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STROKE LIMIT MEANS FOR HAND PRESSES

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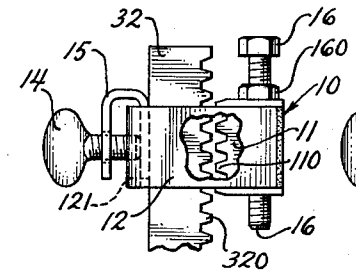


Fig. 2

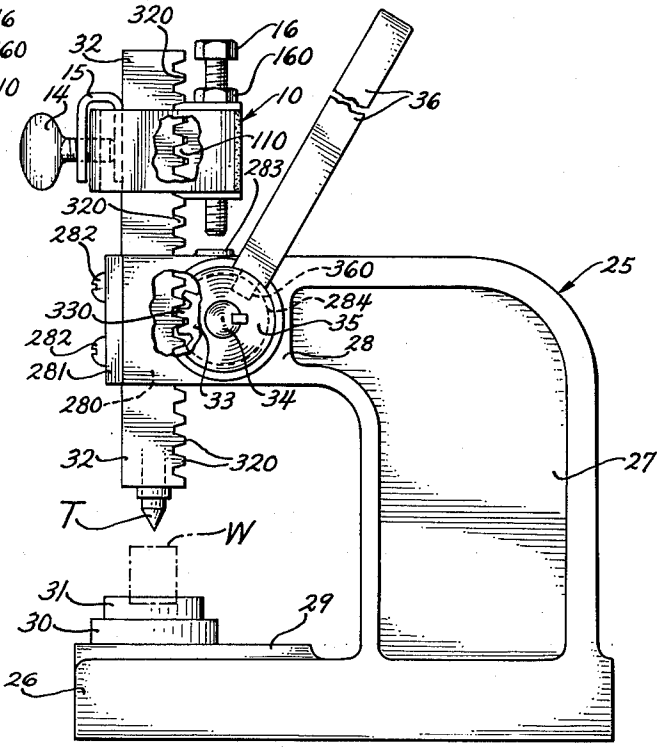


Fig. 1

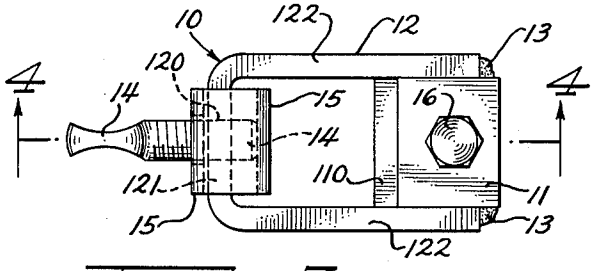


Fig. 3

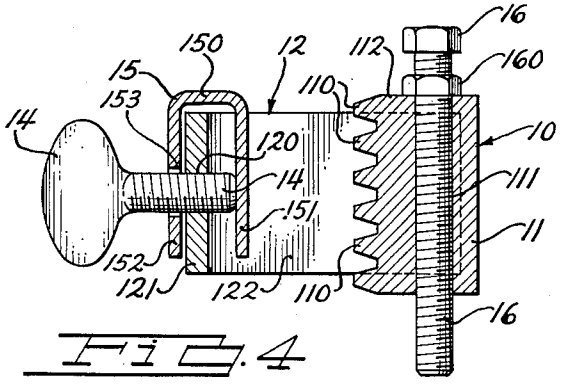


Fig. 4

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STROKE LIMIT MEANS FOR HAND PRESSES

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This invention relates to stroke limit means for hand presses such as general purpose arbor presses and the like employing a rack type ram moved by a lever operated pinion constantly in mesh with said ram.

The primary object of the invention is to provide simple, effective means for limiting the stroke of a hand press of the type having a lever operated pinion meshed with a rack type ram wherein the stroke limit means is meshed selectively along the rack type ram for coarse adjustment and incorporated fine adjustment means located to act against the fixed head of the hand press whereby coarse and fine adjustment of the downward limit of the stroke of the ram may be readily accomplished, thus making a hand operated bench type rack and pinion arbor press versatile for rapid change over to accommodate different types and sizes of work to have an operation performed thereon.

