

Nov. 28, 1950

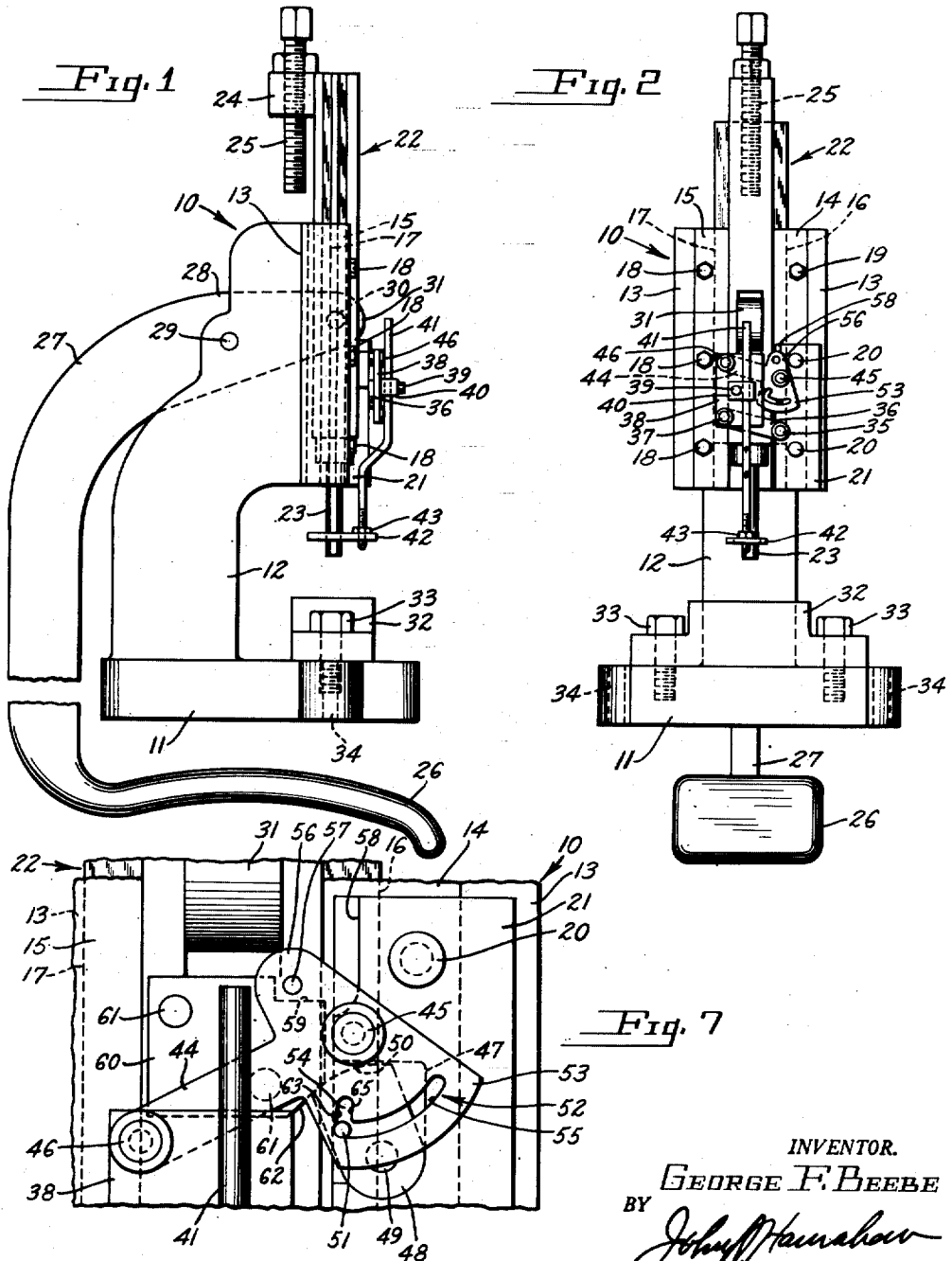
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2,531,837

