

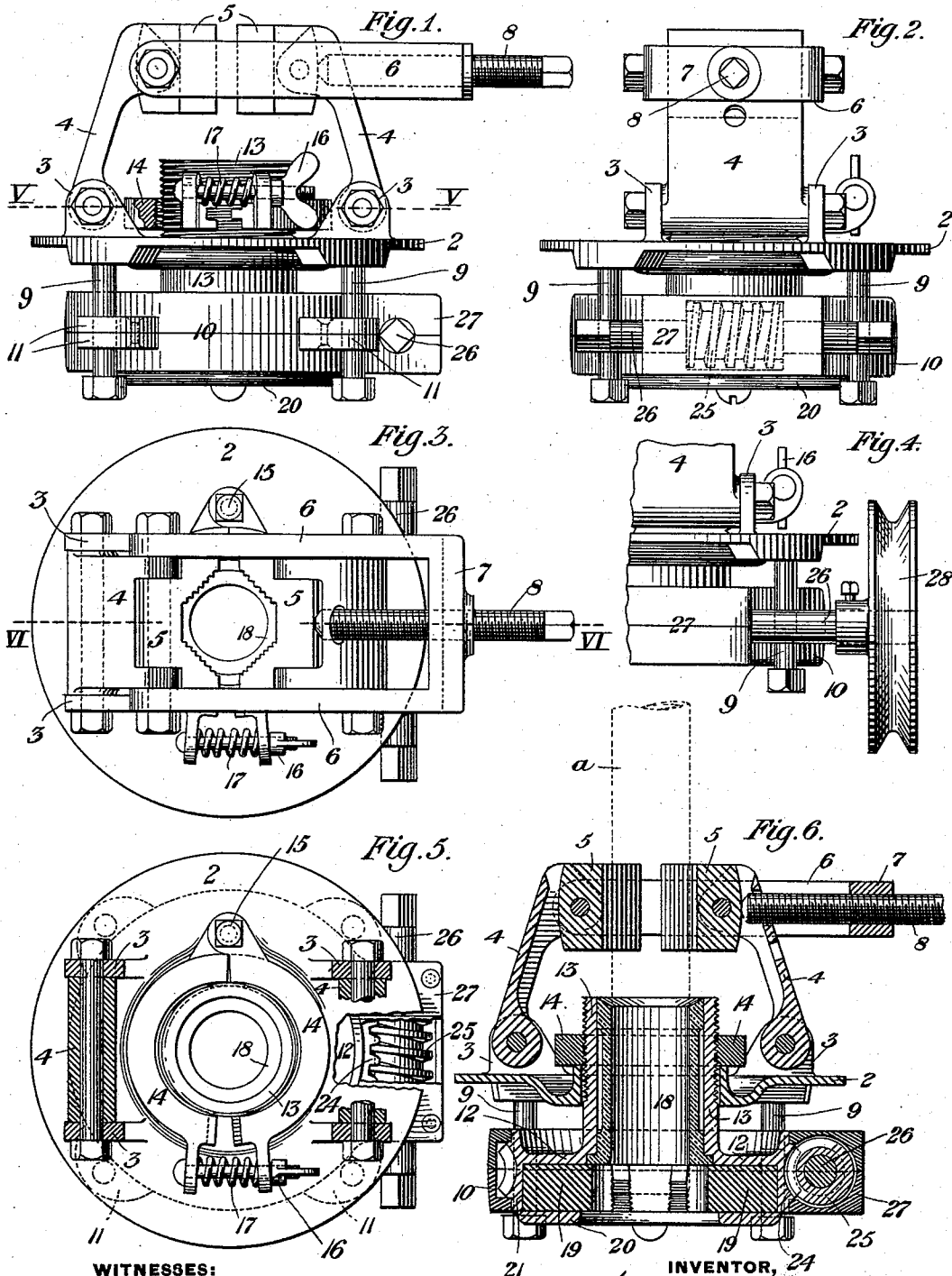
(No Model.)

