Nov. 14, 1933. J. E. LOSHBOUGH 1,934,984

BRAKE RELEASE MECHANISM FOR PRESSES

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Fig. 1.

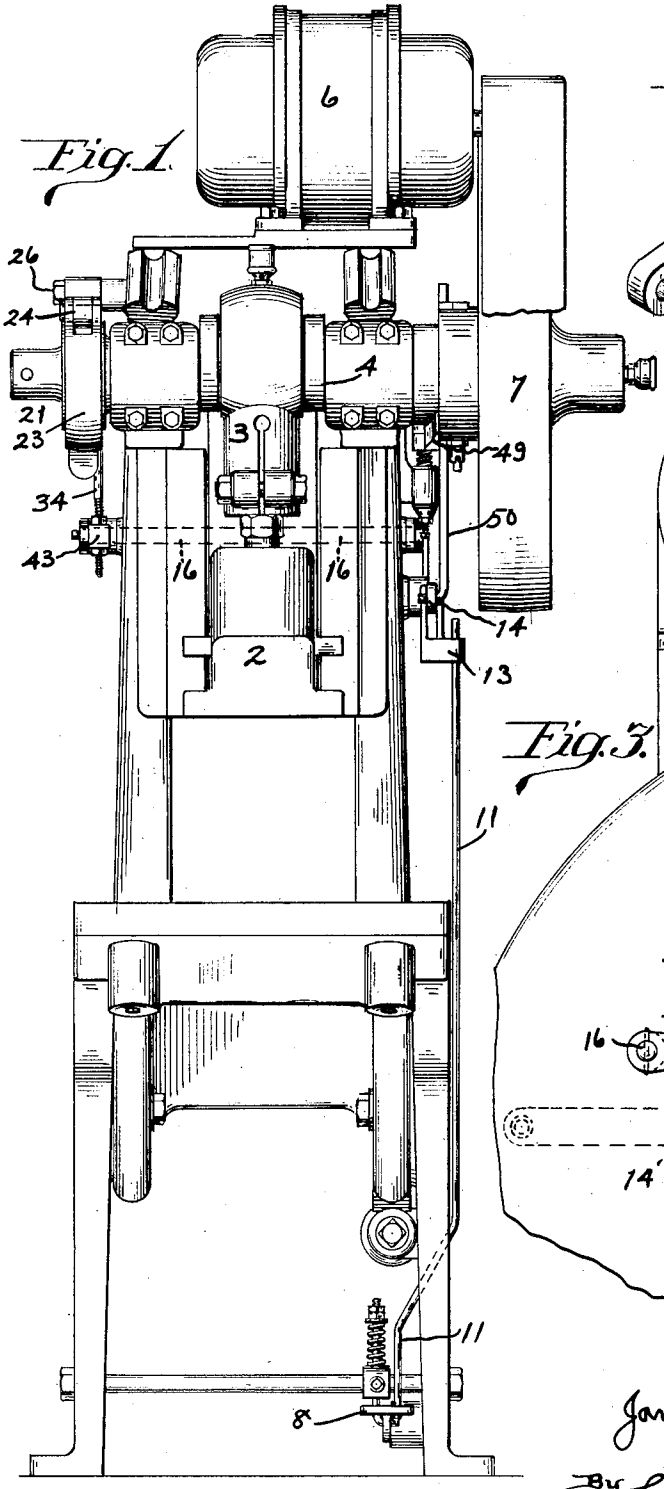


Fig. 7.

