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2,473,167

TWO-HAND CONTROL

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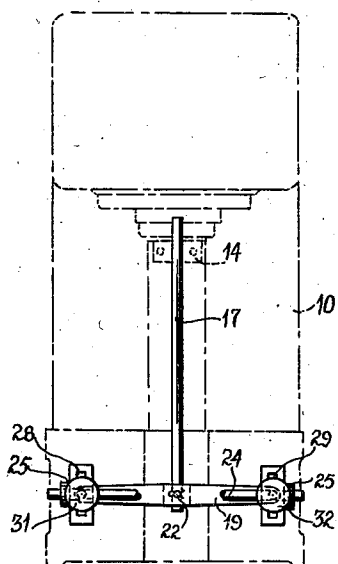


FIG. 1

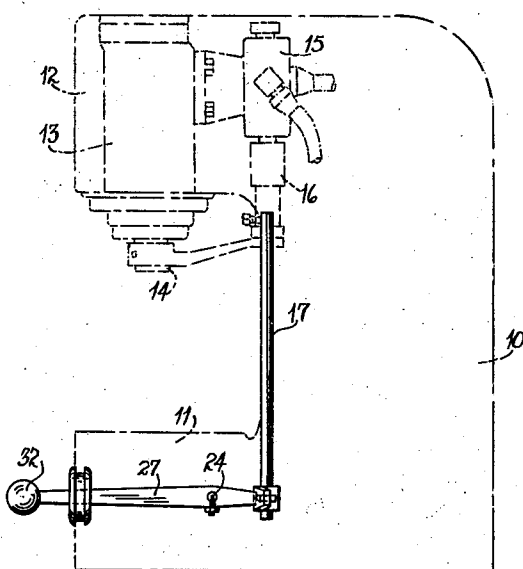


FIG. 2

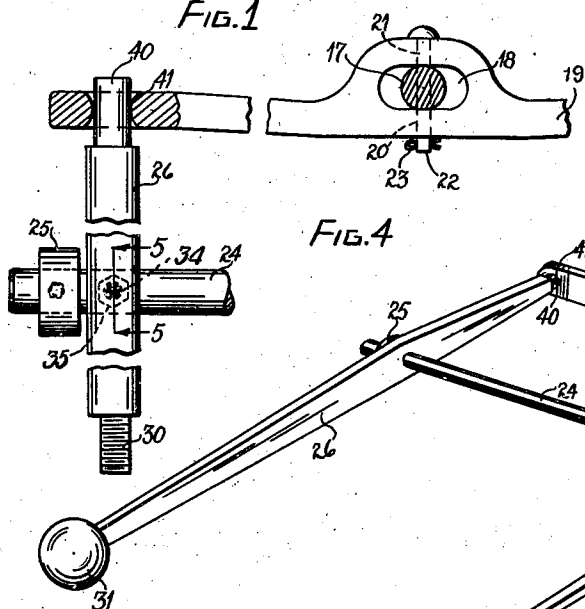


FIG. 4

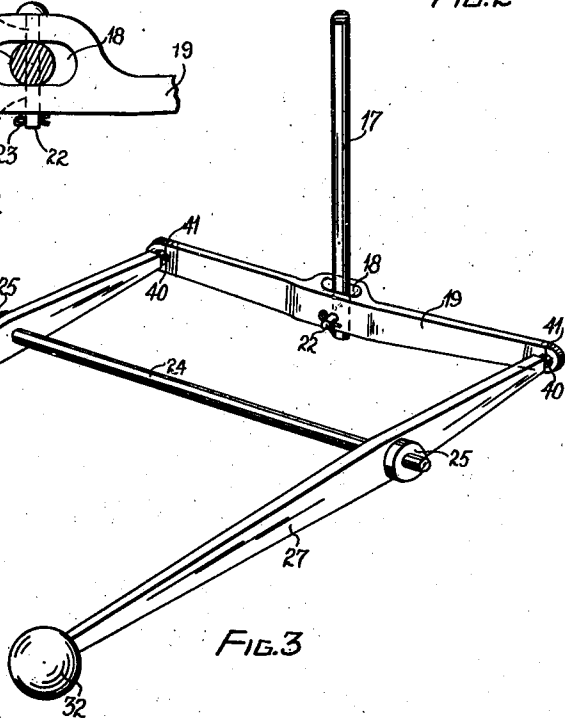


FIG. 3

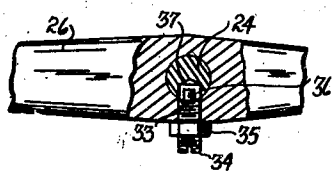


FIG. 5

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UNITED STATES PATENT OFFICE

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TWO-HAND CONTROL

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1 Claim. (Cl. 74-480)

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This invention relates to improvements in two-hand controls, particularly controls of this character adapted to promote safety in the operation of hydraulic presses.

