H. MÜLLER.

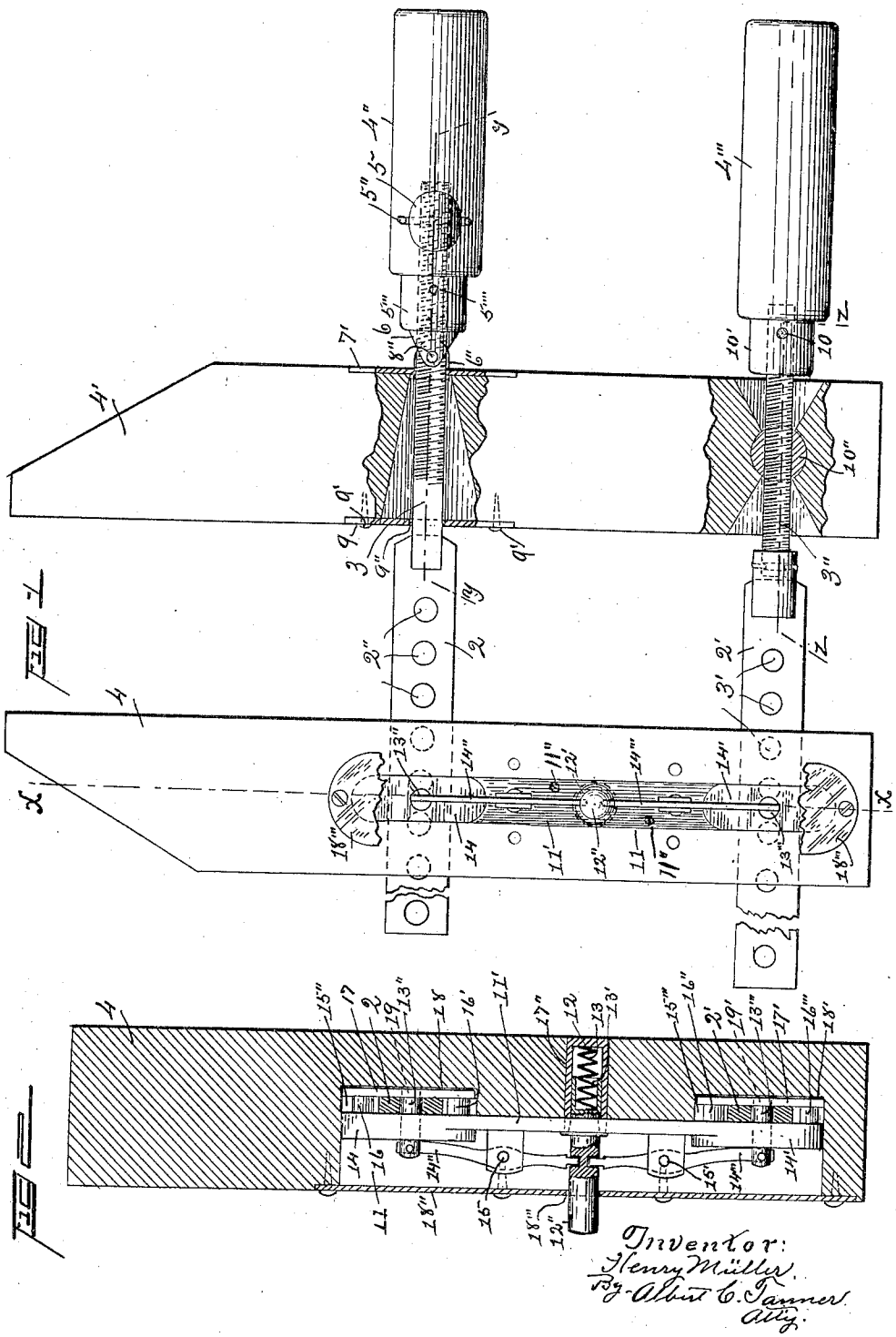
JOINER'S CLAMP.

APPLICATION FILED NOV. 8, 1919.

1,346,236.