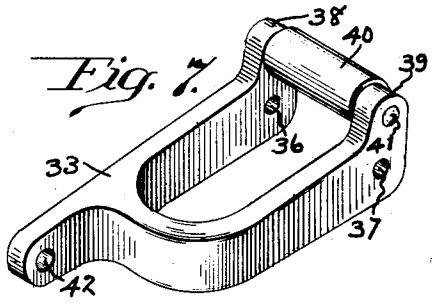
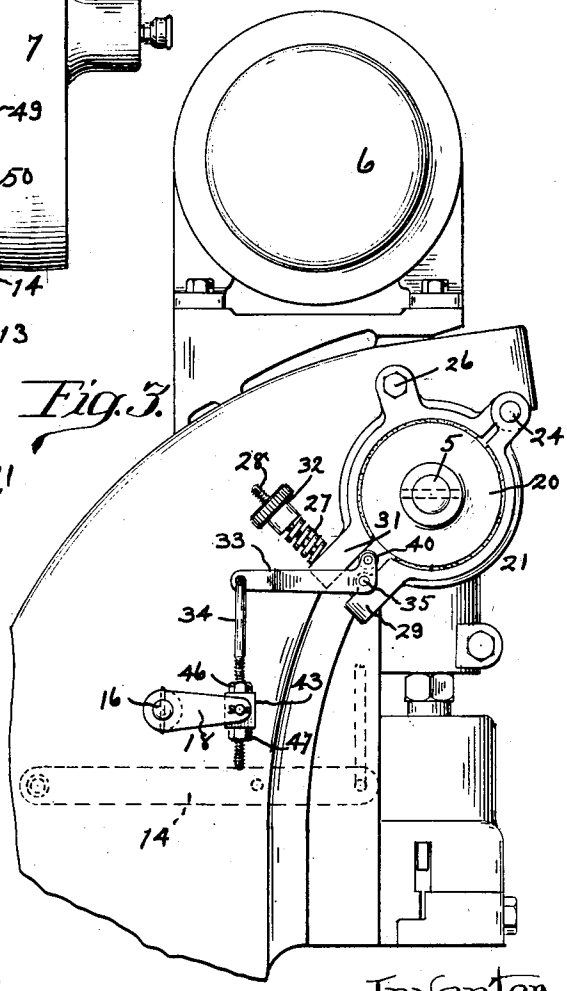


Fig. 3.



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Fig. 2.