SAFETY GUARD FOR PRESSES

Filed Nov. 2, 1948

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

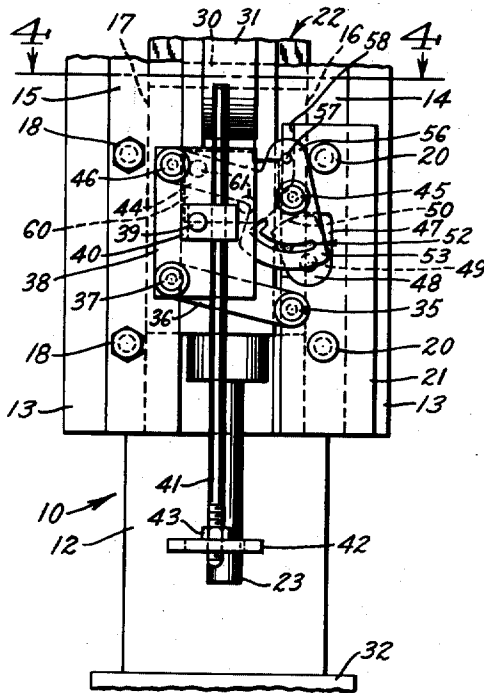


Fig. 3

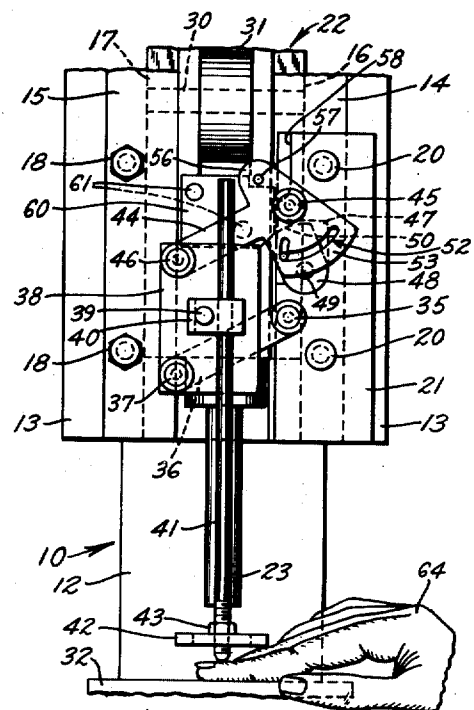


Fig. 5

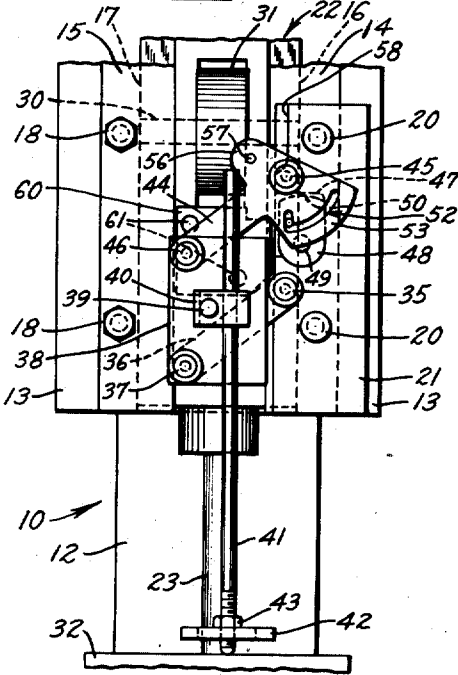


Fig. 6

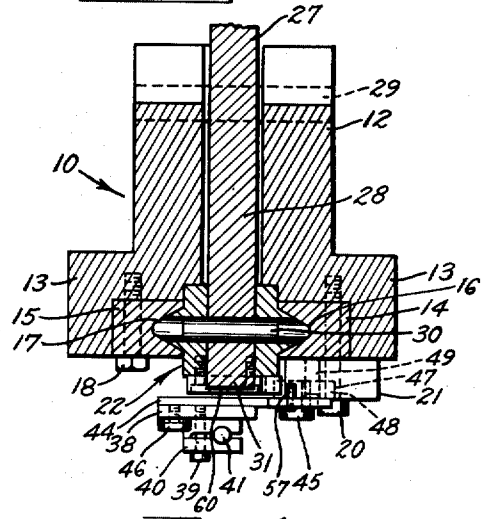


Fig. 4

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SAFETY GUARD FOR PRESSES

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Application November 2, 1948, Serial No. 58,000

7 Claims. (Cl. 192-137)

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This invention relates to new and useful improvements in safety devices and has particular relation to a guard for machines of the type including a vertically movable plunger although, as herein disclosed, the guard is specifically for a foot operated type of press.

