig. 3.



Witnesses

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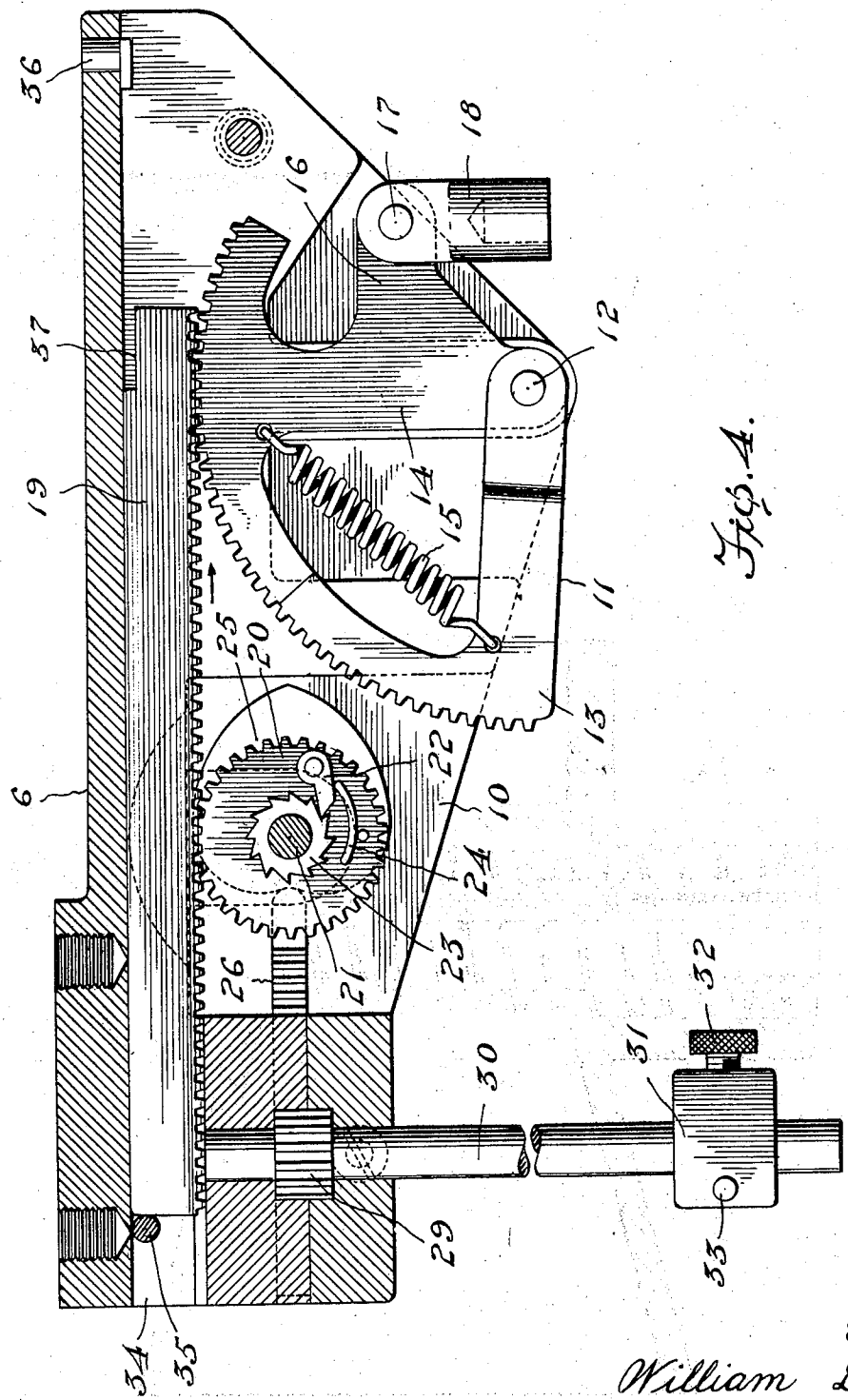


Fig. 4.