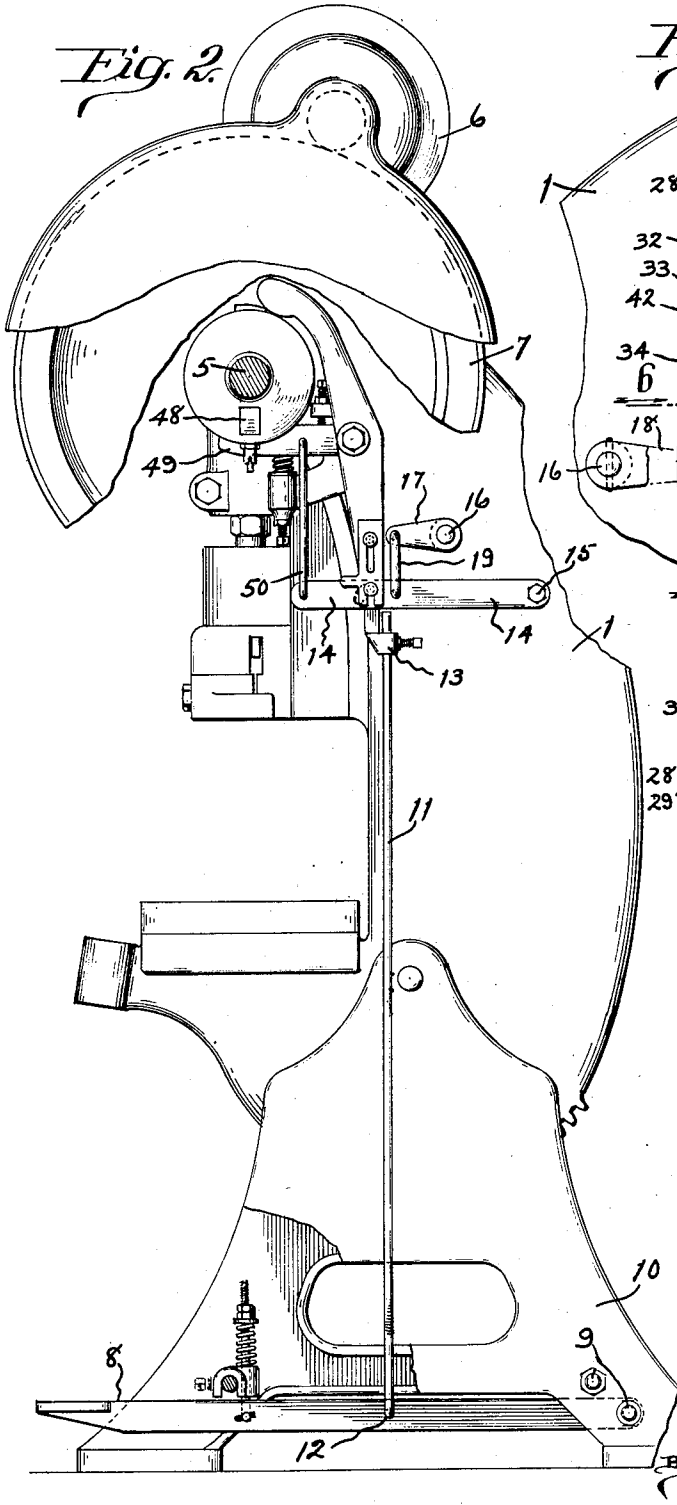


Fig. 4.

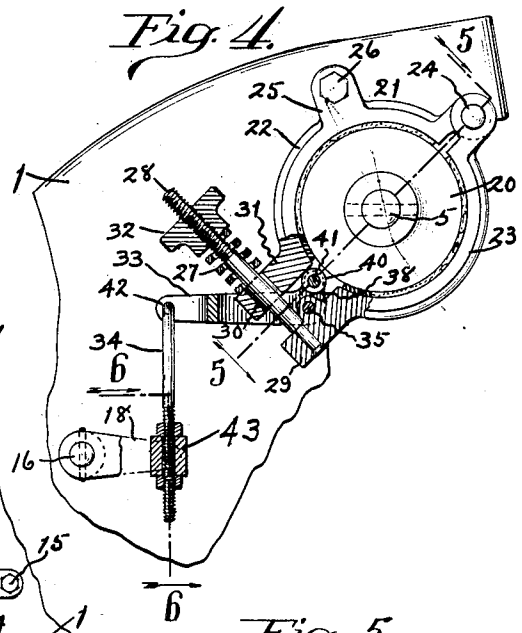


Fig. 5

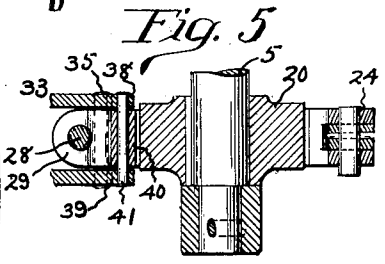
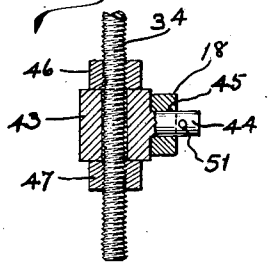


Fig. 6.



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Patented Nov. 14, 1933 1,934,984

UNITED STATES PATENT OFFICE

1,934,984

BRAKE RELEASE MECHANISM FOR PRESSES

James E. Loshbough, Elkhart, Ind.

Application March 7, 1930. Serial No. 434,121

5 Claims. (Cl. 192—144)

My invention relates to power presses, and particularly to the brake mechanism therefor.

In power presses the crank-shaft rotation, which operates the press ram, is retarded or stopped by a friction brake which imposes a continuous load thereon for the full revolution of the crank-shaft, and such a condition in the press requires more power to operate the press than would be necessary if the brake functioned for a fraction only of each revolution of the crank-shaft.

The principal object of this invention is to provide brake release means to relieve the crank-shaft of a power press of the brake load or influence for a portion of each revolution of the crank-shaft, thereby economizing in power and materially reducing the degree of heat generated in the brake.

Other and more specific objects of the invention are mentioned and suggested by the mechanical disclosures herein.

The preferred embodiment of my invention is illustrated in the accompanying drawings, wherein

Figure 1 is a front elevational view of a power press to which my invention is applied;

Fig. 2 is a side elevation thereof, partially broken away;

Fig. 3 is a fragmental view in elevation of the upper end of the press which carries the crank-shaft brake mechanism;

Fig. 4 is a similar view, partially in section;

Fig. 5 is a section taken on line 5—5 of Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 4; and

Fig. 7 is a perspective view of the brake actuating lever.