An object of the invention is to provide a guard for and in a machine of the character indicated and including a feeler means movable in advance of the machine tool and a lock means for positively locking the machine plunger against downward movement, the former being interconnected with the latter in such a manner as to bring about locking of the plunger against complete downward movement or a complete downward stroke on said feeler means contacting an object, as the hand or finger of an operator, short of its full movement or its movement to which it is adapted in the usual safe operation of the machine.

Another object is to provide for and in a machine a safety guard means movable downwardly by gravity in advance of the machine plunger and upwardly by the machine plunger on return movement of the latter in combination with means under the control of said feeler means to cause stoppage of downward movement of the plunger on said feeler means engaging an object short of its normal full downward movement.

A further and more specific object is to provide in a machine including a head having a vertical way therein and a punch carrying plunger reciprocable in said way, a block rigidly attached to said plunger and projecting forwardly from said way, a mounting plate fixed to said head at one side of said way, a locking cam pivoted to said plate for movement into and out of the path of movement of said block, a pair of vertically spaced arms pivoted each at one end to said plate, a carrier plate spaced horizontally from said mounting plate, means pivoting the other ends of said arms to said carrier plate in the same spaced relation as the first mentioned ends of the arms are pivoted to the mounting plate whereby a pantograph-like structure is provided in which the carrier plate is movable in substantially parallel relation with the mounting plate, a feeler bar mounted on said carrier plate and extending downwardly therefrom said plunger, means on one of said arms and having a pin and slot connection with said cam for moving the latter to and from the path of said block to release said plunger for downward movement and to lock it against downward movement, and a connection between one of said arms and said

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movable block whereby as said plunger starts downwardly said carrier plate and feeler rod are released to gravitate downwardly as said arms move about the pivots at their first mentioned ends and said cam is moved out of the path of movement of said plunger carried block and whereby as said plunger and block move upwardly on return movement of these parts said carrier plate and feeler rod are returned to their normal positions as the arms are rocked back on the pivots at their first mentioned ends and on predetermined movement of one such arm the pin and slot connection between its extension and the cam brings the latter back into the path of downward movement of said block.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view showing a foot press equipped with the safety means or guard of the invention;

Fig. 2 is a front elevational view of said press, the view being taken as looking from the right in Fig. 1;

Fig. 3 is a front elevational view on a larger scale of the plunger portion of the press showing the guard in place and with the various parts in retracted position;

Fig. 4 is a transverse sectional view taken along the plane of the line 4-4 of Fig. 3;

Fig. 5 is a view somewhat similar to Fig. 3 but showing the parts as when the press plunger has been arrested or locked due to engagement of the fingers of an operator by the feeler device of the present safety means or guard;

Fig. 6 is a somewhat similar view showing the relation of the parts at the limit of normal downward movement of the press plunger and punch; and

Fig. 7 is an enlarged front elevational view of certain of the parts shown in Fig. 5.

Referring in detail to the drawings, a kicker or foot operated type of press is shown and is generally designated 10. Such press comprises a base 11 supporting an upright 12, the upper forward portion of which is laterally enlarged as at 13 providing a head. Such head is recessed

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in its forward face and in opposite edge portions of said recess are located guides 14 and 15 having V-shaped ways 16 and 17 therein and which ways are in opposing relation. The guide 15 is secured in place as by a series of bolts 18 while the guide 14 is also secured in place by three bolts, one of which, designated 19, passes through the upper portion of the guide and the other two of which are designated 20 and pass not only through the guide but also through a mounting plate 21, the purpose of which will later be set forth. All of these bolts are threaded into the head portion of the upright 13, as best shown in Fig. 4.