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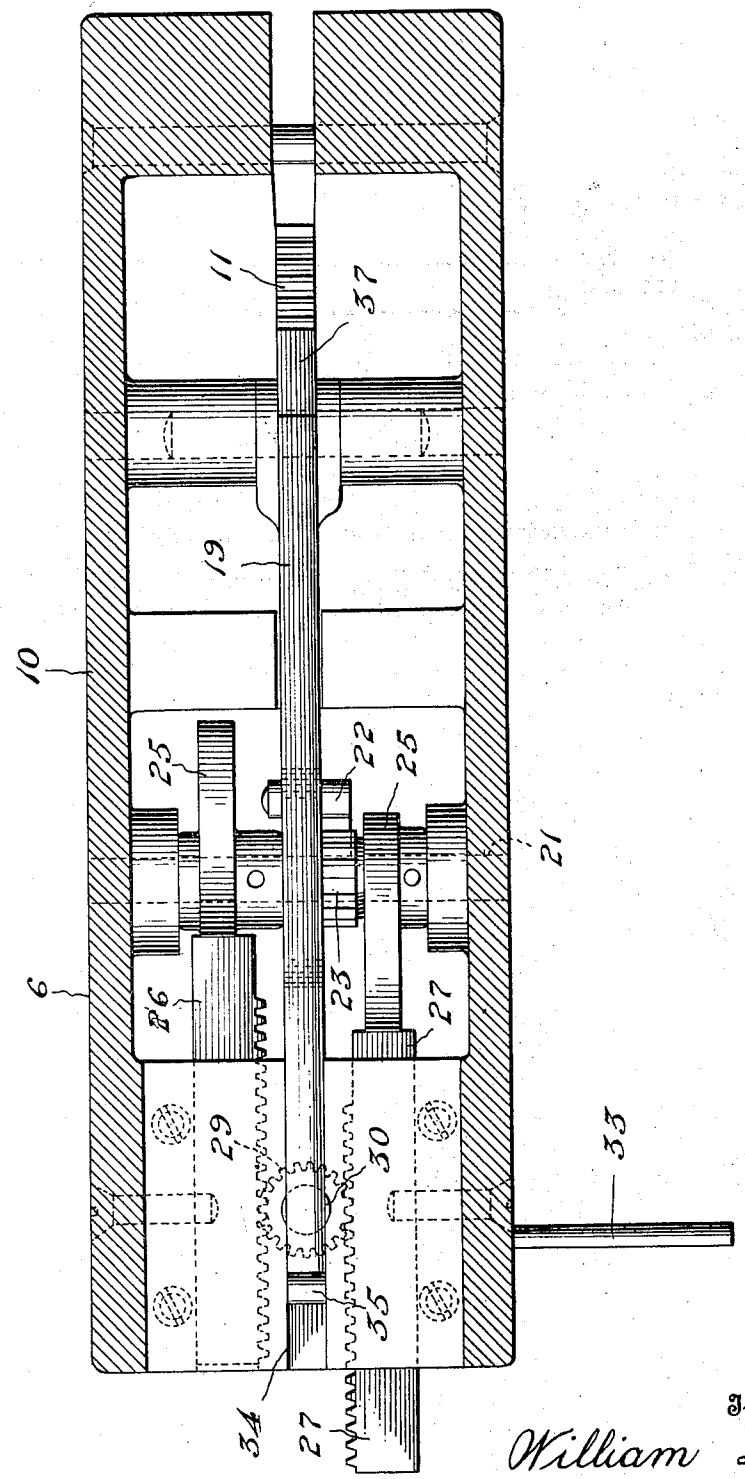
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3 SHEETS—SHEET 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

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SAFETY-GUARD ATTACHMENT FOR PUNCHING-PRESSES.

1,196,764. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed June 30, 1914. Serial No. 848,271.

