G. AMBORN.

CHAIN PIPE VISE.

APPLICATION FILED DEC. 27, 1911.

1,158,414. Patented Oct. 26, 1915.

Fig. 1.

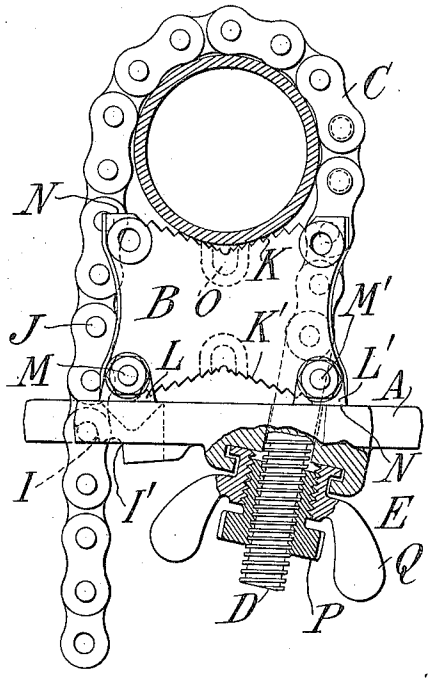


Fig. 2.

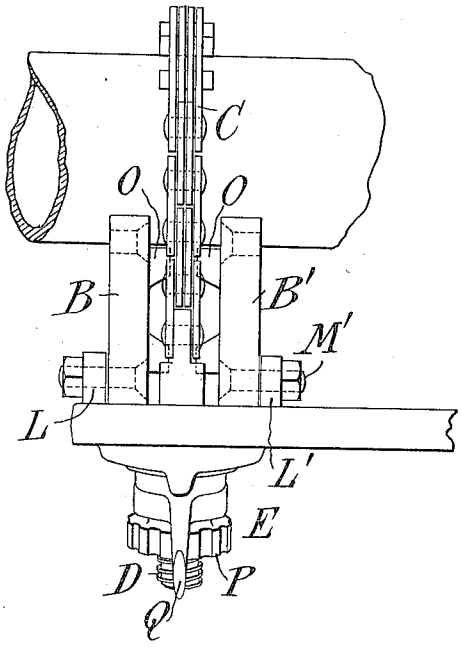


Fig. 3.

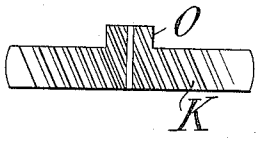
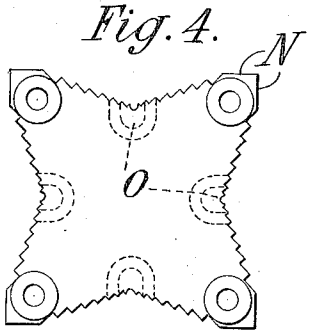


Fig. 4.



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CHAIN PIPE-VISE.

1,158,414. Specification of Letters Patent. Patented Oct. 26, 1915.

Application filed December 27, 1911. Serial No. 668,057.

To all whom it may concern:

Be it known that I, GEORGE AMBORN, a citizen of the United States, residing in Chapinville, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Chain Pipe-Vises, of which the following is a specification.

This invention relates to chain pipe vises, and aims to provide certain improvements therein. In the present constructions of vises of this type two upstanding jaws are usually provided upon which the pipe rests, a chain or similar member being utilized to hold the pipe in position. The active or working faces of the jaws are serrated or toothed so as to grip the pipe and prevent its turning. In this construction of vise, when the serrations become dulled, it is necessary to sharpen them or replace them with new jaw pieces. According to the present invention I provide a construction in which the jaws are formed with a plurality of working faces so that when one set becomes dulled the jaws may be shifted to bring another set into operative position.

The vise also includes certain other features of invention which will be hereinafter more fully described.

In the drawings which illustrate different forms of the invention—Figure 1 is a side elevation of one form. Fig. 2 is an end elevation of Fig. 1. Fig. 3 is a top or plan view of one of the jaws. Fig. 4 is a side elevation of another form of jaw.

Referring first to the construction shown in Figs. 1 to 3, let A indicate a suitable bed plate or base by means of which the device is mounted upon a bench or other convenient support. B B′ are the upstanding jaws which are usually two in number, upon the upper edges of which the pipe rests when the device is in use. The pipe is held firmly in position against rotative and other movements by a chain C which may be variously applied and operated. The jaws are spaced apart to permit the chain to pass between them. In the construction shown one end of the chain is fixed to a sliding screw-threaded bolt D passing through the bed plate and projecting below the same where it is engaged by a take-up member E. The opposite end of the chain is usually free, and means are provided for locking such end to a fixed or stationary part such as the bed plate A. In the construction shown the bed plate is provided with locking lugs or faces I I′ which are adapted to be engaged by pintles J formed upon or carried by the links of the chain. In the construction shown the pintles J comprise also the pivot pins of the chain.