Vertically slidable in the ways 16 and 17 of the guides 14 and 15 is a plunger 22 adapted in its lower end to mount a punch or other tool 23, depending on the job to be performed. As best shown in Fig. 4, the plunger 22 projects forwardly out of the guide way provided for it and as shown in Figs. 1 and 2, at its upper end, the plunger has a rearward extension or projection 24 through which is threaded a screw 25 comprising an adjustable stop for limiting downward movement of the plunger with respect to the above mentioned head formed on the upper portion of the upright 12.

A treadle 26 is integral with or otherwise made rigid with an arm 27 shown as having its upper portion curved forwardly as at 28. Inwardly of its upper end, arm 27 is pivotally mounted at 29 on the upright 12 and then the forward end of said arm is, by means of a pin or the like 30, secured to the plunger 22. This forward end of arm 27 I have designated 31 and it will be noted that the same passes through the plunger 22 as well as being secured to the latter by the pin or other pivot 30. With this construction it will be understood, especially with reference to Fig. 1, that on the treadle 26 being rocked downwardly and rearwardly, the arm 27 turns on a pivot 29 whereby the forward end 31 of said arm moves downwardly carrying the plunger 22 with it.

Downward movement of the plunger will be limited by the screw 25 and/or by the punch 23 engaging or completing its work. In this connection, a die holder or work supporting block or the like 32 is shown as secured to the upper side of base 11 by machine screws 33, such die holder or work support being located beneath the punch 23. Base 11 is shown as in its opposite edges provided with openings or channels 34 for the passage of clamps or clamp bolts for anchoring the press to any suitable support. The press, as thus far described, is old and well known and is disclosed here in order that the application and operation of my guard or safety device may be better understood.

Such guard or safety device includes the mounting plate 21 previously mentioned. A pivot means 35 pivotally secures one end of an arm of link 36 to the mounting plate 21 while a pivot means 37 pivotally secures the other end of said arm or link to a lower portion of a carrier plate 38. Fixed to this carrier plate, in any suitable manner, as by means of a screw 39 is a clamp 40 through which passes a vertically disposed feeler rod 41. Clearly, on loosening of the screw 39 such feeler rod may be adjusted vertically through the clamp 40 and thereafter on tightening of the screw the feeler rod is secured in adjusted position.

Fixed on the lower end of this feeler rod is any desired type of finger or hand engaging

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means 42, here disclosed as a U-shaped means, the arms of which straddle the punch 23. The position of the U-shaped means is controlled by a lock nut 43 adjustable on the lower portion of said feeler rod 41 although, generally speaking, any adjustment made and involving the feeler rod is made on loosening and thereafter tightening of the clamp 40 as above set forth.

A second arm 44 is pivotally mounted on the plate 21 by a pivot means 45 located in vertically spaced aligned relation with the pivot means 35. Also, a pivot means 46 pivotally secures the other end of the arm 44 to the carrier plate 38 in aligned vertically spaced relation to the pivot means 37. Thus, it will be seen that a pantograph-like structure is formed.

A notch or recess 47 is formed opening through the forward face and the inner edge of the mounting plate 21 and such notch or recess is of a size and shape to wholly or substantially wholly receive a cam 48 when such cam is in unlocked or released position, as shown in Fig. 6. This cam is mounted on a pivot 49 and includes an upper curved or arcuate surface 50. Additionally, rigid with the cam and extending forwardly therefrom is a pin 51 projecting into or through a slot 52 in a plate-like extension 53 of the arm 44. As here shown, this plate-like extension and the arm 44 are all blanked or otherwise formed from a single piece of metal. Slot 52 is somewhat L-shaped and includes a vertical toe-like portion 54 as well as an arcuate portion 55.

