April 5, 1927. H. G. BUTT 1,623,045

PIPE VISE

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Fig. 1.

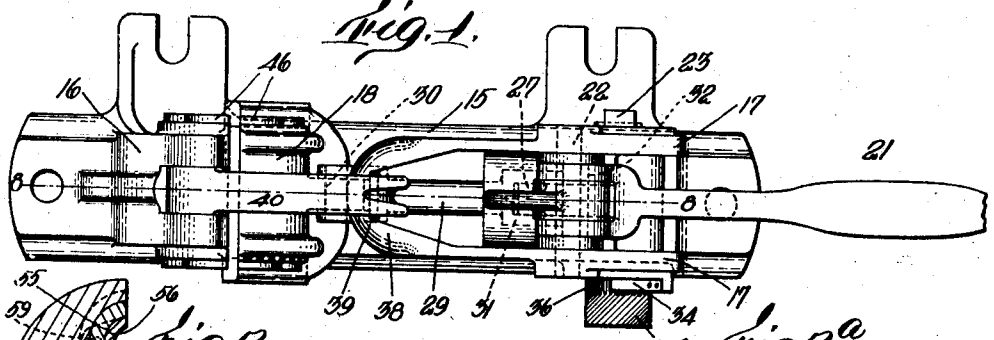


Fig. 7.

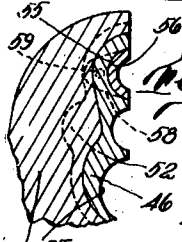


Fig. 7a

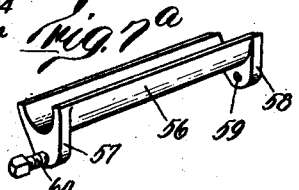


Fig. 2.

Fig. 3.

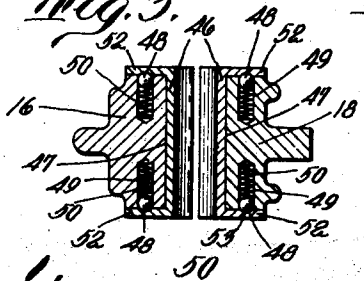


Fig. 4.

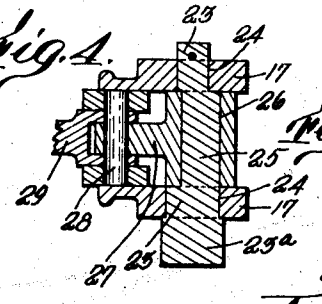


Fig. 6.

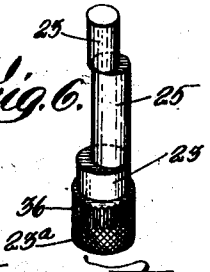
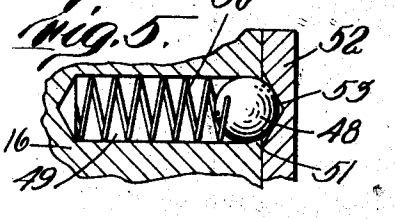


Fig. 5.



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1,623,045

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Fig. 13.

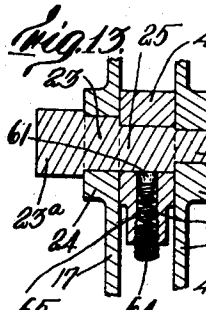


Fig. 8.

Fig. 10.

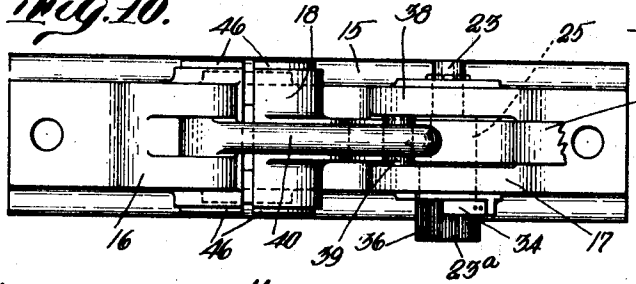


Fig. 11.

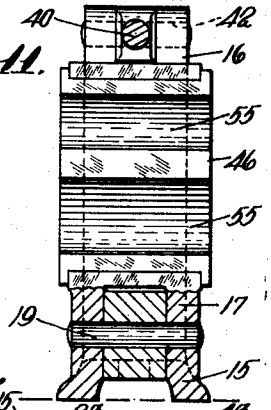


Fig. 9.