Patented July 13, 1920.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG 1

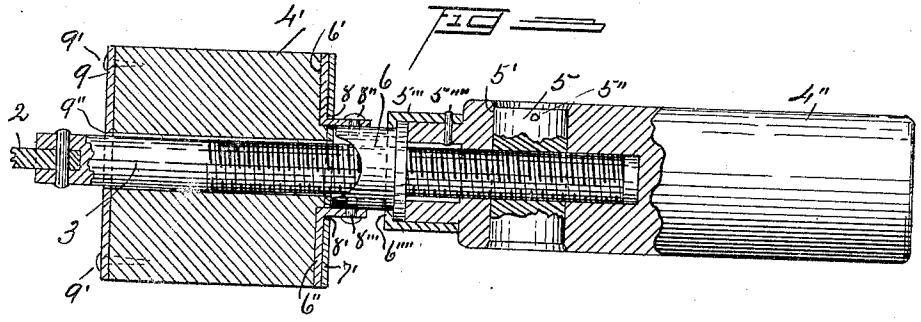


FIG 4

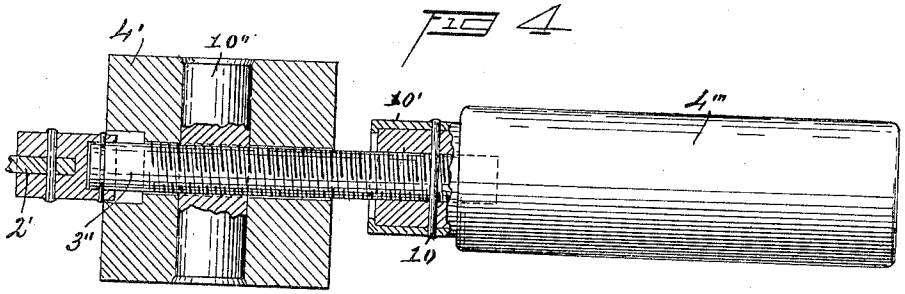
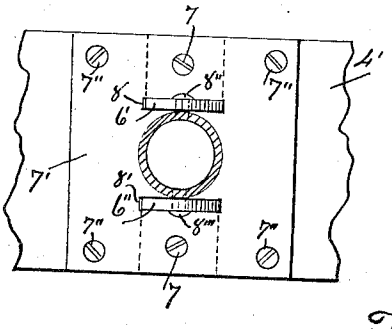


FIG 5



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UNITED STATES PATENT OFFICE.

HENRY MÜLLER, OF WATERBURY, CONNECTICUT.

JOINER'S CLAMP.

1,346,236. Specification of Letters Patent. Patented July 13, 1920.

Application filed November 8, 1919. Serial No. 336,743.

To all whom it may concern:

Be it known that I, HENRY MÜLLER, a citizen of the United States, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Joiners' Clamps, which improvements are fully set forth in the following specification.

This invention relates to improvements in devices of that class affording a pair of operating jaws and available for temporarily clamping together work or parts to be treated or operated upon, more particularly by joiners and other wood-workers, such devices being commonly known as joiners' clamps.

The object of this invention is to provide a clamp of the character above indicated, which shall be simple and inexpensive as regards its construction; durable, efficient and reliable in practical service; convenient in its application to practical purposes, and which shall possess certain well-defined advantages over prior analogous constructions.

The invention consists in certain combinations, details and parts whereby, together with the novel disposition and relative arrangement of said parts, the attainment of the foregoing object is rendered practicable, all of which will be hereinafter more specifically referred to and set forth in the claims hereto appended.

The invention is clearly illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of a joiner's clamp embodying my said improvements, the cover being omitted from the stop-mechanism recess with which the shiftable jaw is provided, and portions of the opposite, relatively fixed jaw being broken away to better disclose certain minor details of the construction.

Fig. 2 is a transverse section thereof, as along the dotted line *x*—*x* of Fig. 1, the cover mentioned in the description of Fig. 1 being retained.

Fig. 3 is an enlarged detail sectional view, the section being taken along the dotted line *y*—*y* of Fig. 1.

Fig. 4 is a view similar to Fig. 3, the section being taken along the dotted line *z*—*z* of Fig. 1.

Fig. 5 is a view showing a fragment of the relatively fixed jaw so turned from the position it is shown as occupying in Fig. 1 as to disclose in elevation the coöperating elements through the medium of which said jaw is hingedly conjoined with one of the operating-bars of the device.

Having reference to the accompanying drawings, wherein similar reference-numerals denote like parts through out the several views, I, in carrying out my present invention, provide primary and secondary operating-bars 2, 2′, respectively, the same being normally disposed in spaced parallelism each relatively to the other, preferably formed, respectively, from flat material of substantial thickness, and provided longitudinally therealong, the one with a series of stop-receiving clearances 2″ and having firmly conjoined therewith a suitable shank 3, and the other with a like series of stop-receiving clearances 3′, conforming, by preference, to those denoted by 2″, and having freely conjoined therewith a suitable shank 3″, similar, in the main, to the shank 3.

