S. SYLVESTER.

HAND SCREW.

APPLICATION FILED SEPT. 1, 1921.

1,429,050.

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Fig. 1.

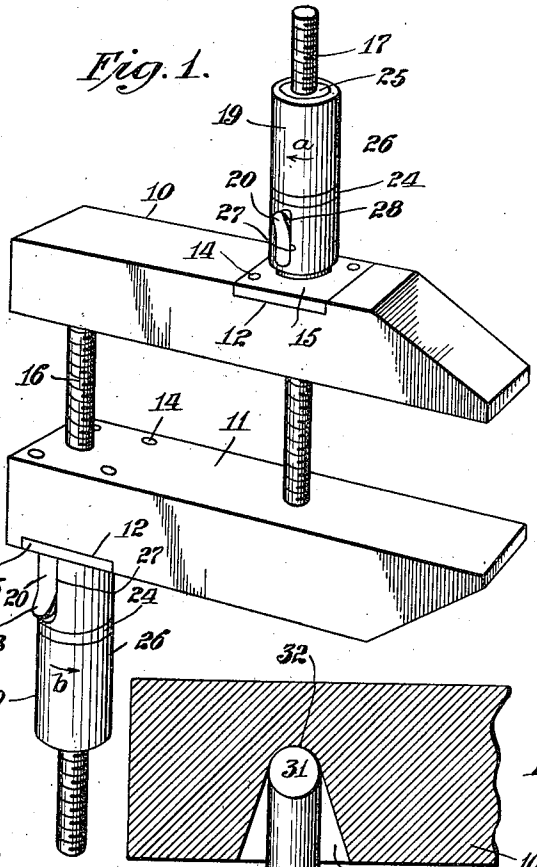


Fig. 4.

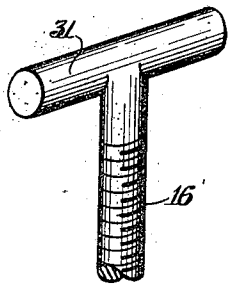


Fig. 2.

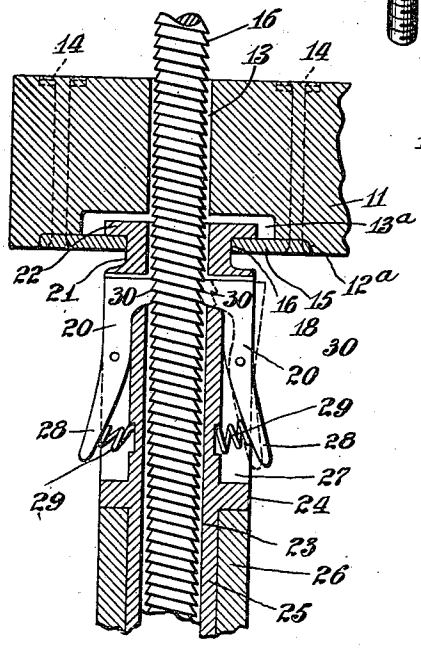
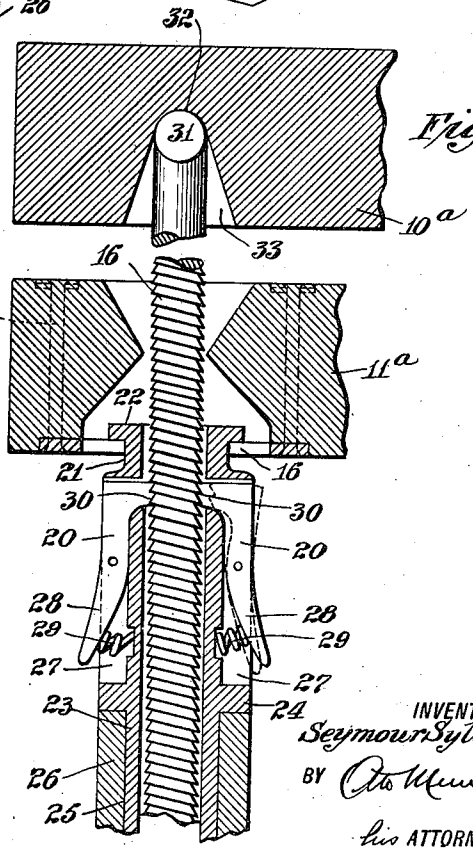


Fig. 3.



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UNITED STATES PATENT OFFICE.

SEYMOUR SYLVESTER, OF BROOKLYN, NEW YORK.

HAND SCREW.

Application filed September 1, 1921. Serial No. 497,754.

To all whom it may concern:

Be it known that I, Seymour Sylvester, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Hand Screws, of which the following is a specification.

My invention relates to improvements in the construction of hand screws in which adjustable clamping jaws may be moved freely and axially of a pair of threaded spindles to engage the opposite surfaces of an object and then to receive further adjustment about the threads of said spindles to move the jaws into closer proximity with each other.