In addition to the extension 53 which projects from the under or lower side of arm 44, there is integral with such arm and projecting from the upper side or edge thereof, adjacent the end mounted on the pivot 45, a second extension 56 carrying a pin 57 projecting at the inner side of said extension 56. This projecting portion of the pin cooperates with the horizontal surface 59 at one upper corner of a locking plate 60 secured to the forward side or face of the plunger 22 as by machine screws 61. One lower corner of this plate 60 is cut away providing an arcuate surface 62 on the same length radius as and for cooperation with the curved surface 50 of the cam 48, as will be set forth.

When mounting the present guard or safety device on the press 10, it is preferred to remove the two screws which normally occupy the position of the screws 20 and then locate the mounting plate by aligning holes in it with the screw holes in the guide 14 and then employing the longer bolts 20 to secure this mounting plate in place. The lock plate 60 is positioned on the plunger 22 in accordance with the location of the mounting plate 21. As this description proceeds, it will become apparent that the lock plate 60 is but a portion rigid with the plunger 22 and but for inconvenience and expense in manufacture and assembly of a new press could be an integral part of the plunger of such new press.

The above described pantograph-like means including the arms 36 and 44 and the carrying plate 38 and the feeler mechanism mounted on the latter are all adapted for pantograph-like movement on rocking of the arms about the respective pivot means 35 and 45. The cam 48 is also pivoted for free movement. Since the stud or pin 57 is rigid with the arm extension 56, when the plunger 22 is moved toward its return or upper position, its lower surface 59 engaging the extension of pin 57 carries the same upwardly thereby through the extension 56 rock-

ing the arm 44 in a clockwise direction whereby said arm is swung upwardly, as from any of the positions of Figs. 5, 6 and 7 to the position of Figs. 2 and 3.

This arm being attached to the carrier plate 38 by pivot 46, such plate is carried upwardly and through its connection by pivot 37 with arm 36 carries said arm upwardly. Also, this described upward movement of the plate 38 results in upward or return movement of the feeler rod 41. Thus, it will be understood that on any return movement of the plunger 22, the parts of the present guard or safety device are given a return movement. Also, it is noted that since at the end of any return movement the extension of pin 57 will be in engagement with the lock block 60, the parts of the safety device will be held in their upper or return or normal positions.

In connection with this matter of the return of the parts by the plunger 22 on return movement of the latter, it is noted that a channel or groove or elongated corner notch 58 is provided in the forward corner of the upper inner edge of the mounting plate 21. The right hand edge of the lock plate 60 is adjacent this inner edge of the mounting plate 21. Also, the projecting portion of pin 57 is of a diameter to be received in the notch 58 as seen in Figs. 2 and 3. Therefore, on the return movement of the plunger 22, the lock plate 60 carried by said plunger through its portion 59 engages and raises the pin and the other parts of the safety device as previously described. However, since the raising movements of the guard parts includes a swinging movement of arm 44 on pivot 45, the pin 57 moves on an arc upwardly and to the right as the machine is shown in front elevation. The parts are movable sufficiently to have the projecting portion of the pin move entirely into the notch 58. This allows for excessive upward movement of the plunger 22 and lock plate 60 without damage to the pin 57 or any other part. When any such movement occurs, the pin will be held by a side or vertical edge of plate 60, rather than by a horizontal or top edge of the latter.

The mentioned return or upper positions are as especially shown in Figs. 2 and 3. There it will be noted that the pin 51 of the cam 48 is in the curved portion 55 of the slot 52 and that such cam is tilted partly out of its pocket or socket 47 so as to partly project under the lock block 60. Specifically, a portion of the curved surface 50 of the cam is below and in alignment with a portion of the curved surface 62 of the lock block. The slot portion 55 is shown as somewhat excessive in length to allow for a greater return movement of the plunger than that here illustrated should such return movement be desired.

The plunger 22 being in its upper position, the operator will place a piece of work on the holder 32 and then operate the lever 27 to depress the plunger and bring the punch 23 against the work. At the start of this movement, the parts will be positioned as best shown in Fig. 3. As the plunger starts downwardly it carries the lock block 60 with it and the surface 59 of the latter falls away from the pin 57 whereby the assembly comprising the arms 36 and 44 and the carrier plate 38 are released for gravitational movement and such assembly falls downwardly rocking about the pivots 35 and 45.

