No. 769,814. PATENTED SEPT. 13, 1904.

G. W. BUFFORD & G. F. HICKMAN.

PIPE VISE.

APPLICATION FILED JAN. 25, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 4.

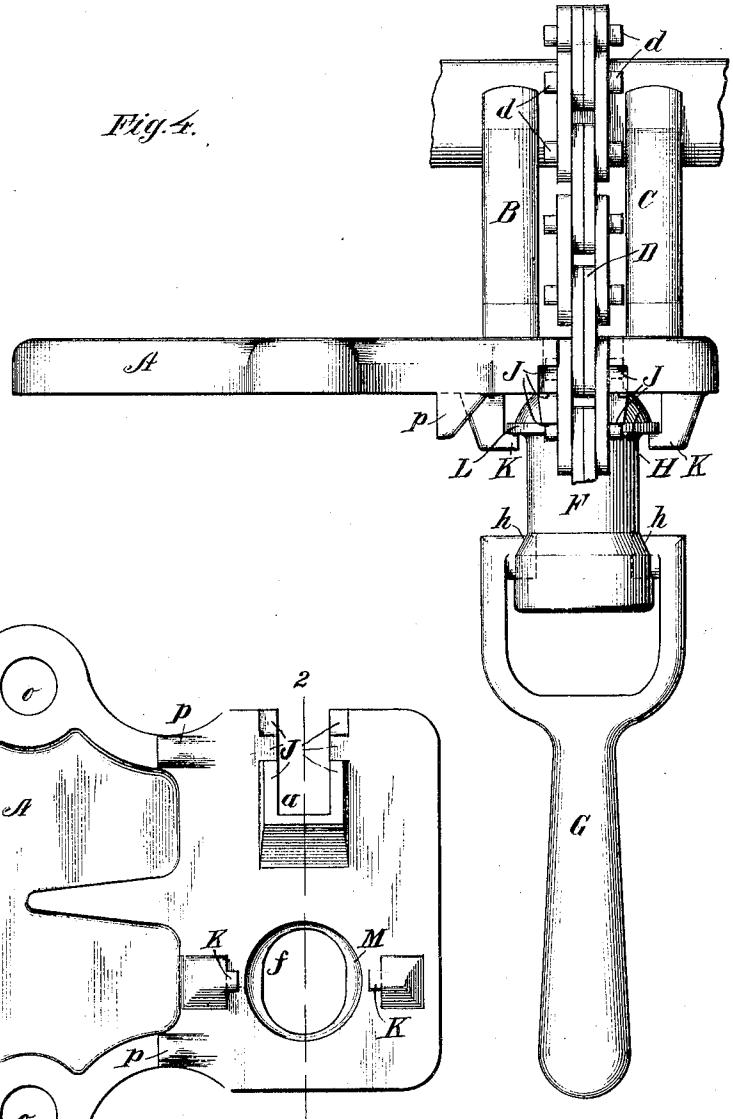
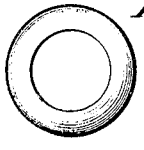


Fig. 1.

Fig. 5.



Witnesses
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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

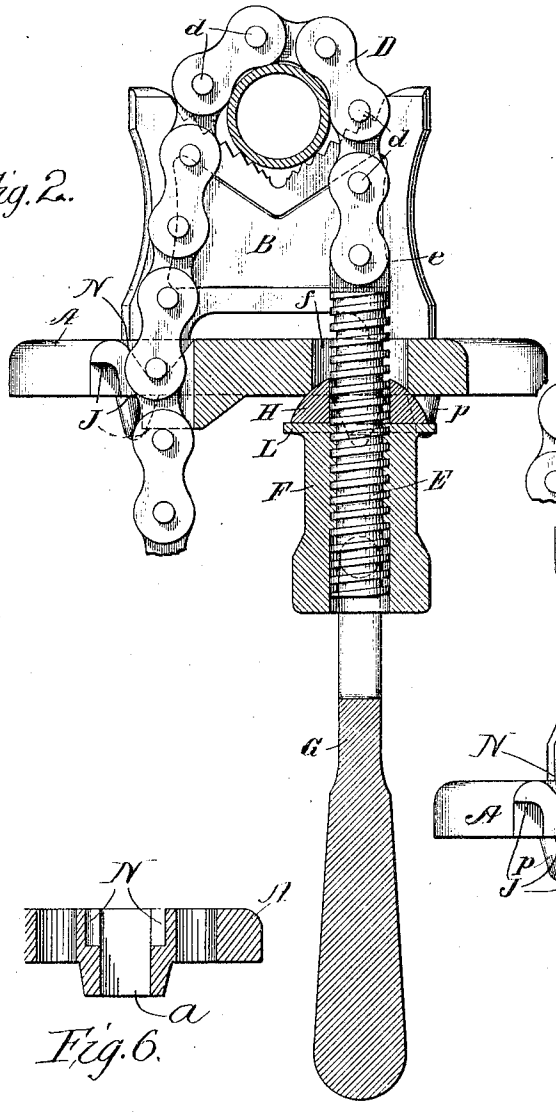


Fig. 3.