This invention has for its primary objects, first, to simplify the construction and operation of such devices; second, to afford free or screw adjustment for a pair of clamping jaws; third, to provide means carried by the clamping jaws whereby relative adjustment of one jaw may be made independently of the other jaw; and fourth, to so construct the clamping jaws that each may be adjusted at an angle to each other or in respect to the axis of the threaded spindles extending between the two jaws.

The invention is fully described in the specification and illustratively exemplified in the accompanying drawing, wherein

Fig. 1 is a perspective view of my improved hand screw showing the clamping jaws slightly parted.

Fig. 2 is a substantially longitudinal sectional view taken through one of the handles and its adjacent parts.

Fig. 3 is a view similar to that shown in Fig. 2, except that the construction and arrangement of the clamping jaws afford angular movement of the latter.

Fig. 4 is a detail perspective view of the hinge end portion of the threaded screw or spindle used in the construction shown in Fig. 3.

Referring to the drawing, 10 and 11 denote the two clamping jaws, hereinafter referred to as the upper and lower clamping jaws respectively, said jaws being preferably constructed of hard wood or metal and having their opposed inner faces substantially straight. Each jaw is made from square stock cut to suitable length and beveled at its forward end from a point slightly above the lower or inner edge to the outer face of the jaw.

In Fig. 1 the upper jaw 10 is provided with a countersunk portion 12 extending transversely of the length of the jaw and located slightly in the rear of the bevel at the nose of the jaw. This countersunk portion is shallow and leads to a second laterally disposed depression 13ª shown in Fig. 2, and which is circular in shape and substantially smaller in diameter than the other depression or countersunk portion 12. From the inner wall of the second depression and extending axially thereof through the body of the jaw 10 to the opposite face is a round bore 13. Mounted in the countersunk portion 12 and held in position by rivets 14 which extend through the body of the jaw itself to a plate 15 having an opening therein adapted to register with the bore 13. A similar construction, as described above, is provided in the outer face of the lower clamping jaw 11, except that the plate 15 is mounted in a countersunk portion 12ª located at the rearward end of the jaw, said plate being held in position by four rivets instead of two, as shown in the jaw 10. This mechanical expedient has been resorted to because this portion of the jaw 11 is called upon to withstand the entire pulling strain caused by the clamping action of the device.

In carrying my invention into practice I provide the jaws 10 and 11 with threaded spindles or screws 16 and 17 respectively, extending at substantially right angles to the inner faces of the jaws and adapted to register with the bores 13 when the two jaws are placed one above the other. It will be noted, with reference to Fig. 2, that these spindles 16 and 17 are free to be moved axially of the bores 13, so at to permit relative adjustment of the two jaws toward and away from each other. The threads of the spindles 17 and 16 are right and left hand threads respectively, and receive operating handles 19 at their outer free ends which project beyond the openings 16 in the plates 15 and which are provided with oppositely disposed pivoted detents 20 adapted to engage the threads of the spindles. The inner ends of the handles 19 are provided with annular grooves 21 in which the walls of the openings 16 are adapted to seat and which prevent axial displacement of the handles. The outer flange 22 of the groove 21 is confined to the second depression 13ª below the countersunk portion 12 and is capable of free rotary movement therein

when the handle is turned about the spindle.

The handles 19 for both spindles 16 and 17 are substantially alike and a detail description of one these members will suffice.

The body portion of the handle, as shown in Fig. 2, comprises a cylindrical metal tube 23 having an annular flange 24 extending outwardly about midway of its length and which terminates at one end in the groove 21 and flange 22 and at the opposite end in a reduced portion 25 adapted to receive a wooden grip 26. The detents 20 are pivotally mounted in longitudinal grooves or slots 27 located at diametrically opposite sides of the tube 23, said detents being provided with offset outer ends 28 which are normally held away from the base of the slots 27 by means of coiled springs 29 yieldably engaging the under sides of the offset portions 28 at one of their ends and the other of which ends rest in seats provided in the bottom of the slots 27. In this position the offset portion 28 of the detents 20 will project above the periphery of the tube 23 and the opposite ends having the teeth 30 will be engaged against the threads of the spindles 16 and 17. It will be noted that the detents 20 adapted to engage the threads of spindle 17 are reversed so that the offset portion 28 thereof will be uppermost and the engaging teeth 30 will be below the pivot; this construction has been made necessary due to the right hand threads of this spindle. The two handles 19 although similar in construction produce a very different operating effect, as hereinafter described.