Normally, the feeler device 42 is in a retracted position above the lower end of the punch 23 as in Fig. 3 so as not to interfere with the operator

when loading the press. However, as the plunger 22 starts downwardly and the safety assembly is released, it falls ahead of the punch so that the feeler device 42 moves to a position below the lower end of the punch. Also, as such safety device rocks about the pivots 35 and 45, the extension 53 of the arm 44 is rocked as from the position of Fig. 3 to that of Fig. 6. As this occurs, the toe portion 54 of the slot 52 comes opposite the pin 51 and the wall portion 63 of said slot engages the pin and pressing on the latter, as the movement of the extension 53 continues, forces the pin and thereby the cam 48 to move in a clockwise direction about the pivot 49 of the cam (during such movement, as the cam moves on its pivot, the pin 51 enters the slot portion 54) so that the cam is moved from its locking position of Fig. 3 to its released position of Fig. 6.

In the former of these positions, it will be seen that the cam is projecting into the path of movement of the lock block 60 while in the latter of these positions the cam is wholly or substantially wholly within the socket 47 and clear of the path of movement of the said lock block. Thus, the lock block and therefore the plunger 22 may be given a complete downward movement to have the punch 23 perform its desired function. At this time, the feeler rod 41 is moved all the way down but since there was no obstruction has not performed any function. Now, on release of the treadle 26, the plunger 22 is returned to its upper or normal position and by engagement of the surface or shoulder 59 of the lock block 60 with the pin 57 has brought about return movement of the various parts of the present safety device or guard.

The above describes the normal operation of the press or the operation of the press when the operator has been careful to keep his hands or fingers from any dangerous position with respect to the punch 23. Fig. 5 illustrates what occurs when the operator carelessly or otherwise has his fingers in a position to be injured. In such view, a portion of the operator's hand is suggested at 64. According to the disclosure in Fig. 5, the plunger 22 has started downwardly, the surface 59 of the lock block 60 has moved downwardly from under the pin 57 and the various elements of the present safety device (which elements include the arms 36 and 44 and the carrier plate 38) have also started downwardly. However, the feeler 42 could not complete its downward movement and moving ahead of the punch 23 has engaged the fingers of the hand 64. It is to be borne in mind that this safety device including the feeler 42 moves downwardly only under the influence of gravity. Thus, there is not enough weight or momentum to injure the operator's hand or fingers.

Downward movement of the feeler having been arrested, the carrier plate 38 is held against further downward movement and thus the arms 36 and 44 (and at this time we are particularly concerned with the latter) have had but limited movements about their pivots 35 and 45, respectively. Since movement of the arm 44 has been limited, its extension 53 has had limited movement and has not moved sufficiently to pick up the pin 51 and shift it and the cam 48 about the pivot 49 whereby to carry the cam out of the path of movement of the lock block 60.

Thus, as illustrated in Fig. 5, this lock block is still positioned with a portion of its arcuate surface 50 in the path of movement of the arcuate surface 62 of the lock block and has engagement

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with such latter surface. Therefore, the cam is presenting a positive lock preventing movement of the plunger 22 downwardly for any distance greater than that illustrated. The distance between the arcuate surfaces 50 and 62, when the parts are in their upper positions or their normal positions, represents the length of movement which may be imparted to the punch 23 following engagement of an object by the feeler device 42. Usually I construct the parts so as to have downward movement of the punch 23 stopped in about one quarter of an inch of movement following engagement of the fingers or the like by the feeler device 42.

When the treadle is released with the parts positioned as in Fig. 5, the plunger 22 is free to move upwardly and since it moves the lock block 60, the latter will engage pin 57 and the parts of the present safety device will be carried upwardly. This has no particular effect on the cam 48 since the long part or portion 55 of the slot 52 provides for a rocking movement of the arm 44 and its extension 55 on the pivot 45 without any binding against the pin 51. The arcuate surfaces 50 and 62 being complementary or on equal length radii, there is no tendency for one to cam the other aside when they come into contact.