One of the objects of the invention is the provision of controls of the character stated which shall embody as few parts as possible, and parts of such nature that the control may be built and assembled with a minimum of effort and time.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application I have illustrated in the accompanying drawing, in which

Fig. 1 is a front elevational view of a control embodying the invention, shown applied to a hydraulic press;

Fig. 2 is a side elevational view of the same;

Fig. 3 is a perspective view of the assembled parts of the control;

Fig. 4 is a fragmental plan view of the same, partly in horizontal section, and

Fig. 5 is a detail sectional view taken substantially on the line 5-5 of Fig. 4.

The invention is herein illustrated as embodied in the construction of a hydraulic press of the bench type comprising a generally C-shaped housing having an upright portion 10, a table or anvil portion 11 and an overhanging portion 12, the latter carrying a power cylinder 13 to the piston of which is attached a ram 14. Also mounted within the housing is a hydraulic valve assembly 15, the plunger of which is connected by a suitable coupling 16 with a shipper rod 17 that is capable of longitudinal movement only, being held against movements of any other nature by means of slide guides, not shown.

The lower end of shipper rod 17 extends through a slot 18 in a yoke 19. The rod 17 has a horizontal perforation therethrough which in the assembling of the device is brought into register with aligned perforations 20 and 21 in the yoke, after which a pivot pin 22 is inserted through the registering perforations and is held against accidental displacement by a cotter pin 23. By virtue of this arrangement the yoke 19 may be swung upon pivot pin 22 in a transverse vertical plane within the housing of the machine.

Disposed forwardly of the yoke 19 there is a transverse shaft or rod 24 supported at its ends in the housing and centered by means of collars 25 pinned to the shaft in abutting relation with the inner surface of the walls of the housing. Two identical levers 26 and 27 are loosely mounted on shaft 24, providing work arms of equal

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length to the rear of that shaft and power arms extending forwardly therefrom and projecting through slots 28 and 29 in the front wall of the housing. The front ends of the levers may be provided with projections 30 of round cross-section which are threaded to receive knobs 31 and 32 for convenience in manipulation.

In the under side of each of the levers 26 and 27 there is a drilled hole 33 which is threaded to receive a dog-point set-screw 34 which is held in adjusted position by a lock nut 35. The reduced end 36 of this dog-point screw extends into a smooth hole 37 formed in the shaft 24. By this means the levers 26 and 27 are permitted considerable freedom of oscillation upon the shaft 24 independently of each other, but their position longitudinally of the shaft is controlled to the necessary extent. However, a slight movement lengthwise of the shaft is permitted.

The rear ends of the levers have smooth extensions 40, circular in section, which project through horizontal openings 41 at the ends of the yoke 19. The clearance between each extension 40 and the middle of the corresponding opening 41 is very small, but the opening flares outwardly from the middle both toward the front and toward the rear. This construction provides not merely a universal joint, but one in which there is bodily movement of the extension through the opening when the lever swings in its plane of movement, either because force is applied to its power arm by the operator or because force is applied to its work arm by the swinging of the yoke 19 on its pivot due to the application of force by the operator to the power arm of the other lever.

Obviously, when the power arms of both of the levers 26 and 27 are depressed simultaneously to the same extent, the work arms of the levers swing upwardly, raising the yoke 19 bodily without tilting it on its pivot pin 22, and thus raising the shipper rod to operate a control for the valve 15. In this movement the extensions 40 of the two levers move arcuately while the yoke ends move vertically. The distance from the shaft 24 to the yoke 19 is therefore increased somewhat and the extensions 40 are retracted slightly to compensate for the arcuate movement.

Should the operator depress one lever only, for example the lever 27, the yoke 19 would swing on its pivot 22, depressing the work arm of lever 26 an amount equal to the upward movement of the work arm of the lever 27. The pivot 22 is a floating pivot, but the parts are so designed that greater effort is required to raise shipper rod

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17 and its associated parts than is required to swing yoke 19 and the lever 26, so that the actuation of a single lever has no effect upon the shipper rod. Because of the loose joints at the ends of the yoke, any tendency to cock the yoke 19 about a transverse axis or to swing the lower end of rod 17 in a forward or backward direction is easily counteracted by the guides in which the shipper rod slides. Quiet and efficient operation results.

While in the foregoing description I have necessarily gone somewhat into detail in order to explain fully the particular embodiments of the invention herein illustrated, I desire it to be understood that such detail disclosures are not to be construed as amounting to limitations except as they may be included in the appended claim:

Having thus described my invention, I claim:

In mechanism of the character described, two normally horizontal levers mounted to turn about a common horizontal axis for rocking movement in spaced vertical planes, a shipper rod disposed for longitudinal movement in a vertical direction, a yoke disposed at right angles to said planes, said levers having work arms of equal length with cylindrical extensions at the ends thereof, said yoke having holes therethrough aligned with said extensions in the normal positions of the levers,

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said holes being flared outwardly toward the front and rear of the yoke to provide sliding universal joints adapted to compensate for the arcuate travel of the work arms, and a horizontal transverse pivot carried by said yoke midway of its length upon which the lower end of said shipper rod is mounted, whereby operation of one only of said levers turns said yoke member upon said pivot and shifts the other lever in the opposite direction, while operation of both levers in the same direction raises said shipper rod.

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