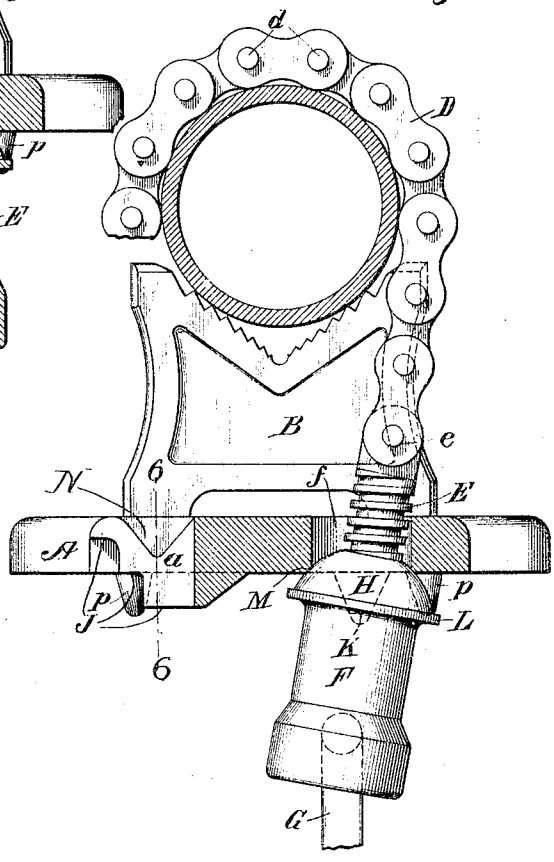


Fig. 6.

Witnesses

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No. 769,814. Patented September 13, 1904.

UNITED STATES PATENT OFFICE.

GEORGE W. BUFFORD, OF BROOKLYN, NEW YORK, AND GEORGE F. HICKMAN, OF NEWARK, NEW JERSEY, ASSIGNORS TO J. H. WILLIAMS AND COMPANY, OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

PIPE-VISE.

SPECIFICATION forming part of Letters Patent No. 769,814, dated September 13, 1904.

Application filed January 25, 1904. Serial No. 190,593. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. BUFFORD, residing in the borough of Brooklyn, county of Kings, city and State of New York, and GEORGE F. HICKMAN, residing at Newark, in the county of Essex and State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Pipe-Vises, of which the following is a specification.

The present invention relates more particularly to that type or character of pipe-vise shown and described in United States Patent to William J. Grinden, No. 743,072, dated November 3, 1903, which patent is owned by our assignee.

The improvements which we are about to describe and claim as our invention accomplish a three-fold purpose, thereby obviating certain difficulties which have been encountered in the use of the vise of the Grinden patent.

In the drawings presented herewith as embodying a preferred form of our invention, Figure 1 is a bottom plan view of the base of the vise and such parts thereof as are formed conveniently integrally with said base. Fig. 2 is a vertical section of the vise along the line 2 3 of Fig. 1, showing the vise as it appears when gripping a pipe of small diameter. Fig. 3 is a partial vertical section of the vise along the line 2 3 of Fig. 1 and shows the relative positions of parts when a pipe of large diameter is being gripped. Fig. 4 is a side elevation of the vise. Fig. 5 is a plan view of a washer of the adjusting-nut which is to be referred to later. Fig. 6 is a sectional view of the base of the vise along the line 6 6 of Fig. 3.

In so far as the parts of the vise shown herewith correspond to those of the above-mentioned Grinden patent they are given the same reference characters as in the said Grinden patent.

A is the base of the vise.

B and C are the jaws.

D is the chain which coöperates with the said jaws B and C to grip the pipe which rests in said jaws. Said chain D has pintles *d*, which project outwardly beyond the links.

E is a screw pivotally attached at *e* to one end of the chain D.

f is an aperture in the base A of the vise, through which passes the said screw E. Said aperture *f* is preferably oval in cross-section and has at its lower extremity, entrant into the base A of the vise, a concave spherical surface M, which forms a seat for the semi-spherical washer H.

F is the adjusting-nut of the vise, which engages the screw E. This nut F bears a handle-lever G, which is capable of rotation about the bearings *h* and hangs vertically below the nut when not in use.

a is a slot in the base A of the vise, in which hangs the loose end of the chain D when the vise is in use.

J represents inverted steps, formed, preferably, integrally with the base A of the vise, which serve as points of engagement for the projecting pintles *d* of the chain D when it is desired to secure the loose end thereof in order that it may perform its gripping function.