Similar numerals of reference indicate like parts throughout the several views on the drawings.

Referring to the details of the drawings the numeral 1 represents the press main frame in which is mounted the reciprocatory ram 2 which is operatively connected with the pitman 3, the latter being operatively connected with the usual crank 4 of the conventional crank-shaft 5 which is rotatably mounted in the press frame. The shaft 5 may be driven by any suitable power means, but in the drawings an electric motor 6 is illustrated as a source of power for rotating the fly-wheel 7, normally loose on shaft 5, said fly-wheel being adapted to be releasably clutched to the shaft 5 by a spring pressed sliding clutch 48 under the control of the usual tiltable detent cam lever 49 which is retractable by link 50, the latter being operatively connected with the outer end of the lever 14, and operative thereby, as hereinafter described.

The numeral 8 indicates a spring retracted foot pedal pivotally mounted in the press base 10 at 9, depression of said pedal being adapted to control the operation of the press, as is well known, said pedal being associated with the upright link element 11 which has its lower end connected therewith at 12, the upper end of said link being operatively connected with the depending element 13 which is connected with the downwardly tiltable lever 14 which has its end pivotally mounted in the press frame at 15.

The numeral 16 indicates a horizontal rock-shaft journalled in the frame 1 and extending transversely therethrough behind the ram 2, one end of said shaft having the lever arm 17 rigidly connected therewith, and the opposite end thereof having a similar lever arm 18 rigidly connected therewith. The lever 17 is arranged above the lever 14 and connected therewith by a link 19, whereby, when pedal 8 is depressed, the arm 17 is downwardly tilted, thereby rocking shaft 16 and downwardly tilting lever arm 18.

The numeral 20 indicates a cylindrical brake drum rigidly mounted on and adjacent the end of shaft 5 and emcompassed by the split, two piece brake-band 21 which comprises the two arcuate half sections 22 and 23 hinged together at 24 and rigidly mounted in the press frame by lug 25, integral with brake band section 22, which is mounted upon the anchorage stud or bolt 26 rigid with the press frame. Normally, the brake band 21 is yieldably clamped about the drum 20, but the hinge element at 24 enables brake release from the drum by spreading the two sections 22 and 23, as hereinafter described. The clamping action of brake band 21 is effected by the compression coil spring 27 carried on the stud 28 which has its lower end rigidly mounted in the lug 29 of band section 23, and which extends loosely through aperture 30 in lug 31 of band section 22, said spring being compressed between said lug 31 and the adjustable nut 32 which is screw threaded upon the upper end of the stud 28. Regulation of the tension of spring 27 may be made by the adjustment of the nut 32 longitudinally of stud 28.

Spreading of the two band sections 22 and 23 to relieve drum 20 of the brake friction thereon is accomplished by a forked lever 33 and link 34 which is connected with the outer end of the tiltable lever arm 18.

The end of each of the two forks of lever 33 gains a pivotal bearing on a pin 35 mounted in the brake band lug 29, said pin engaging in fork apertures 36 and 37 of said lever, each of said fork ends having a relatively short lateral lever arm, 38 and 39 respectively, projecting therefrom. A bearing roller 40 is rotatably mounted between the lever arms 37 and 38 on a bearing pin 41 connecting said arms adjacent the outer ends thereof, said roller normally bearing against the inner face of band lug 31 when brake

band 21 is compressed about drum 20. In this arrangement of the parts and elements described the spring carrier stud 28 and band lug 31 are disposed between the two forks of the lever 33 with sufficient clearance to permit the free movement of all the elements mentioned.

The top end of the link 34 may have a hook-like connection with an aperture 42 formed in the extremity of the lever 33, and the lower end of said link may be adjustably mounted in a block 43 which is pivotally mounted in the end of lever 18. The block 43 has a lateral stud 44 integral therewith which is pivotally mounted in an aperture 45 formed transversely in the end of lever 18, and link 34 is screw threaded through the block body 43 to enable adjustment thereof in said block. Jam nuts 46 and 47 are threaded upon link 34 above and below the block 43 to maintain the vertical adjustment of said block, and a cotter key 51 in stud 44 prevents displacement of said stud from its bearing aperture 45. Vertical adjustment of the link 34 in block 43 readily enables the proper adjustment of the roller 40 in lever 33 in its relation to band lug 31. It will be evident that the lever 33, when downwardly swung as described, will cause the brake band section 23 to be disengaged from the drum, thereby relieving the drum and shaft 5 of much brake retardation.