To all whom it may concern:

Be it known that I, WILLIAM DICKS, citizen of the United States, residing at Kenmore, in the county of Erie and State of New York, have invented certain new and useful Improvements in Safety-Guard Attachments for Punching-Presses, of which the following is a specification.

This invention relates to an improved safety guard attachment for punching presses and like machines, the device being calculated to protect the hand of the operator from injury while operating the machine.

The invention consists essentially of a guard or safety rod caused to move back and forth horizontally between the dies of a power press or machine, the movement of the said rod being so timed as to be actuated slightly in advance of a punching operation.

In describing my invention in detail reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a perspective view of a portion of a power punching press, the attachment being shown arranged thereupon; Fig. 2 is an end view of the attachment; Fig. 3 is a similar view looking at the opposite end from that of Fig. 2; Fig. 4 is a longitudinal sectional view; and Fig. 5 is a similar view, the section being taken transversely to the section shown in Fig. 4.

Before proceeding with the description of the drawings, I desire to call particular attention to the fact that while I have evolved my invention with reference to its application in connection with a power punching press, the same may be readily utilized as a safety attachment or guard device in connection with stamping machines, printing presses and various other devices or machines wherein the parts are movable toward and away from each other as shown.

Referring now to the drawings by numerals, 1 designates, as an entirety, a power punching press, the said press having associated therewith the usual fulcrumed treadle 2, operating lever 3, connecting rod 4, and return spring 5; movement of the treadle 2 controlling the operation of the press.

The attachment, designated as an entirety by the numeral 6 is fastened to the press 1, as shown, through the medium of screws or like fastening devices designated 7, the said attachment or safety device being actuatable through movement of the treadle 2, a suitable connecting rod 8 attached as at 9 to the treadle causing the said attachment to be actuated simultaneously with the operation of the press and slightly in advance of the engagement between the movable and stationary dies. Said attachment 6 in its preferred embodiment consists of a suitable frame or casing 10, between the sides of which a segment 11 is pivoted or mounted for oscillation as indicated at 12. Segment 11 is preferably made sectional, the sections being designated respectively 13 and 14, said sections being normally in engagement as shown in Fig. 4 and connected or held in such engagement by means of a helical spring 15. An arm or extension 16 is integral with segment section 14, the said arm having pivoted thereto as at 17 a casting 18 to which connecting or operating rod 8 is secured. The teeth of segment 11 mesh with the teeth of an operating rack 19, the teeth of the said rack being also engageable with the teeth of a gear 20 mounted upon a shaft 21 journaled in the sides of the casing or frame. Gear 20 is loose upon the shaft and carries a pivoted pawl 22, the said pawl being engageable with a ratchet 23 rigid with the shaft to impart thereto rotary movement upon actuation of the gear 20 as will hereinafter appear. Pawl 22 is normally held in engagement with the rack by a spring or the like 24.

Mounted upon shaft 21 and rotatable therewith, one upon each side of the gear 20, are cams or eccentrics 25, one of the said cams or eccentrics being engageable with a rack bar 26 and the other of the said cams or eccentrics being engageable with a similar rack bar 27, the two rack bars operating within openings 28 therefor of the frame or casing and engaging at diametrically opposite points a pinion 29, said pinion being keyed or otherwise fixedly secured to a spindle 30 journaled in the frame or casing and operating in a substantially vertical plane. Spindle 30 has fastened thereto at a point adjacent its lower end a bracket 31 in the nature of a sleeve or collar, the said bracket being adjustable longitudinally of the spindle through manipulation of a thumb screw 32. The said bracket 31 carries a safety or guard rod 33, the latter extend-

ing transversely of the spindle 30 to operate in a substantially horizontal plane, between the dies of the press 1 as shown to advantage in Fig. 1.

Rack 19 operates in a guide way 34 of the casing, a stop element 35 extending across the guide way serving as a means whereby movement of the rack 19 is limited in one direction, while a second stop device or element 36 (adjustable, if desired) is adapted for engagement with the opposite end of the said rack to limit movement thereof in the opposite direction, the rack being preferably cut away as indicated at 37 to conform to the configuration of the element shown at 36.