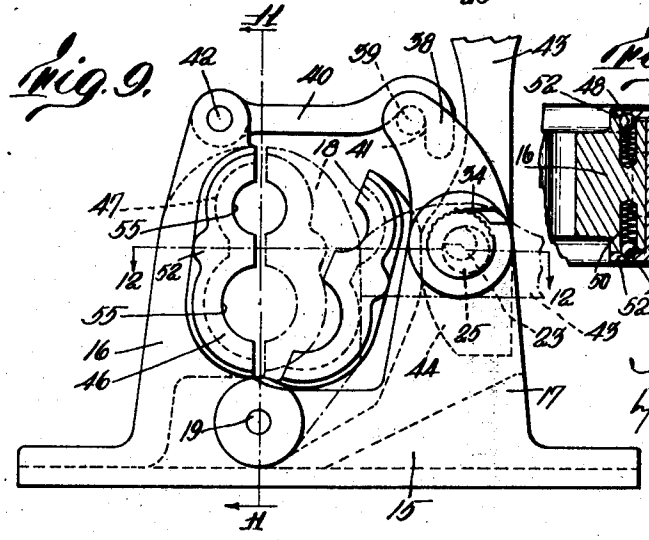
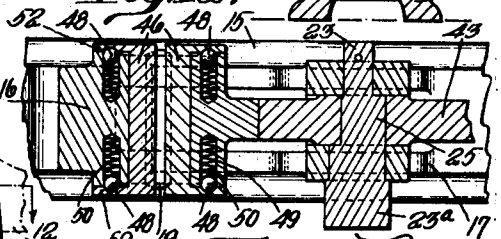


Fig. 12.



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Patented Apr. 5, 1927. 1,623,045

UNITED STATES PATENT OFFICE.

HERBERT G. BUTT, OF WINTHROP, MASSACHUSETTS.

PIPE VISE.

Application filed September 16, 1925. Serial No. 56,630.

The object of this invention is to provide an improved vise adapted to securely hold bodies, of cylindrical or other form, of various diameters or sizes.

The invention is embodied in the improvements hereinafter described and claimed.

Of the accompanying drawing forming a part of this specification,—

Fig. 1 is a top plan view of a pipe vise embodying the invention.

Fig. 2 is a side view of the same.

Fig. 3 is a section on line 3—3 of Fig. 2.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is an enlargement of a portion of Fig. 3.

Fig. 6 shows in perspective the fulcrum stud and its eccentric hereinafter described.

Fig. 7 is a fragmentary sectional view, showing a portion of one of the jaws, and one of the hereinafter described reducers.

Fig. 7ª is a perspective view of the reducer shown in section by Fig. 7.

Fig. 8 is a section on line 8—8 of Fig. 1.

Fig. 9 is a side view, showing a different embodiment of the invention.

Fig. 10 is a top plan view of the vise shown by Fig. 9.

Fig. 11 is a section on line 11—11 of Fig. 9.

Fig. 12 is a section on line 12—12 of Fig. 9.

Fig. 13 is a fragmentary sectional view, showing brake means for preventing accidental rotation of the fulcrum stud and its eccentric hereinafter described.

The same reference characters indicate the same parts in all of the figures.

The vise shown by Figs. 1 to 8, inclusive, comprises a frame including a base 15, an outer standard 16, projecting outward from the base and constituting a fixed jaw, and an inner standard 17, also projecting outward from the base. The standards and the base are preferably formed as a single casting, the standards being spaced apart to permit the interposition therebetween of the movable jaw next described.

18 designates a movable jaw preferably pivoted at 19 to the base, and adapted to cooperate with the fixed jaw in grasping a body 20, which may be of cylindrical or other form. Preferably each jaw is provided with a plurality of recessed gripping faces, each conforming to the body 20, said faces being of different sizes, and preferably formed in facing members detachably secured to the jaws, as hereinafter described.