I further provide opposed jaws 4, 4′, which are jointly intersected and freely pierced by the operating-bars 2, 2′, and so that the jaw 4 may be freely shifted, when liberated for such action, to and fro along said operating-bars jointly, while the jaw 4′ is at all times restrained against such free shifting action, though being at all times controlledly adjustable to and fro jointly along the shanks of said operating-bars, the jaw 4′ being herein treated, accordingly, as bearing at all times a fixed relation relatively to the jaw 4, particularly under any operating-stress brought to bear on said jaws jointly, in practice.

As hand-operative elements whereby the jaw 4′ may be controlledly adjusted, either simultaneously or alternately to and fro along the shanks 3, 3″, and the opposed jaws aforenamed may be otherwise relatively manipulated in practice, I provide a hand-piece 4″ for coöperation with the shank 3 and a similar hand-piece 4‴ for cooperation with the shank 3″, all as will be hereinafter more fully explained.

To the end that the hand-piece 4″ shall be rotatable independently of the shank 3 with which it coöperates, said hand-piece is fitted with a nut 5, here shown as being elongated, traversing the hand-piece diametrically, fixed relatively thereto as through the medium of a retaining-pin 5″, and, further,

as being pierced by, and having a threaded engagement with, the shank aforenamed, the latter, as hereinbefore noted, freely piercing primarily, from the operating face thereof, the jaw 4′ and, to facilitate the foregoing disposition of the parts now under consideration, projecting duly outwardly therefrom and duly and axially into said hand-piece at the advance end thereof.

The hand-piece 4″ is fitted with a cylindrical ferrule 5‴, at its advance end, and which may be fixedly retained in place by means of any common and well-known fastening element, as the rivet 5⁗, said ferrule being provided with an inturned flange 6⁗, at its advance end.

There is let telescopically into the ferrule 5‴ at its advance end a cylindrical link 6, axially by way of which conjunctively with said ferrule, the shank 3 enters the hand-piece aforenamed for its threaded engagement with the nut 5, said link having a swiveled connection with said ferrule, whereby said hand-piece, accompanied by the ferrule, may be oppositely rotated independently of the link, the latter being hingedly connected at its advance end to the jaw 4″, as through the medium of the angular bearing-pieces 6′, 6″, let opposedly into the adjacent, outer face of said jaw and there held through the medium of any suitable fasteners, as the screws 7.

Where deemed advisable a retaining-plate 7′ may be availed in addition to the screws 7, the same being duly secured, as by means of screws 7″, to the jaw 4″ at its outer face, with the major portion of each of the bearing-pieces aforenamed between such retaining-plate and said jaw, substantially as shown; while the minor elements of the bearing-pieces thus opposed and secured, project outwardly through and somewhat beyond said retaining-plate, as by way of suitably spaced openings 8, 8′, formed therein, and between and to which minor elements is hingedly conjoined, through the medium of suitable opposite pintles or trunnions 8″, 8‴, the link 6, whereby, through proper manipulation of the hand-piece 4″, the operating-bar 2 may be rocked to and fro in the general plane normally occupied by the respective jaws of the device, and to permit which rocking action on the part of said operating-bar, due clearance is provided within the jaw 4″, at the point of intersection thereof by the shank 3, all as clearly shown in Fig. 1 of the drawing.

Again, where found needful or desirable, a finishing-plate 9 may be secured, as by means of screws 9′, to the jaw 4′ at its inner or operating face and at the point of intersection of said jaw by the shank 3, the latter piercing said plate by way of a suitable opening 9″ formed therein, and said opening being duly enlarged to permit the to and fro rocking action aforenamed, on the part of the operating-bar 2, as will be readily understood.

To the end that the shank 3″ shall act as a unit with the hand-piece 4‴, these parts are secured together in any common and well-known way, though preferably through the medium of a fastening-pin 10, said shank telescopically entering the hand-piece at its advance end; and to facilitate the use of the pin 10, the hand-piece 4‴ may be provided with a ferrule 10′, similar to 5‴, whereupon such pin extends diametrically through such ferrule and that portion of the shank 3 embraced thereby, as clearly indicated in Fig. 1.

10″ denotes an elongated nut, similar to 5, the same extending loosely through the jaw 4′, at right angles to the shank 3″ and the line along which the latter intersects said jaw, said shank piercing and having a threaded engagement with said nut, and the latter being loosely disposed to the end that the operating-bar 2′ may be caused to undergo a rocking action to and fro, through proper manipulation of the hand-pieces 4″, 4‴ or either thereof, within the general plane of the jaws of the device, and generally in unison with the operating-bar 2, due clearance to this end being provided within the jaw 4′, at the point of intersection thereof by the shank 3″, as clearly shown in Fig. 1; and the respective operating parts of the device, including the jaws 4, 4′, being duly assembled for service.