When the plunger has been given the full movement, as suggested in Fig. 6, for the normal return of the parts the surface portion 65 of the toe portion 54 of slot 52 forces the pin 51 out of such toe portion of the slot and into the long portion of the slot whereby the extension 53 of the arm 44, swinging on the pivot 45, does not bind or in any way tightly engage with the pin 51.

Having thus set forth the nature of my invention, what I claim is:

1. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, said mounting plate having a notch opening through its forward side and its inner edge, a cam, means pivotally mounting said cam for movements between a position substantially wholly within said notch and out of the way of said lock plate and a locking position projecting through the edge of said notch and into the path of movement of said lock plate, a carrier plate movable vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through the open side of said notch and through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting through the edge of said notch into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lowest position said feeler means is in its lowest position and said extension-like part is positioned with said pin in the second portion of

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said slot and said cam is substantially wholly within said notch and clear of the path of downward movement of said locking plate, a stud rigid with the upper of said arms and movable with the latter from a position at a side of the path of movement of said locking plate to a position in such path and extending over the upper edge of the locking plate whereby as said plunger and plate move downwardly said stud is released and said arms, carrier plate and feeler rod gravitate downwardly as said arms turn about the means pivoting them to the mounting plate and said feeler means moves ahead of the plunger, and as said plunger and plate move upwardly the upper edge of the plate engages said stud and moves the same upwardly moving said arms in the opposite direction on their mentioned pivots and raising the feeler rod and means.

2. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, said mounting plate having a notch opening through its forward side and its inner edge, a cam, means pivotally mounting said cam for movements between a position substantially wholly within said notch and out of the way of said lock plate and a locking position projecting through the edge of said notch and into the path of movement of said lock plate, a carrier plate movable vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through an open side of said notch and through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting through the edge of said notch into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lower position said feeler means is in its lower position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is substantially wholly within said notch and clear of the path of downward movement of said locking plate, a stud rigid with the upper of said arms and movable with the latter from a position at a side of the path of movement of said locking plate to a position in such path and extending over the upper edge of the locking plate whereby as said plunger and plate move downwardly said stud is released and said arms, carrier plate and feeler rod gravitate downwardly as said arms turn about the means pivoting them to the mounting plate and said feeler means moves ahead of the plunger, as said plunger and plate move upwardly the upper edge of the plate engages said stud and moves the same upwardly moving said arms in the opposite direction on their mentioned pivots and raising the feeler rod and means, and said feeler means adapted on engagement with an object during downward gravitational movement of said feeler means to

act through said feeler rod and maintain said carrier plate and arms against further movement in a direction to have the extension-like part of the upper arm move to receive the pin in the second portion of said slot.

3. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, a cam, means pivotally mounting said cam on said mounting plate for movements between a position projecting into the path of downward movement of said lock plate and a position clear of such path of movement, a carrier plate movable vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lowest position said feeler means is in its lowest position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is clear of the path of downward movement of said locking plate, a stud rigid with the upper of said arms and movable with the latter from a position at a side of the path of movement of said locking plate to a position in such path and extending over the upper edge of the locking plate whereby as said plunger and plate move downwardly said stud is released and said arms, carrier plate and feeler rod gravitate downwardly as said arms turn about the means pivoting them to the mounting plate and said feeler means moves ahead of the plunger, and as said plunger and plate move upwardly the upper edge of the plate engages said stud and moves the same upwardly moving said arms in the opposite direction on their mentioned pivots and raising the feeler rod and means.

4. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, a cam, means pivotally mounting said cam on said mounting plate for movements between a position projecting into the path of downward movement of said lock plate and a position clear of such path of movement, a carrier plate movable vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including sub-

stantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lowest position said feeler means is in its lowest position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is clear of the path of downward movement of said locking plate, a stud rigid with the upper of said arms and projecting rearwardly therefrom into the path of movement of said lock plate whereby on upward movement of said plunger said stud is engaged by said plate and said carrier plate, arms and said feeler rod are moved upwardly as said arms swing on their pivotal mountings on the mounting plate and whereby on downward movement of the plunger said stud is released and said arms and carrier plate gravitate downwardly as said arms pivot in the opposite direction, and said feeler means adapted on engagement with an object during downward movement of said feeler means to act through said feeler rod and maintain said carrier plate and arms against further movement in a direction to have the extension-like part of the upper arm move to receive the pin in the second portion of said slot whereby said plunger is locked against all but limited downward movement.

5. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, a cam, means pivotally mounting said cam on said mounting plate for movements between a position projecting into the path of downward movement of said lock plate and a position clear of such path of movement, a carrier plate movable vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lowest position said feeler means is in its lowest position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is clear of the path of downward movement of said locking plate, means whereby on its upward movement said plunger moves said arms, carrier plate and feeler means upwardly swinging said arms on their pivotal connections with the mounting plate and whereby on downward movement of the plunger said arms, carrier plate and feeler means are released to gravitate down-

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wardly as said arms swing in the opposite direction, and said feeler means adapted on engagement with an object during downward movement of said feeler means to act through said feeler rod and maintain said carrier plate and arms against further movement in a direction to have the extension-like part of the upper arm move to receive the pin in the second portion of said slot.

6. In a machine, a stationary head and a plunger mounted said head for vertical reciprocating movement, a lock plate rigid with said plunger and projecting at the forward side of said head, a mounting plate on the forward side of said head at one edge of said lock plate, said mounting plate having a notch opening through its forward side and its inner edge, a cam, means pivotally mounting said cam for movements between a position substantially wholly within said notch and out of the way of said lock plate and a locking position projecting through the edge of said notch and into the path of movement of said lock plate, a carrier plate movably vertically in a plane forwardly of said lock plate, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler rod, means securing said feeler rod to said carrier plate for vertical adjustment relative thereto, a feeler means on the lower end of said feeler rod, an extension-like part rigid with the upper of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through the open side of said notch and through said slot, said parts related whereby when said upper arm is in its upper position said pin is in the first portion of said slot and said cam is projecting through the edge of said notch into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said upper arm is in its lowest position said feeler means is in its lowest position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is substantially wholly within said notch and clear of the path of downward movement of said locking plate, cooperating means between said plunger and one of said arms for raising said arms and carrier plate by swinging the arms on their pivoted connections with the mounting plate as said plunger is moved upwardly in said head, said means adapted to release said parts as said plunger moves downwardly in said head, and said parts adapted on release to gravitate downwardly whereby on said feeler means engaging an obstruction further downward gravitational movement of said parts

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is prevented and said cam remains in the first mentioned position and said plunger is locked against all but limited downward movement in said head.

7. In a machine, a stationary head and a plunger mounted on said head for vertical reciprocating movement, a lock plate rigid with said plunger, a mounting plate on said head, a cam, means pivotally mounting said cam on said mounting plate for movements between a position projecting into the path of downward movement of said lock plate and a position clear of such path of movement, a carrier plate movable vertically in a single plane, a pair of vertically spaced parallel arms pivoted at their respective ends to said mounting plate and carrier plate, a vertical feeler, means securing said feeler to said carrier plate for vertical reciprocating movement therewith, an extension-like part rigid with one of said arms and having a slot therein including substantially right angularly related portions, a pin rigid with said cam in spaced relation to the pivotal mounting of the cam and extending through said slot, said parts related whereby when said one arm is in its upper position said pin is in the first portion of said slot and said cam is projecting into the path of downward movement of said locking plate to positively limit downward movement of said plunger and whereby when said one arm is in its lowest position said feeler is in its lowest position and said extension-like part is positioned with said pin in the second portion of said slot and said cam is clear of the path of downward movement of said locking plate, means whereby on its upward movement said plunger moves said arms, carrier plate and feeler means upwardly swinging said arms on their pivotal connections with the mounting plate and whereby on downward movement of the plunger said arms, carrier plate and feeler are released to gravitate downwardly as said arms swing in the opposite direction, and said feeler adapted on engagement with an object during downward movement of said feeler to maintain said carrier plate and arms against further movement in a direction to have the extension-like part of said one arm move to receive the pin in the second portion of said slot.

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