Referring now to Figs. 3 and 4 which show a slightly modified form of mounting the spindles so as to permit angular movement of one jaw relative to the other as well as axial movement, I provide the attached end of each spindle 16 and 17 with a cross head 31 adapted to pivotally bear in a laterally disposed opening 32 extending transversely of the body of the jaws 10^a and 11^a. In order to permit the spindles 16 and 17 to rock about the cross heads 31 as pivots the lower portions of the openings 32 are V shaped as indicated at 33. Instead of the bore 13 of the preceding construction, shown in Fig. 2, the walls, surrounding the spindles 16 and 17, at their opposite ends converge toward the center to a point substantially in the center of the body of the jaw and are then flared outwardly again to the under surface of the jaw. It will be noted that with the jaws constructed as in Fig. 3, and the spindles pivotally mounted as described in the foregoing paragraph, the clamping members may be adjusted to any angle. This is particularly desirable where irregular surfaces are to be engaged and clamped, there being no need to first square such surfaces in order to provide gripping surface for the jaws. By proper manipulation one jaw may be made to overlap the other while they are both held in substantially parallel relation. Such an adjustment is very desirable where one of the jaws is compelled to engage a narrow surface while the other jaw may be free to utilize a much larger surface against which to engage.

The operation of the hand screw is as follows:— The work about to be clamped having been made ready to receive the hand screw, the handles of the latter are held one in each hand with the thumbs overlying the offset portions of the detents 20 and with the beveled ends of the jaws 10 and 11 projecting outwardly away from the operator. The handles may then be moved axially of the spindles 16 and 17 until the inner faces of the jaws have been separated far enough to be placed over the opposite surfaces of the work. In doing this it is first necessary to depress the offset portion of the detent 20 to release the handle 19 which operates on the spindle 17 having the right hand threads. The jaws 10 and 11 are then moved toward each other and against the edges of the work, this movement being effected by releasing the detent 20 which engages the threads of the spindle 16 and pushing inwardly on the handle 19 mounted on the spindle 17. The inner faces of the jaws 10 and 11 should then be in contact with the opposite surfaces of the work and in order to tighten the jaws further against the work all that is necessary is to turn the handles in opposite directions indicated by the arrows *a* and *b* in Fig. 1. This last operation will cause the handles 19 and jaws 10 and 11 to move axially of the spindles 17 and 16 respectively, and toward each other. As above stated, the action of the handles 19 and their detents 20 in conjunction with the two screws 16 and 17 is substantially different, because when the handle 19 is turned about the spindle 17 to tighten the jaw 10 there will be a pulling action of the spindle to draw the jaw 11 towards the jaw 10, while, when the other handle is turned about the spindle 16 there will be a tendency to push the jaw 11 inwardly towards the other jaw 10. Hence, the four rivets to hold the plate 15 in its proper position in the rear portion of the jaw 11 so that the strain exerted on the plate 15 will be equalized in the body of the jaw itself.

To release the tightened jaws 10 and 11 the offset portions of the detents 20 are depressed and the latter disengaged from the threads of the spindles 16 and 17, whereupon the handles 19 are free to move axially of the spindles to separate the jaws one from the other.

I claim:—

1. In a tool of the character described,

the combination of adjustably mounted clamping jaws, a spindle fixed to each jaw and adapted to move freely in an opening in the other jaw, and means carried by said jaws and capable of free axial and rotary movement and screw adjustment about said spindles, whereby the clamping jaws may first be moved unobstructedly toward each other and then receive further adjustment about said spindles, to be forced into closer proximity with each other.

2. In a hand screw, the combination with movable clamping jaws, of relatively moveable spindles fixed to said jaws, and adjustable grips mounted in said jaws and capable of relative rotary movement therein and both rotary and axial movement about said spindles, each of said grips comprising a tubular member provided with spring actuated detents adapted to normally engage the threads of its spindle, said detents being rocked to release the grips to move said jaws unobstructedly toward or away from each other and then permitting said detents to return to their normal positions to further adjust said grips and jaws about the threads of said spindles.

3. In a hand screw, the combination with upper and lower relatively movable clamping jaws, of a threaded spindle fixed to each jaw and adjustable in an opening in the opposite jaw, handles capable of rotary movement in relation to said jaws and adapted to move axially and to rotate about said spindles, and pivoted thread engaging members mounted in said handles and adapted to normally yieldably engage the threads of said spindles, whereby said jaws may be moved freely a predetermined distance toward each other and then forced to move further in the same direction by rotary movement of said handles.

4. In a hand screw clamp, the combination with relatively movable jaws, screw spindles fixed to opposite jaws, the free ends of said spindles having axial movement through openings in the opposite jaws, handle members rotatably mounted in each of said jaws and adapted to move axially of said spindles with the jaws, and means pivotally mounted in said handles and yieldably held in the path of possible movement of the threads of said spindles, whereby said means may be operated to permit free axial movement of the spindles through the openings in said jaws to move the latter relatively of each other and then released to engage with the threads of the spindles to further adjust the jaws by rotary movement of the handles.

In testimony whereof I have affixed my signature.

SEYMOUR SYLVESTER.