It will be noted in this connection that while the operating-bars of the device may be rocked to and fro generally in unison, as hereinbefore explained, said operating-bars have variant axes of movement, considered relatively to the coöperating jaws of the device, and particularly the jaw 4′.

The shank 3″ has a swiveled connection at its advance end with the operating-bar 2′, said shank being duly threaded for coöperation, accordingly, with the nut 10″, and being of sufficient length between its point of connection with the operating-bar 2′ and the hand-piece 4‴ to permit substantial relative adjustment, to and fro therealong, of the adjacent portion of the jaw 4′, upon the hand-piece 4‴ being duly manipulated.

The foregoing also applies, in the main, to the shank 3 and parts coöperating therewith for a like adjustment of the adjacent portion of the jaw 4′, to and fro along said shank.

The shiftable jaw 4 is more or less loosely mounted on the operating-bars 2, 2′, and hence is shiftable, by a sliding movement, to and fro along said operating-bars,—in one direction to bring the jaw 4 relatively nearer the jaw 4′, preparatory to the impartation of a clamping effect on any article or object which may be inserted between the respective jaws of the device, at the nose

portions thereof, and as in common practice, and in the opposite direction to remove the jaw 4 relatively away from the jaw 4′, as for the purpose of releasing any article or object held between the respective jaws of the device, at the nose portions thereof.

While any appropriate means may be availed of for releasably fastening the jaw 4 at its variant positions of adjustment along the operating-bars of the device, I purpose providing, in this connection, the jaw 4 with an elongated recess 11, at one side thereof, and wherein is disposed a duplex stop-mechanism which will now be described.

11′ is an elongated base, fitting within the recess 11 and there held by means of any suitable fasteners, as the screws 11″, said base being fitted with a medial, elongated socket 12, closed at its end most distant from the base 11′, and normally open at its opposite end, where the same is reduced diametrically, lies within a suitable opening 12′, formed in the base aforenamed, and is here shown as being swaged over along its free edge whereby the socket is fastened to said base.

12″ is a push-pin working endwise within the socket 12 against the tendency of a spiral spring 13, the latter positioned within the socket 12, with its upper portion preferably occupying a recess 13′ formed lengthwise in the push-pin aforenamed, at the adjacent, inner end thereof, said spring tending at all times to elastically hold such push-pin to the limit of its outward play.

13″, 13‴ denote, respectively, opposite stop-pintles, working endwise in suitable heads 14, 14′, respectively, at the opposite ends of the base 11′, and normally projecting, each through and well beyond its co-operating head.

14″, 14‴ denote, respectively, opposite, intermediate levers, pivotally conjoined, the one at one end thereof with the stop-pintle 13″, having its fulcrum at 15, and somewhat loosely engaging at its opposite end, the push-pin 12″, at the adjacent side thereof, and the other with the stop-pintle 13‴, having its fulcrum at 15′, and somewhat loosely engaging at its opposite end the push-pin 12″, at its adjacent or opposite side thereof, the parts coöperating with the push-pin 12″, at the opposite sides thereof, being counterparts in all essential details of form and construction.

15″, 15‴ denote clearances, beneath and at the opposite ends of the base 11′, the same being formed, in this instance, by firmly fixing, as through the medium of suitable spacing rivets 16, 16′, 16″, 16‴, respectively, appropriate, minor yokes 17, 17′, disposed, respectively, in suitable spaced parallel relation to the base aforenamed, substantially as shown, the recess 11 having a suitable medial pocket 17″, and suitable, opposite end-pockets 18, 18′, for the accommodation of the socket 12 and opposite clearance-forming elements aforenamed, when the stop-mechanism is in position for service within the recess aforenamed, any appropriate closure-plate, as 18″ being employed for spanning and covering said recess, and being fitted with a suitable, medial opening 18‴ outwardly through and duly beyond which projects at all times the free end-portion of push-pin 12″, undue outward play on the part of which is limited by the action of the parts coöperating therewith.

The yokes 17, 17′, are best provided, the one with an opening 19, in registry with and for the reception of the free end-portion of the adjacent stop-pintle 13″, and the other with a like opening 19′ for corresponding coöperation with the stop-pintle 13‴.