K represents lugs on the lower face of the base A, which, coacting with the flange L of the adjusting-nut F, maintain said nut F and parts associated with it in their proper positions relative to the base A of the vise.

N represents recesses in the walls of the slot *a*, which are adapted to permit a pintle of the chain D to enter the slot *a* when the next adjacent lower pintle is about to be thrust into engagement with the lower steps J, as is clearly shown in Fig. 2.

The said base is provided with appropriate apertures *o*, by means of which it may be bolted to any suitable bench or other support, and has lugs *p* to position it on the bench.

The first purpose of our invention is to provide for the proper application and transmission of the varying stresses brought upon the

adjusting-screw E of the vise in gripping pipes of different diameters. By referring to the drawings of the said Grinden patent it will be seen that the stress exerted through the chain D of the vise is applied to the top *e* of the adjusting-screw E at different angles, according to the size of the pipe which is being gripped, while the screw E itself is maintained in a constant vertical position by the walls of the hole *f*. Hence when a pipe of large diameter is being gripped the stress of the chain is exerted at such an angle to the longitudinal axis of the said screw as to strain it outward from the center of the vise, and when a pipe of small diameter is being gripped the reverse applies and the said screw is strained inwardly. As it is commonly necessary to use a single vise to grip pipes of widely-differing diameters, it soon comes to pass, as has been demonstrated by experience, that the said screw is so far bent from its normal shape as to be jammed within the hole *f*. Moreover, the stresses constantly varying in direction inevitably so injure the threads of the said screw as to render impossible the proper adjustment thereof. The present invention overcomes these difficulties by altering the shape of the screw-receiving aperture *f* in the base of the vise to permit movement of the said screw E therein by supplying a rocking head H for the adjusting-nut F and by providing a correspondingly-formed recess M in the base of the vise to receive and form a seat for the said rocking head H. This arrangement permits the adjusting-screw to shift the position of its axis to accord with the direction of the stress of the chain, so that said axis and the direction of said stress may lie in the same straight line. The rocking head H is preferably given the form of a washer separate from the nut F and having a curved upper face. This permits the said curved upper face to remain fixed in its seat, while the friction of the turning nut is borne by the plane under surface of the washer. It is apparent, however, that the rocking head and the nut might be made integral. It would be quite possible to alter somewhat the specific forms and arrangement of parts shown and described in this connection without materially affecting the efficiency of the vise. For example, the rocking head H might be given the form of a washer having a semicylindrical upper face, with a correspondingly-formed seat recessed in the base of the vise, the axis of said seat being parallel to the length of a pipe resting in the jaws to permit of the rocking of the screw E in the plane of the chain D of the vise. It is to be understood that such changes as the one here suggested lie wholly within the scope of our invention.

The second purpose of our invention is to supply means for retaining the adjusting-nut F permanently in position close to the under surface of the base of the vise. In the Grinden vise whenever the chain is released the lever G, the adjusting-nut F, and the screw E will fall away from the base, necessitating a readjustment of these parts by the operator when the vise is again to be used. By employing lugs K upon the said under surface of the base of the vise, with a coacting flange L on the adjusting-nut F, the said lever, adjusting-nut, and screw are held in their proper positions relative to the base of the vise, so the tool is always ready for immediate use without the readjustment by the operator necessary in the use of the Grinden vise. The lugs K and the flange L are but a single one of the many possible embodiments of this part of our invention. The positions of lugs and flange might be interchanged, with proper modifications, the former becoming a part of the nut F and the latter a part of the base A of the vise. Any changes such as are here exemplified are to be understood to come within the scope of the present invention.

The above description treats of two groups of parts of the present improved vise, each group being considered individually as accomplishing a unitary purpose of this invention. Great importance attaches to the arrangement of the said two groups in such manner that each will contribute to the effective operation of the other. For example, the lugs K are desirably so placed as to perform their retaining function and at the same time to facilitate the movement of the screw E upon its rocking head H. To this end the lugs K are placed upon opposite sides of the aperture *f* in the base of the device, each lug being upon the same side of said aperture as a jaw of the vise. The upper faces of the said lugs are conveniently curved where they extend beneath the flange L of the adjusting-nut F. Owing to this construction the lugs do not interfere with the rocking of the nut and screw, which is mainly in a plane perpendicular to a line passing between the lugs. It is also desirable to allow a slight play between the lugs K and the coacting flange L to permit of sidewise rocking of the screw between the jaws when a pipe of irregular conformation is being gripped.