Operation of the device is as follows: When treadle 2 of the press is actuated, movement is imparted to operating or connecting rod 8. The pull exerted upon the said rod 8 by the pressure upon treadle 2 will cause segment 11 to be turned, the said segment by reason of its engagement with the rack 19, causing the latter to be actuated or moved longitudinally relatively to the frame. Should the length of the stroke of treadle 2 be greater in length than the stroke desired to be imparted to rack 19, section 14 of segment 11, as the said section moves out of mesh with the teeth of rack 19, will be permitted to continue movement against tension of spring 17, the stop element 36 holding the said rack in place, this arrangement, as is apparent upon reference to the drawings allowing rack bar 19 to be actuated without in any way affecting or changing the length of stroke of the treadle 2. Spring 15, when treadle is released, will return segment section 14 into its normal position in engagement with segment section 13 as shown. Movement of rack bar 19 in the direction indicated by the arrow in Fig. 4 will cause gear 20 to be turned, and ratchet 23, by reason of the engagement of the pawl 22 therewith, to impart movement to shaft 21. Cams or eccentrics 25 being actuatable through movement of the shaft, it is apparent that the rack bars 26 and 27 will be actuated, the formation of the cam devices causing rack bars 26 and 27 to at all times move in opposite directions. Both of the rack bars being engageable with pinion 29 of spindle 30, it is further apparent that the latter will be turned causing guard or safety rod 33 to be moved horizontally across the operating surface of the press and between the coacting dies forming a part thereof. Movement of rack bars 26 and 27 is such in its nature as to cause guard or safety rod 33 to be given a half turn causing the said rod to move in the path of a circle a distance of about 180°. Mounting gear 20 loose upon shaft 21, and mounting pawl 22 upon the gear, it is apparent that motion is imparted to the said shaft 21 only upon movement of rack 19, in one direction, the said rack 19 when moving in a direction opposite to that indicated by the arrow in the said Fig. 4 causing gear 20 to turn idle upon the shaft 21 without in any way affecting the operation of the cam or eccentric devices 25. The above operation will cause guard or safety rod 33 to be actuated but once, such actuation being slightly in advance of the engagement between the coacting dies of the press.

From the foregoing, taken in connection with the accompanying drawings it will be noted that by the provision of the sectional segment 11, the operating stroke of treadle 2 need in no way be affected by the adjustment of the length of stroke of rack bar 19; that the eccentric devices 25 will cause rack bars 26 and 27 to at all times move in opposite directions; and that guard or safety rod 33 may be adjusted vertically relatively to spindle 30 to in this manner cause the said rod to operate in a horizontal plane directly above the stationary die of the press or machine in connection with which the attachment is used.

In reduction to practice, I have found that the form of my invention, illustrated in the drawings and referred to in the above description, as the preferred embodiment, is the most efficient and practical; yet realizing that the conditions concurrent with the adoption of my device will necessarily vary, I desire to emphasize the fact that various minor changes in details of construction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of my invention, as defined in the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a press attachment, the combination with control means for the press, of a guard member, means connected to said control means for moving said guard in a substantially horizontal plane between the dies of the press, and means operating automatically to permit said guard member to intermittently remain inactive.

2. In a press attachment, the combination with control means for the press, of a guard member, mechanism operable to move said guard, and a yielding connection between the control means and said mechanism for the purpose specified.

3. In a press attachment, a guard member, mechanism including a reciprocable rack bar operable to move said guard, a stop engaging with said bar to limit its movement, means to move the bar, and means operating to permit the guard member to remain inactive at intervals during movement.

4. A press attachment including a safety

element, a reciprocable rack bar, means including a segment engageable with the said rack bar, said segment being actuatable through operation of the control means of the press, cam devices actuatable upon movement of the rack bar in one direction to actuate the said element, and means operating automatically upon a reverse movement of the rack bar to permit the cam devices to remain inactive.