2 Sheets—Sheet 1.

W. E. MELHORN.
COMBINATION VISE AND SCREW CUTTER.

No. 576,873.

Patented Feb. 9, 1897.



WITNESSES:

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Geo. M. Harton

INVENTOR, 24

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By C. M. Clarke Att'y

(No Model.)

2 Sheets—Sheet 2.

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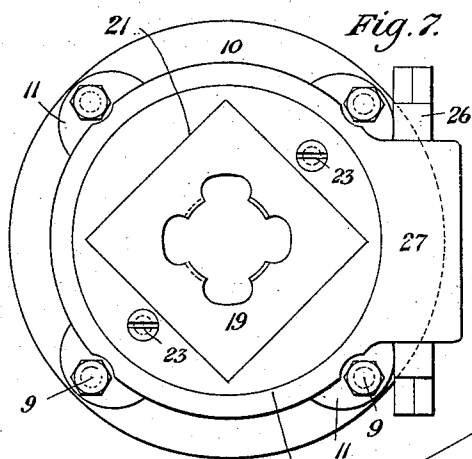


Fig. 7.

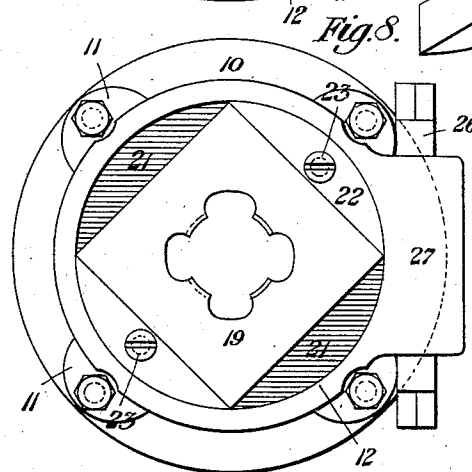


Fig. 8.

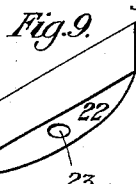


Fig. 9.

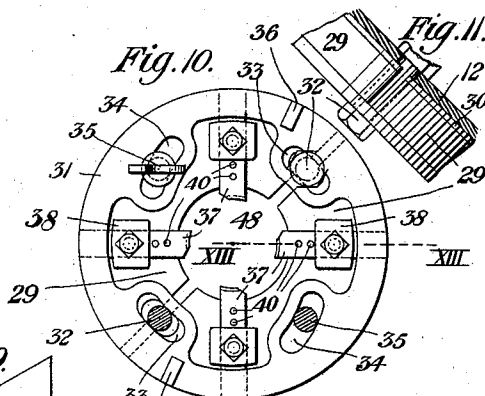


Fig. 10.

Fig. 11.

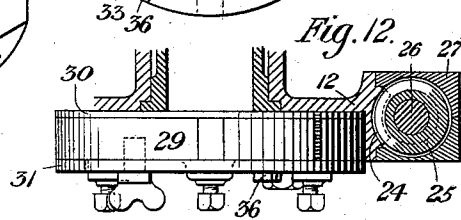


Fig. 12.

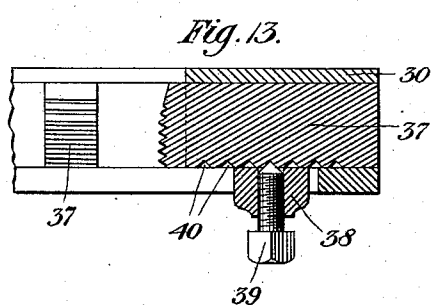


Fig. 13.