The present invention principally relates to the construction of the jaws B B′, and the means for mounting such jaws upon the bed plate A. The jaws are polygonal plates having side edges with work-engaging seats therein. In the construction shown in Figs. 1 to 3 each jaw consists of a single piece of metal provided with a plurality of pipe seats or working faces K K′, and the jaws and their mounting means are so constructed as to permit the jaws to be reversed so that either working face may be brought into operative position.

My invention also provides means or provisions for detachably mounting the jaws in their several positions, so that they shall be held fixedly or immovably under the conditions of use. The jaw members have means whereby different edge-portions may be secured to the base, and the base has fastening means coacting interchangeably therewith. In the construction shown I have provided a pair of lugs L L′ for each jaw, such lugs being preferably formed integrally with the base plate A, and being designed to receive bolts M M′ which pass through the jaws and lugs. The jaws are formed with two sets of bolt holes so that they may be fastened to the lugs in either position. In order to relieve the bolts of as much strain as possible the jaws may be formed with seating faces N which bear against the upper face of the bed plate A; in this construction the main function of the bolts is to hold the jaws in their upright positions.

In Fig. 4 I have illustrated a jaw having four working faces instead of two which are shown in Figs. 1 and 2. In this construction the jaw is preferably made somewhat higher so that the bolt holes are equi-distantly spaced whereby the latter register with the lugs L L′ in any one of the four positions of the jaw. In this construction the jaws are provided with eight bearing faces N.

It is desirable in pipe vises that the jaws be spaced apart such a distance as will secure a rigid seat for a pipe of large diameter.

In operating with a pipe of small size, however, particularly when the pipe is thin walled, considerable care must be used in tightening the chain, since the pipe is apt to bend when supported by jaws which are somewhat remote from each other. According to the present invention I preferably provide means whereby such pipes may be adequately supported without danger of injury and without increasing materially the weight of metal which is contained in the jaws. To this end I provide the inner sides of the jaws with lugs O O arranged at the throat or apex of the inclined working faces, and extending inwardly preferably to such extent that their inner faces are located within the lines described by the two sides of the chain. By this means small pipes which contact with the working faces close to the apices of the inclines are supported close to or within the lines of strain exerted by the chain, so that bending is either minimized or entirely avoided. The lugs are preferably provided with serrated faces or teeth which are best formed as elongations of the corresponding teeth on the bodies of the jaws. In the construction of Figs. 1 and 2 I have illustrated two sets of such lugs, but a number corresponding to the number of working faces may be employed. In the construction of Fig. 4 I have illustrated four sets of lugs one on each working face. In the type of vise generally used wherein the chain passes between the jaws for a portion of its length, it will be seen that when a pipe of small size is gripped the lugs O, which are at the sides of the jaw in Fig. 4, would be engaged by the chain, so that the latter would not pass directly to its lock and adjusting bolt. If this is disadvantageous for any particular purpose, the lugs O may be so constructed that their inner faces are separated a greater distance than the width of the chain so that the latter may pass between them.

The working faces K of the jaws as now constructed usually comprise two inclined faces meeting each other at an angle which is very close to 90°. This construction has been practically universally adopted as the best to meet the requirements of use. I have found, however, that if these faces are so formed that they meet each other at a much more obtuse angle, better results are obtained in practice. In the usual constructions if for any reason the pipe is not clamped as tightly as is necessary during the operations which are performed on the pipe, for instance that of tapping or threading, the pipe will slip or turn. This necessitates the interruption of the operation and often mars the pipe. By constructing the working faces K so that each face approaches quite nearly the horizontal, I have found in practice that instead of slipping the pipe will ride up one of the inclines sufficiently to wedge itself, even though there be some considerable slackness in the chain, thus materially increasing the convenience of use of the vise. Whatever the angle of the working faces, I prefer that it be substantially the same for both the jaws K K′, as shown in Fig. 1, so that when one face becomes too worn for efficient use another may be substituted which is of identical design and presumably the best suited to the work in hand. The working faces of the jaws are also preferably provided with teeth which extend in an oblique direction or directions, as shown in Fig. 3. The teeth as thus constructed have a better gripping effect upon the pipe due to the fact that each tooth contacts with the round surface of the pipe at one point only instead of across the entire width of the tooth.