It will also be evident from the foregoing that the brake drum 20 is disengaged from the brake band section 23 as long as the pedal 8 is held depressed by the operator, and that, upon release of said pedal, the brake band section 23 is caused to reengage the brake drum by action of the spring 27.

I claim:

1. The combination with a power press provided with a driven shaft, a clutch for actuating said shaft, and mechanism for shifting said clutch including a depressible pedal, of a brake for said shaft and including a drum rigid with said shaft, and a pair of arcute brake band members encompassing said drum and normally spring presses into engagement therewith, said brake band members having spaced adjacent ends provided with laterally projecting lugs, and means for releasing said brake band members from said drum, said means comprising a shifting lever pivotally mounted in one of said brake band lugs and between said brake band lugs, said shifting lever being provided with a lateral arm which coacts with the brake band lug opposite the lug in which said lever is mounted, and means connected with said pedal for tilting said shifting lever and operative upon depression of said pedal.

2. The combination with a power press provided with a driven shaft, a clutch for actuating said shaft, and mechanism for shifting said clutch including a depressible pedal, of a brake for said shaft and including a drum rigid with said shaft, and a pair of arcuate brake-band members encompassing said drum and normally spring pressed into engagement therewith, said brake-band members having spaced adjacent ends, and means for releasing said brake-band members from said drum, said means comprising a furcated shifting lever pivotally mounted in the end of one of said brake-band members and between said brake band ends, each fork of said shifting lever being provided with a lateral arm, said shifting lever lateral arms carrying a roller which engages with the end of the other brake-band member, and means connected with said pedal for tilting said shifting lever and operative upon depression of said pedal.

3. The combination with a power press provided with a driven shaft, a clutch for actuating said shaft, and mechanism for shifting said clutch including a depressible pedal, of a brake for said shaft and including a drum rigid with said shaft, and a pair of arcuate brake-band members encompassing said drum and normally spring pressed into engagement therewith, said brake-band members having spaced adjacent ends, and means for releasing said brake-band members from said drum, said means comprising a shifting lever pivotally mounted in the end of one of said brake-band members and provided with a lateral arm which coacts with the end of the other brake-band member, and means connected with said pedal for tilting said shifting lever and operative upon depression of said pedal, said means including a rock-shaft mounted in the press frame, a lever arm on said rock-shaft, linkage connecting said rock-shaft with said pedal, and an adjustable link connecting said lever arm and shifting lever.

4. The combination with a power press provided with a driven shaft, a clutch for actuating said shaft, and mechanism for shifting said clutch including a depressible pedal, of a brake drum rigidly mounted on said shaft, a pair of arcuate brake-band members mounted in the press frame, encompassing said drum and normally spring pressed into engagement with said brake drum, said brake-band members having spaced adjacent ends, means for releasing said brake-band members from said drum, said means comprising a shifting lever pivotally mounted in the end of one of said brake-band members and provided with a pair of lateral arms and a roller mounted upon said lateral arms, said roller engaging the end of the other brake-band member, and means connected with said pedal for tilting said shifting lever and operative upon depression of said pedal.

5. The combination with a power press provided with a driven shaft, a clutch for actuating said shaft, and mechanism for shifting said clutch including a depressible pedal, of a brake for said shaft and including a drum rigid with said shaft, and a pair of arcuate brake-band members encompassing said drum and normally spring pressed into engagement therewith, said brake-band members having spaced adjacent ends, and means for releasing said brake-band members from said drum, said means comprising a shifting lever pivotally mounted in the end of one of said brake-band members and provided with a lateral arm which coacts with the end of the other brake-band member, and means connected with said pedal for tilting said shifting lever and operative upon depression of said pedal, said means including a rock-shaft mounted in the press frame, linkage connecting said rock-shaft with said pedal, a link operatively connected with said shifting lever, and an adjustable block mounted on said link, said lever arm being pivotally connected with said adjustable block.

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