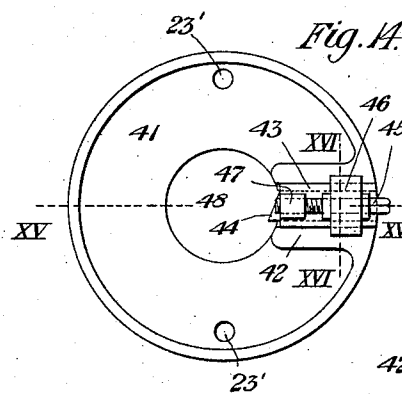


Fig. 14.

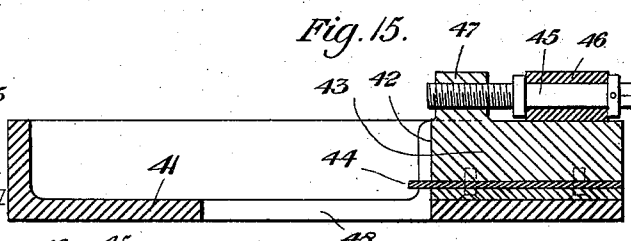


Fig. 15.

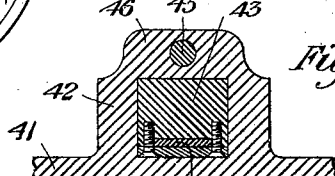


Fig. 16.

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UNITED STATES PATENT OFFICE.

WILLIAM E. MELHORN, OF KNOXVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO V. Q. HICKMAN, OF PITTSBURG, PENNSYLVANIA.

COMBINATION VISE AND SCREW-CUTTER.

SPECIFICATION forming part of Letters Patent No. 576,873, dated February 9, 1897.

Application filed October 5, 1896. Serial No. 607,970. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. MELHORN, a citizen of the United States, residing at Knoxville, in the county of Allegheny and State of Pennsylvania, have invented or discovered a new and useful Improvement in a Combination Vise and Screw-Cutter, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved pipe vise and threader. Fig. 2 is a front elevation thereof. Fig. 3 is a plan view. Fig. 4 is a detached detail view showing a sheave-wheel secured to the driving-shaft. Fig. 5 is a sectional plan view below the line V V of Fig. 1. Fig. 6 is a vertical sectional view taken on the line VI VI of Fig. 3. Fig. 7 is a face view of the under side. Fig. 8 is a similar view, but showing a modification in the means for securing the cutting-die in position. Fig. 9 is a detached detail view in perspective of one of the die-holding blocks. Fig. 10 is a face view of a modified form of cutting-die. Fig. 11 is a partial detached edge view thereof. Fig. 12 is an edge view in elevation of the die shown in Fig. 10, parts of the operative mechanism of the machine being shown therewith. Fig. 13 is an enlarged cross-sectional view taken on the line XIII XIII of Fig. 10. Fig. 14 is a face view of the cutting-off device. Fig. 15 is an enlarged cross-section through Fig. 14 on the line XV XV thereof. Fig. 16 is a cross-section on the line XVI XVI of Fig. 14.

Similar numerals of reference refer to like parts wherever used throughout this specification.

My invention consists of a portable pipe vise and threader comprised in one tool and adapted to be applied to and operated on a pipe without requiring its removal to and from an operating location, thereby greatly facilitating and cheapening the work of cutting threads in the field.

It also consists in mechanism for cutting off and in an adjustable thread-cutting attachment, as shall be more fully hereinafter set forth.

Referring now to the drawings, 2 is a circu-

lar base-plate provided on its upper face with lugs 3, to which are hinged the vise-supports 4. In the inner upper ends of these hinged supports 4 are the gripping-jaws 5, properly shaped and interiorly corrugated, as shown in Fig. 3, to firmly grasp a pipe *a*, (indicated by dotted lines in Fig. 6.) A divided clamp-arm 6 is secured to the top of one of the supports by the same bolt holding the grip, while through an enlargement or boss on the square end 7 of the clamp-arm a temper-screw 8 is tapped, its inner end bearing against the opposite grip, also similarly pivoted.