The vise includes movable jaw-operating mechanism including a hand lever 21, fulcrumed at 22 on the inner standard 17, pressure-transmitting means operable by a movement of the lever to the position shown by Fig. 2, to press the swinging jaw toward the fixed jaw, and adjusting means for varying the pressing movement of the swinging jaw, and thus enabling the jaws to conform to bodies of various sizes. I embody said adjusting means in a fulcrum stud 23 (Figs. 4 and 6), journaled in bearings 24, on the inner standard 17, and an eccentric 25 on said stud, journalled in a socket 26, formed in an element of the pressure-transmitting means. Said element is, in this instance, a toggle-arm 27, adapted to oscillate on the eccentric and connected by a pivot pin 28 (Fig. 8) with one end of a toggle-link 29, the opposite end of which is connected by a pivot pin 30, with the swinging jaw 18. The toggle-arm and link are connected by the pivot pin 28 with one end of a connecting link 31, the opposite end of which is connected by a pivot pin 32 with the shorter arm of the hand lever 21, the latter being a bell-crank lever, composed of a longer and a shorter arm.

When the toggle formed by the arm 27 and link 29 is straightened or rendered active, as shown by full lines in Fig. 8, the movable jaw is forced toward the fixed jaw, and when the toggle is broken, as shown by dotted lines, the movable jaw is retracted.

It will now be seen that a partial rotation of the pivot stud will so change the radial position of the eccentric 25, as to vary the throw or forward movement imparted by the pivot stud to the swinging jaw. The pivot stud is provided with a knurled projecting head 23ª by which it may be manually rotated.

Accidental rotation of the pivot stud is prevented by the engagement of a spring detent 34 with one of a series of notches 36, in the head 23ª. The pivot stud 23 and its eccentric constitute a simple and conveniently operated adjusted means, adapted to be used in a vise which, as shown by Figs. 9, 10, and 11, and hereinafter described, does not include the toggle-arm 27 and link 29.

To prevent injurious flexure and possible breakage of the base 15, when the movable jaw is under pressure, I provide coupling means connecting the standards 16 and 17,

and including a member 38, carried by one of the standards and provided with an abutment 39, and a member 40 carried by the other standard and provided with a complemental abutment 41, which is pressed against the abutment 39 by strain on the frame tending to flex the base 15. The member 38 is preferably an arm cast integral with the inner standard 17, and the member 40 is preferably a hook pivoted at 42 to the outer standard or fixed jaw 16, and adapted to be displaced, as shown by dotted lines in Fig. 2, to a non-obstructing position permitting free access to the space between the standards.

The described coupling and adjusting means may be employed in a vise of the type shown by the Callan patent, No. 1,112,192, September 29, 1914, the movable jaw being slidable on the base instead of being pivoted thereto. I am not limited, therefore, to a swinging jaw, although I consider the same preferable.

In the embodiment shown by Figs. 9, 10, 11, and 12 the toggle members 27 and 29, and the connecting link 31, are omitted, and the standards 16 and 17 are located closer together than in the embodiment above described. The movable jaw-operating mechanism includes a hand lever 43, fulcrumed on the eccentric 25, and a pressure-transmitting cam 44, constituting the shorter arm of said lever, said cam being in sliding contact with the movable jaw 18, as shown by Fig. 9. The arrangement is such that when the lever 43 is raised, as shown by full lines, the movable jaw is permitted to recede from the fixed jaw, and when the lever is depressed, as shown by dotted lines, the movable jaw is forced by the cam 44 toward the fixed jaw. The throw of the movable jaw toward the fixed jaw is determined by rotative adjustment of the eccentric 25, and the standards are coupled together by the members 38 and 40, as in the embodiment just described.

The recessed gripping faces of the jaws which bear on a body 20, held by the vise, may be formed directly on the standard 16 and on the movable jaw 18. I prefer, however, to provide as a part of each jaw, a detachable facing member 46, so that the fixed jaw includes a standard member 16, fixed to the base, and supporting a facing member, while the movable jaw includes a carrying member 18, hinged to the base, and also supporting a facing member. The members 16 and 18 are provided with irregular side faces 47 having recessed portions meeting to form projecting portions (Fig. 8) and with opposite edge faces from which spring-pressed detents 48 normally project, as shown by Figs. 3 and 5. The detents are preferably balls, movable in sockets 49, and pressed outward by springs 50 against the contracted outer ends 51 of the sockets. The facing members have back faces which are complemental to the faces 47, and are interengaged with the latter to prevent vertical displacement of the facing members from the positions shown by Fig. 8, said back faces being formed to bear on the recessed side faces 47, and provided with flanges 52, overlapping the edge faces of the members 16 and 18, and containing recesses 53, formed to be engaged by the detents 48.