The parts being assembled, operating-bars 2, 2′, occupy, respectively, the clearances 15″, 15‴, with the stop-pintles aforenamed lockingly engaging the operating-bars 2, 2′, in this instance by entering, one thereof that one of the clearance-openings 2″ in registry with which such stop-pintle may be brought under adjustment of the jaw 4 relatively along the operating-bars of the device, and the other, that one of the clearance-openings 3′ in registry with which such last-referred to stop-pintle may be brought under such adjustment of the jaw 4, all under the normal elastic action of the spring 13, said jaw being thus temporarily locked in place relatively to the operating-bars of the device, and say, with an object to be clamped positioned between the jaws thereof, the jaw 4′ being duly retracted along the respective shanks 3, 3″. Now, an initial clamping effect may be had on such object by causing the nose portion of the jaw 4′ to advance along the shank 3 in the direction of the now temporarily locked jaw 4, by duly turning the handpiece 4″, the space intervening between the nose portions of the opposing jaws being thereby contracted, while a further and more pronounced clamping effect may be now had on said object by causing the heel portion of the jaw 4′ to recede along the shank 3″, away from the corresponding heel portion of the jaw 4, by duly turning the hand-piece 4‴, the space intervening between such heel portions of the opposing jaws being thereby measurably increased, while space intervening between the nose portions of said jaws is thereby still further relatively decreased, with a proportionate increase in the clamping effect applied to the object now firmly held between the jaws, as will be readily understood.

Reversely turning the hand-pieces 4″, 4‴, or either of them, will result in the release, partially or wholly as the case may

be, and as may be required by the user, of the object clamped between the jaws of the device. Whereupon, it being desired to release the jaw 4 for readjustment to a new position along the operating-bars, the user merely urges by finger-pressure the push-pin 12″ endwise inwardly against the elastic resistance afforded by the spring 13, thereby, through the medium of the intermediate levers 14″, 14‴, retracting the opposite stop-pintles 13″, 13‴ from their locking engagement with the operating-bars of the device and accordingly freeing said jaw from its locked relation to said operating-bars, thereby permitting the same to be shifted, as the user may desire in either direction along such operating-bars, at which new position the jaw becomes automatically again locked in its relation to said operating-bars, the user merely withdrawing his finger-pressure from the push-pin aforenamed.

Whereupon, for further clamping purposes, the hand-pieces 4″, 4‴ are again manipulated as hereinbefore explained, for actuating the jaw 4′.

Due clearance being provided at all lines of intersection of the respective jaws of the device by the operating-bars thereof, there is permitted an endwise shifting action of the jaws, each substantially in parallelism with the other and under which the operating-bars are caused to intersect said jaws in parallelism though jointly at an inclination thereto, and being important as it insures for the device marked flexibility with a like resultant increase in the facility with which my present improved clamp may be applied to practical purposes.

The operation of the clamp will be apparent from the foregoing description thereof; and it will be seen that modifications thereof, particularly as regards the specific character of the stop-mechanism made use of, including various parts and details of the general construction, may be resorted to without departing materially from the spirit and principle of my invention as herein set forth and as coming within the scope of the claims hereto appended.

Having thus described my invention, I claim:

1. A joiner's clamp comprising a pair of operating-bars arranged in spaced parallel relation, one thereof having a threaded shank firmly conjoined therewith; a pair of clamping jaws mounted on said operating-bars, one for sliding adjustments therealong, and the other having a link hinged thereto at its outer face, and being freely intersected, conjunctively with such link, by the shank aforenamed; a hand-piece swiveled to said link and affording a fixed nut having a threaded engagement with said shank, whereby direct and reverse adjustments of the last-named jaw may be effected; and means for temporarily locking the first-named jaw to said operating-bars, at variant positions therealong.

2. A joiner's clamp comprising a pair of operating-bars arranged in spaced parallel relation, one having a threaded shank fixedly conjoined therewith and the other having a similar shank swiveled thereto; a pair of clamping jaws mounted on said operating-bars, one for sliding adjustments therealong and the other affording a rocking nut having a threaded engagement with the swiveled shank, having a link hinged thereto at its outer face, and being intersected, conjunctively with said link, by the opposite shank aforenamed; a hand-piece fastened to said swiveled shank, at the outer end thereof, and whereby the heel-portion of the last-named jaw may be directly and reversely actuated; an additional hand-piece affording a fixed nut having a threaded engagement with said opposite shank, and whereby the nose-portion of the jaw last-named may be directly and reversely actuated, said additional hand-piece being swiveled to said link to this end; and means for temporarily locking the first-named jaw to said operating-bars, at variant positions therealong, due clearance being provided at all lines of intersection of the respective clamping jaws by the respective operating-bars to insure general flexibility for the device as a whole.

HENRY MÜLLER.