When the temper-screw is applied, pressure will be exerted equally on each side by reason of the construction of the clamp, and owing to the fact that the supports 4 are pivoted at the bottom equidistant from the center, and to such equal pressure the pipe embraced by the vise will always assume and retain a central position in relation to the other parts of the machine.

Supported by four bolts 9, extending from the main plate 2, is a housing 10, made in two parts and secured together by screws or rivets through the bolt-lugs 11, which housing contains the central revolving die-holder 12, having an upwardly-extending hollow neck 13, externally threaded, of the same pitch as the thread desired to be cut, passing through a central circular aperture in the plate 2. An expansible nut 14, made in two parts, pivoted together and to the main plate 2 at 15, serves to engage the threads of the neck 13 when secured in engagement with the threads by the thumb-screw 16, a coiled compressed spring 17 opening the nut when the screw is reversed, as shown in Fig. 5.

In Fig. 6 the nut is shown in engagement with the threads of the sleeve.

Within the sleeve a hollow bushing 18 fits snugly, and several of these bushings are preferably provided of varying diameters to suit different sizes of pipe.

The thread-cutting die 19, of ordinary construction, is held within the revolving die-holder 12 by means of a plate 20, secured on the bottom of the holder by screws or bolts, the die fitting snugly into a square recess 21 in the body of the holder and flush with its bottom. An alternative construction is illus-

trated in Figs. 8 and 9, in which the opening 21 is circular and the square die is held in position by oppositely-located segmental-shaped blocks 22, secured in position by bolts 5 passing through holes 23 and tapped into the face of the holder.

It will be seen that the corners of the die correspond with the corners made by the face of the blocks and the circular inner edge of the opening 21. The round opening is also more easily adapted to receive the circular die and cutting-off tool illustrated in Figs. 10, 12, and 14, and it is so made in order to provide for such additional parts.

The revolving die-holder 12 is provided with a series of worm-gear teeth 24, meshing into a driving worm-wheel 25, mounted on a shaft 26 within a hollow box extension 27 of the housing 10.

Ordinarily the shaft 26 is provided with square ends, so that it may be turned by a suitably-shaped crank or wrench from either side. If desired, however, a sheave-wheel 28 may be secured to the shaft, whereby it may be driven by power, as shown in Fig. 4.

The die-holder shown in Fig. 10 is composed of two semicircular base-plates 29, reinforced on the bottom with correspondingly-shaped plates 30 and provided with a circular cover-plate 31, the whole structure being bolted to the revolving die-holder by bolts 32, passing through radial slots 33 in plate 31 and between the meeting faces of the base-plate 29 and plates 30 with sufficient clearance for adjustment of these plates.

At opposite sides of the plate 31 are cam-grooves 34, through which pass thumb-screws 35 into the base-plates.

The rotation of the plate 31 will operate to close or open the base-plates 29, and also the therein-mounted thread-cutting dies 37, by reason of the action of the cam-faces of the grooves 34 upon the bolts 35.

Adjusting set-screws 51 are provided in the base-plates 29, by which the limit of inward movement may be very accurately gaged, and in case of wear of the cutting-dies such wear may be compensated for by setting in the screws.

The plate 31 may be turned by means of lugs 36, and such turning action will cause the base-plates and their contained thread-cutting dies 37 to be adjusted very accurately to an exact gage, when the thumb-screws may be turned down and the parts will remain in such fixed position.

The thread-cutting dies 37 are mounted in transverse grooves oppositely located in the base-plates, overarching lugs 38 connecting the opposite sides and containing set-screws 39, the points of which enter holes 40 in the tops of the dies, regularly spaced to correspond to the desired gage of thread, and hold the dies firmly in position.

Any slight variation due to wear or other causes may be compensated for in the way already described.