My invention also provides certain improvements in the construction of the take-up device E by means of which the coarse or rough adjustments which are necessary to take up the slack of the chain may be quickly made, while the finer adjustments necessary for the actual tightening of the chain about the pipe are made by a member capable of exerting considerable power. By these means the operation of clamping the chain about the pipe may be very quickly and easily performed. In the construction illustrated the vise comprises a nut P which engages the screw-threaded bolt D, which nut is itself provided with an exterior screw-thread designed to be engaged by a second nut Q. In this construction the nut P is shown as knurled and is adapted to quickly take up the slack of the chain, while the nut Q is preferably provided with wings and it is adapted for a slower movement to tighten the chain. The inner face of the power nut Q bears against a suitable abutment on the under side of the bed plate. The thread of the quick acting nut P where it engages the bolt D is preferably of greater pitch than the thread of the power nut Q. Both of the threads have a right-hand thread. The effect of this construction is that, when the quick acting nut P is rotated, the bolt D is drawn down quickly because of the greater pitch of its thread. When the slack is taken up, the power nut Q is operated, and because of its finer thread considerably greater power is exerted to clamp the chain about the pipe. By this construction the speed at which the chain can be tightened and clamped is increased and the take-up mechanism is rendered more compact than those now in use. In this application I do not claim broadly the use of a speed nut and a power nut, since this forms the subject matter of another application filed on even date herewith.

It will be observed that each of the V-

shaped faces of the jaws is like the others. Each such face is designed to take a variety of sizes of pipe. For this purpose the teeth are larger and farther apart as they are located at successively greater distances from the apex of the V and are also shaped and pointed in such direction as to most effectively engage pipes of increased diameters as the teeth in question are located at successively greater distances from said apex.

I have shown and described the present invention with reference to a type of vise which is now largely used, but it is to be understood that the invention is susceptible of use in connection with other types of vises. For instance, it is not strictly essential that two jaws be used; on the other hand, more than two may be employed. Furthermore, the means for holding the jaws in place may also be widely varied. Other changes may be made in the construction shown without departing from the invention.

What I claim is:—

1. In a pipe vise or the like, the combination with a base member, of a plurality of upstanding spaced apart jaw members, each consisting of a polygonal plate having side edges with work engaging seats therein and each having substantially equal spaced means whereby different edge portions of the upstanding jaw members can be fixedly secured to the base, with means on the base coöperating interchangeably with said other securing means and common to the different edges having the work engaging seats therein, a chain attaching part, and a chain adapted to pass between the upstanding members.

2. In a pipe vise or the like, the combination with the base of a plurality of upstanding reversible jaw members, each consisting of a rectangular plate having substantially equal sides with work holding seats therein, and means for interchangeably securing each of the different sides of the upstanding jaws to the base and maintaining them in spaced relation to admit of the passage of a chain therebetween.

3. A chain pipe vise including in combination a jaw having a plurality of working faces and having a series of holes, a base plate, and means passing through said holes for fastening said jaw to said base plate in different positions so as to bring different working faces into operative position.

4. A chain pipe vise including in combination a base plate having a pair of lugs, a jaw having a plurality of working faces, said jaw having a plurality of holes arranged in identical pairs, one pair opposite each working face, and bolts adapted to pass through said lugs and said holes for holding said jaw in its several working positions.

5. A vise including in combination a plurality of jaws, each formed with a working face, clamping means bearing on the pipe in a plane between said working faces of the jaws, and a lug on each jaw, said lugs adapted to extend between the jaws and adapted to form an extended support for a pipe in contact with said jaws.

6. A chain pipe vise including in combination a plurality of jaws, each having a plurality of working faces, means for supporting said jaws in different positions so as to bring different working faces into operative position, a chain located in a plane between said jaws, and lugs extending inward laterally from the bodies of said jaws at the apices of said working faces and adapted to form extended supports for a pipe.

7. In a chain pipe vise or the like, a jaw, a chain, and means for tightening the chain, comprising a screw-threaded bolt D on one end of the chain, a speed nut P engaging said bolt with a thread of comparatively great pitch, and a power nut Q threaded on said speed nut with a thread of comparatively low pitch and engaging a fixed abutment, said nuts being separately accessible and operable so that the speed nut can be first turned to take up the slack quickly to the desired extent and the power nut can then be turned to clamp the chain firmly.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE AMBORN.

Witnesses:
CHARLES B. HARRIS,
VICTOR F. ROLINS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."