5. A press attachment including a safety element, cam devices actuatable to move said element, means operating automatically to permit said cam devices to intermittently remain inactive, and a connection between the control means for the press and said cam devices.

6. A press attachment including a safety element, reciprocable rack bars operable to actuate the said element, a cam device engageable with each of the respective rack bars to control movement thereof, means actuatable through movement of the control means of the press to render said cam devices operative, and means operating to permit said cam devices to remain inactive.

7. A press attachment including a safety element, means operable upon actuation of the control means of the press to render said element operable, means controlling said operating means, and a divided segment directly actuatable upon operation of the control means of the press, the sections of the said segment being separable to render said control means operative without affecting said operating means.

8. In a press attachment, an intermittently movable guard member, opposed simultaneously movable rack bars directly engaging said guard member, a reciprocable bar, cam devices operable through movement of said bar, and means to reciprocate said bar.

9. In a press attachment, a movable guard member, a support therefor, oppositely and simultaneously reciprocable rack bars directly engaging said support to move said guard, cam devices operable to reciprocate said bars, and means operating to permit said bars to intermittently remain inactive.

10. In a press attachment, a movable guard member, a control means, and a connection between said control means and said guard member comprising a divided segment, one of the segment sections being yieldingly movable relatively to the other during operation of the control means, substantially as described.

11. In a press attachment, a movable guard, means to move said guard at intervals, a divided segment engaging said last mentioned means, a spring connection between the respective segment sections, means to move the segment, means to limit movement of one of the sections, the spring aforesaid yielding during relative movement of said sections, as and for the purpose set forth.

12. In an attachment for presses, a guard member, a reciprocable rack bar, means operable through movement of the bar to move said guard, said last mentioned means operating at intervals to permit the guard to intermittently remain inactive, a divided segment engaging the rack bar, a spring connection between the respective segment sections, stop means limiting movement of the bar, and means to operate the segment, one of said segment sections being movable relatively to the other against tension of said spring upon engagement of the bar with the stop means aforesaid, as and for the purpose set forth.

13. In a press attachment, a movable guard, a reciprocable bar, cam devices operable through movement of said bar, means operable through movement of said cam devices to move said guard, the said last mentioned means operating at intervals to permit said guard to intermittently remain inactive, and means to reciprocate the bar.

14. In a press attachment, the combination with the control means for the press, of a movable guard, a support therefor, rack bars mounted to directly engage the said support and to reciprocate alternately in opposite directions, cam devices engaging the respective rack bars for reciprocating them, and means controlling movement of the respective cam devices.

15. In a press attachment, a guard member, a turnable support therefor, a pinion mounted on the said support, rack bars mounted to engage the pinion at substantially diametrically opposite points and to move simultaneously in opposite directions, rotatable cam devices engaging the respective bars, and means to actuate the said cam devices for imparting to the guard member an intermittent rotary movement.

16. In a press attachment, a guard member, and means including simultaneously and oppositely reciprocable rack bars to impart to said guard member an intermittent swinging movement.

17. In a press attachment, a movable guard, a support means therefor, means engaging the guard support to move it, and cam devices engaging said last mentioned means, said cam devices operating to permit the guard to remain inactive at intervals during movement.

18. In a press attachment, a guard member, means to impart to said member an intermittent movement between the dies of the press, and opposed cam devices actuatable to directly control movement of said guard.

19. In a press attachment, a guard mov-

able in a substantially horizontal plane, a support for the guard, rack bars mounted to engage the support at substantially diametrically opposite points and to impart thereto a swinging movement, cam devices directly engaging the respective bars, a shaft support for the respective cams, a gear mounted on said shaft, a rack bar reciprocable to rotate the gear, and means to reciprocate said last mentioned rack bar.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM DICKS.

Witnesses:
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WILLIS H. HALL.