The third purpose of our invention is to facilitate the adjustment of the parts of the vise when it is desired to grip a pipe between the jaws and the chain. In the base of the Grinden vise there is provided a slot *a*, through which passes the loose end of the chain of the vise. The under face of the said base of the vise at the edges of the said slot engages one of the projecting pintles *d* of the chain when said chain is drawn tight in gripping a pipe. When the vise is to be used, a pipe is placed in its jaws, the chain is thrown over the said

pipe, and its loose end thrust into the said slot. At this point in the operation of the vise it is highly probable that no pintle is in exactly the proper position to be immediately engaged by the under faces of the slot, so there remains considerable slack in the chain, which must be drawn up by means of the adjusting-screw. This operation consumes time and labor. Should points of engagement for the pintles be provided at different distances from the pipe resting in the jaws of the vise, the likelihood that a pintle would be in a position to be engaged immediately at some one of these points would be increased in direct proportion to the number of such points. It is a part of our invention to provide several such points of engagement for the chain-pintles, and the use of said points materially lessens the work of adjusting the vise. In this connection we show in the accompanying drawings as embodying our invention three of these points of engagement, which we conveniently give the form of two series of steps J, one on each side of a slot *a*, comparable to the slot *a* of the Grinden vise. To coöperate with the said series of steps J the recesses N are provided, (clearly shown in Figs. 3 and 6,) which are adapted to receive a pintle of the chain when the next adjacent lower pintle is being engaged by the lower steps J. It is obvious that a provision of this nature is important in order that the lower steps may be used. There are innumerable variations possible in the form and number of these points of engagement and in the form of the coöperating recesses. We show the steps J and the recesses N merely for the purpose of explaining the principle of our invention, and it is to be understood that we do not limit ourselves to the specific construction disclosed.

The mode of operation of the vise is as follows: A pipe is placed upon the jaws. The chain is drawn over the said pipe and its loose end thrust into the slot *a*. The projecting pintle of the chain which is found nearest to a pair of the steps J is slipped beneath that pair which admits of the least slack in the chain. The nut F by means of its handle-lever G is screwed up until the chain has been drawn sufficiently tight. Thereupon the pipe may be operated upon without danger of its moving in the vise.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A chain-pipe vise having, in combination, a rigid base having an opening therein, complementary jaws on the upper side of said base and on opposite sides of said opening, an intermediate chain, means for attaching one end of said chain to said base, an adjusting-screw attached to the other end of said chain and extending through said opening in said base, a rocking washer loose upon said screw having a curved face fitting a seat on the under side of said base, a flanged nut turning on said screw below said washer and adapted to seat upon the under face of said washer, a hand-lever attached to said nut for turning it, and retaining-lugs on the under side of said base on diametrically opposite sides of said opening which extend beneath the flange on said nut, each lug being on the same side of said opening as one of said jaws.

2. A chain-pipe vise having, in combination, a rigid base having an opening therein, complementary jaws on the upper side of said base and on opposite sides of said opening, an intermediate chain, means for attaching one end of said chain to said base, an adjusting-screw attached to the other end of said chain and extending through said opening in said base, a flanged nut turning on said screw below said base, a hand-lever attached to said nut for turning it, and retaining-lugs on the under side of said base on opposite sides of said opening which extend beneath the flange on said nut, each lug being on the same side of said opening as one of said jaws.

3. A chain-pipe vise having, in combination, a rigid base having an opening therein, complementary jaws on the upper side of said base and on opposite sides of said opening, an intermediate chain, means for attaching one end of said chain to said base, an adjusting-screw attached to the other end of said chain and extending through said opening in said base, a curved seat on the under side of said base, a flanged nut turning on said screw below said base and adapted to rock with respect to said curved seat, a hand-lever attached to said nut for turning it, and retaining-lugs on the under side of said base on opposite sides of said opening which extend beneath the flange on said nut, each lug being on the same side of said opening as one of said jaws.

4. A chain-pipe vise having, in combination, a chain with an unattached end, projecting pintles on said chain, and a plurality of independent points of engagement for said pintles, said points of engagement being positioned progressively nearer to the center of the vise.

5. A chain-pipe vise having, in combination, a chain with an unattached end, projecting pintles on said chain, and a plurality of points of engagement for said pintles, the distance between adjacent pairs of said points of engagement being different from the distance between adjacent pintles of said chain.

6. A chain-pipe vise having, in combination, a chain with an unattached end, projecting pintles on said chain, a plurality of points of engagement for said pintles, the distance between adjacent points of engagement being different from the distance between adjacent pintles, and recesses adapted to receive a chain-pintle next adjacent to the one in engagement.

7. A chain-pipe vise having, in combination, a chain with an unattached end, projecting pintles on said chain, a plurality of points of engagement for said pintles positioned progressively nearer to the center of the vise and recesses adapted to receive a chain-pintle next adjacent to the one in engagement.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE W. BUFFORD.
GEORGE F. HICKMAN.

Witnesses:
MORTIMER J. TRAVIS,
WILLIAM H. ANDERSON, Jr.