When the facing members 46 are forced to place on the members 16 and 18, the detents 48 are first caused to yield and are then forced outward by the springs into the recesses 53. The facing members may be removed by exerting outward pressure thereon, sufficient to cause the recesses 53 to inwardly displace the detents. The facing members are provided with recessed gripping faces 55, which may be of different sizes, as shown by Figure 8, and may be formed to grip bodies 20 of cylindrical or other form.

The interengagement of the irregular faces 47 with the complemental irregular back faces of the facing members 46, relieve the detents 48 and recesses 53 of the duty of preventing vertical displacement of the facing members from the positions shown by Fig. 8, the only duty required of said detents and recesses being to confine the irregular back faces of the facing members in engagement with the irregular faces 47.

Fig. 7 and 7ª show a reducer 56, adapted to be inserted in a recess 55, to adapt the facing member to a smaller body 20. The reducer is trough-shaped, one of its sides forming a recessed gripping face. The reducer has ears 57 and 58 at its opposite ends, overlapping the edges of the facing member. The ear 58 has a detent 59, which may be a spring-pressed ball, adapted to engage a recess, like the recess 53, in one edge of the facing member. The ear 57 has a set-screw 60, adapted to engage a similar recess in the opposite edge of the facing member.

Any desired number of reducers may be employed, for example, one for each recess 55.

The fulcrum stud 23 and its eccentric 25 may be confined against accidental rotation by a brake shoe 61 (Figure 13), movable in a guide 65, in either the arm 27, or the lever 43, and pressed by a spring 62 against the periphery of the eccentric. The spring is adjustably supported by an abutment screw 64, engaged with a tapped portion of the guide 65. I consider this form of confining means preferable to the spring detent 34 engaging the grooves 36, as shown by Figs. 1, 2, 9, and 10.

I claim:

1. A pipe vise comprising a frame including a base and inner and outer spaced-

apart standards projecting outward from the base, the outer standard constituting a fixed jaw; a movable jaw connected with the base and adapted to cooperate with the fixed jaw; and jaw-operating mechanism including a hand lever fulcrumed on the inner standard, and pressure-imparting means operable by a movement of the lever to press the movable jaw toward the fixed jaw; and coupling means connecting said standards to prevent injurious flexure of the base when the movable jaw is under pressure, said coupling means including a member carried by one of the standards and provided with an abutment, and a member carried by the other standard and provided with a complemental abutment which is pressed against the first-mentioned abutment by strain on the frame tending to flex the base.

2. A pipe vise as specified by claim 1, one of said coupling members being pivoted to the standard by which it is carried, and separably engaged with the other coupling member, so that it is displaceable to a non-obstructing position.

3. A pipe vise comprising a frame having a base and a fixed jaw including a standard member, fixed to and projecting outward from the base; a movable jaw including a carrying member movably connected with the base, said members being provided with irregular inner side faces and opposite edge faces, and with spring-pressed detents normally projecting from the edge faces, said jaws including also facing members having irregular back faces complemental to the said irregular inner faces, and flanges formed to overlap said edge faces and provided with recesses adapted to be engaged by said detents to separably hold said irregular faces interengaged with each other, so that the facing members are detachable from the standard member and the carrying member, the facing members being provided with recessed gripping faces.

4. A pipe vise comprising a frame including a base and inner and outer spaced-apart standards projecting outward from the base, the outer standard constituting a fixed jaw; a movable jaw connected with the base and adapted to cooperate with the fixed jaw; jaw-operating mechanism including a hand lever fulcrumed on the inner standard, pressure-transmitting means operable by a movement of the lever to press the movable jaw toward the fixed jaw, and adjusting means for varying the pressing movement imparted to the movable jaw by said pressure-transmitting means, said adjusting means including a fulcrum stud journaled in fixed bearings on the inner standard, and an eccentric on said stud journaled in a socket formed in an element of the pressure-transmitting means, so that said socketed element is mounted on the eccentric, said stud being manually rotatable to vary the position of the socketed element and the throw imparted to the movable jaw, a brake shoe movable in a guide in the socketed element mounted on the eccentric, a spring pressing the shoe against the periphery of the eccentric, and an adjustable abutment screw supporting the spring.

In testimony whereof I have affixed my signature.

HERBERT G. BUTT.