Other objects of the invention will become apparent by reference to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a side elevational view of a hand arbor press employing a stroke limit means of the invention on the rack type ram of said press.

FIG. 2 is a side elevational view of a stroke limit means of the invention telescoped over but not clamped into engagement with the rack type ram.

FIG. 3 is an enlarged top plan view of the stroke limit means of the invention.

FIG. 4 is an enlarged longitudinal sectional view of the stroke limit means of the invention taken on the line 4—4 of FIG. 3.

Referring now to the drawing wherein like reference characters refer to like and corresponding parts throughout the several views, the illustrative embodiment of a stroke limit means 10 of the invention is disclosed in connection with a hand press 25 of the rack and pinion type, such presses often being called "arbor presses."

A hand or arbor press 25 with which the invention may be employed advantageously generally consists of a base 26, a stanchion 27 and an operating head 28, all preferably integrally cast with a suitable work support pad 29 on the said base 26. Work anvil discs 30 and 31 or other means may be employed to hold or gage work W at the desired location under the vertically disposed ram 32.

The ram 32 of the particular hand press 25 with which the invention is illustrated is rectangular in shape and telescopes through a U-shaped slot 280 in the operating head 28 which is closed at its front end by a cover plate 281 and studs 282. This forms a rectangular way through which the ram slides. The rear face of the ram 32 is formed into a rack having transverse teeth 320 therein. A pinion 33 having teeth 330 which engage and mesh with the teeth 320 of the rack 32 is keyed onto a mounting shaft 34 extending transversely through the operating head 28. The said pinion 33 is turnably mounted in a bore 284 in the operating head 28. The said mounting shaft 34 extends laterally outwardly from the near side of the operating head 28 as viewed in FIG. 1, and has keyed thereon a disc 35 into which the inner end 360 of the operating lever 36 is fixed. By arcuate movement of the operating lever 36, the pinion 33 in mesh with the rack teeth 320 on the ram 32 is turned and moves the said ram 32 upwardly and downwardly.

The stroke limit means 10 of the invention hereinafter described in detail is mounted for coarse adjustment in

a selected location on the ram 32 and includes a fine adjustment to limit accurately the extent of downward movement of the ram 32.

The stroke limit means 10 consists of a short rack type anchor element 11 having horizontal teeth 110 therein which mesh with the teeth 320 of the ram 32 to provide the coarse adjustment thereof on the said ram 32. A horizontally disposed U-shaped guide bar 12 having the base 121 thereof spaced from the teeth 110 of the anchor element 11 has its arms 122 welded at 13 to the sides of the anchor element 11. The base 121 of the U-shaped guide bar 12 is bored and threaded horizontally at 120 to accommodate a preferably wing headed anchor stud 14 which is freely telescoped through an aperture 153 in the outer arm 152 of an inverted U-shaped anchor bar 15 having a base 150, an inner arm 151 and an outer arm 152 as best shown in FIG. 4. The said short rack type anchor element 11 is suitably vertically bored and threaded at 111 to accommodate a threaded stop bar 16 extending therethrough to provide for the fine adjustment thereof on the said ram 32. A lock nut 160 threaded on the threaded stop bar 16 fixes it in the vertical position to which it may be threaded through the said anchor element 11.

By reference to FIG. 2, it will be observed that the stroke limit means 10 has its wing headed anchor stud 14 threaded outwardly from the base 121 of the horizontally disposed U-shaped guide bar 12 so that the U-shaped anchor bar 15 is retracted, thus permitting the said stroke limit means 10 to be telescoped freely over the rack type ram 32 to the desired position of coarse adjustment therealong. At this position the anchor stud 14 is turned to move the U-shaped anchor bar 15 inwardly which causes the teeth 110 of the anchor element 11 of the stroke limit means 10 to mesh with opposite teeth 320 of the ram 32. This fixes the stroke limit means 10 in coarse adjustment on the ram 32 to limit the downward movement of the said ram 32 by the contact of the stop bar 16 on the upper or top surface pad 283 of the head 28 of the hand press 25. By adjusting the threaded stop bar 16 so that the bottom thereof is at the proper elevation in respect to the said ram 32 and the surface pad 283, and tightening the lock nut 160 thereon against the top 112 of the short rack type anchor element 11, the fine adjustment of the downward limit of the stroke of the ram 32 is accomplished. This permits the tool "T" mounted in the bottom of the ram 32 to be brought against the work W to the proper contact depth.

The instant invention provides a hand rack and pinion type arbor press with positive readily adjustable coarse and fine stroke limit means at a very little expense, and which will save much set-up and change-over time when using such a press for tool room work or for short run production.

Although but a single embodiment of the invention has been disclosed and described in detail herein, it is obvious that many changes may be made in the size, shape, arrangement and detail of the various elements of the invention, all without departing from the spirit and scope thereof as defined by the appended claims.

I claim:

1. In a hand press of the type including a base, a stanchion extending upwardly therefrom supporting an operating head, a work support on said base for accurately supporting work thereon, a rack type ram means disposed over said work support and reciprocable through said operating head, said rack type ram having transversely disposed teeth formed in one side thereof, and lever operated pinion means carried by said operating head engaged with said rack type ram for raising and lowering the same,

a stroke limit means consisting of a transversely toothed

rack type anchor element telescopable over said ram and meshable with said ram teeth at a selected location therealong providing a coarse adjustment of said stroke limit means on said ram,

means removably drawing said anchor element to said rack in said selected location with the teeth thereof fully meshed whereby to removably fix said anchor element in said selected location,

stop bar means carried by said anchor element adjustably fixed to contact the top of said operating head providing a fine adjustment of the stroke of said ram toward work supported on said work support.

2. In a hand press of the type including a base, a stanchion extending upwardly therefrom supporting an operating head, a work support on said base for accurately supporting work thereon, a rack type ram disposed over said work support and reciprocable through said operating head, said rack type ram having transversely disposed teeth formed in one side thereof, and lever operated pinion means carried by said operating head engaged with said rack type ram for raising and lowering the same,

a stroke limit means comprising a short rack type anchor element and a stop bar means,

said rack type anchor element being telescopable over said ram and having transverse teeth meshable with selected transverse teeth of said ram providing coarse adjustment of said stroke limit means on said ram when said anchor element teeth and said anchor teeth are in engagement,

means drawing said anchor element to said ram with the teeth thereof in solid meshed engagement with the teeth of said ram removably fixing said anchor element to said ram in its selected position,

said stop bar means being threaded through said anchor element and located to contact the top of said operating head so as to provide a fine adjustment of said stroke limit means with respect to said operating head whereby to limit the downward movement of said ram toward said work support.

3. A stroke limit means for hand presses and the like of the type including a base, a stanchion extending upwardly therefrom supporting an operating head, a work support on said base, a rack type ram having transverse gear teeth disposed over said work support and reciprocable through said operating head, and a lever operated pinion carried by said operating head engaged with said rack type ram for raising and lowering said ram comprising

a short rack type anchor element including transverse gear teeth meshable with said gear teeth of said rack type ram,

a horizontally disposed U-shaped guide bar having said anchor element fixed across the open end thereof,

a vertically disposed U-shaped anchor bar disposed over the base of said U-shaped guide bar having an aperture in the outer leg thereof,

an anchor stud telescoped through the said aperture in the outer leg of said anchor bar, threaded through the base of said U-shaped guide bar and into contact with the inner leg of said anchor bar,

the said stroke limit means being telescopable for coarse adjustment along said ram with the teeth of said anchor element and said ram disposed in spaced relationship when said anchor stud and said anchor bar is retracted,

said stroke limit means being securable in a selected position along said ram with the teeth of said anchor element and said ram tightly meshed responsive to the advancement of said anchor bar by said anchor stud against said ram whereby to accomplish coarse adjustment of the said stroke limit means on said ram,

stop bar means threaded through said rack type anchor element into contact with the operating head of said press whereby to accomplish fine adjustment of the said stroke limit means with respect to said operating head and thereby limit the downward movement of said ram,

and means for locking said stop bar means in its said fine adjusted position.

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