The cutting-off die (shown in Fig. 14) consists of a circular base-plate 41, adapted to be set into the circular opening of the housing 12 and secured thereto by bolts through the holes 23' and having at one side a reinforced slideway 42, within which is mounted the cutter-holder 43, to which is secured in any desired or preferred manner the cutter 44.

The cutter-holder is adjusted toward and from the center by means of a temper-screw 45, mounted in a lug 46 and engaging a threaded boss 47, projecting upwardly from the cutter-holder.

It will be seen that suitable circular openings 48 are left in the center of the adjustable die holder and cutter to permit of the passage of the pipe.

The operation is as follows: After having inserted the die 19 of proper gage or having adjusted the die shown in Fig. 10 to proper size and having inserted the bushing 18 of corresponding diameter for the outside of the pipe, the housing having been set out to the limit of its extension against the heads of the bolts 9, the expansible nut 14 is then clamped around the threaded neck 13, and the end of the pipe is inserted between the gripping-jaws 5, through the bushing 18, toward the die, and into contact with the thread-cutters. The gripping-jaws are then closed by turning the temper-screw 8 until the pipe is firmly grasped and held against rotation. Rotary motion is then transmitted to the die-holder 12 through the worm-gearing by means of a crank applied to the shaft 26, when the die will commence to cut a thread upon the pipe. By reason of the expansible nut 14 being held stationary upon the plate 2 by the pivotal bolt 15, the threaded sleeve 13, integral and revolving with the holder, will cause the holder and die and the surrounding housing to advance upon the pipe, the pitch of the thread being cut corresponding to that of the sleeve 13. This operation is continued until the thread has been cut for sufficient length, the bolts 9 allowing for enough travel, when the die may be reversed and the pipe withdrawn. The construction and arrangement of the parts is very strong and compact, while the worm-gearing gives great power, and a thread may be cut in a comparatively short time in a very perfect and accurate manner.

The construction of the gripping-jaws and the centering-bushing insure perfect alignment, and when the machine is adjusted for the desired thread a large amount of work can be done rapidly and accurately.

The advantages of my invention will be appreciated by those skilled in the art, and it is especially adapted for such work as laying pipe-lines in a trench, &c., where the threads may be cut without removing the pipe, the machine being comparatively light and portable and easily operated by one man.

Changes and modifications may be made in its construction by the skilled mechanic without departing from my invention, as I do

not desire to be limited to the exact construction shown in the drawings.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A screw-cutter comprising a central base, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base, substantially as set forth.

2. A screw-cutter comprising a base with a central opening therethrough, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base provided with a central hollow extension passing through the base, substantially as set forth.

3. A screw-cutter comprising a base with a central opening therethrough, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base provided with a central hollow threaded extension passing through the base, with a nut secured to the base and engaging such threaded extension, substantially as set forth.

4. A screw-cutter comprising a base with a central opening therethrough, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base provided with a central hollow threaded extension passing through the base, a two-sided divided nut pivotally secured to the base and engaging the threaded extension, with means for closing the nut upon the threaded extension, substantially as set forth.

5. In combination with a base and a rotatable die-holder movably mounted thereon; the gripping-vise comprising arms pivoted to the base, gripping-jaws pivoted to the arms, a clamp-arm pivoted to one of the arms and gripping-jaws, and having a temper-screw bearing against the other jaw, substantially as set forth.

6. In combination with a central base, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base provided with a central hollow threaded extension passing through the base; a divided hinged nut pivotally secured to the base composed of two independently-movable separable threaded halves designed to embrace the threaded extension, substantially as set forth.

7. In combination with a central base, a pair of gripping-jaws mounted on swinging arms hinged to the base, and a rotatable die-holder movably mounted upon the base provided with a central hollow threaded extension passing through the base; a divided

hinged nut pivotally secured to the base composed of two independently-movable separable threaded halves designed to embrace the threaded extension, and provided with means for closing the threaded halves upon the threaded extension, substantially as set forth.

8. In combination with a base and a pair of gripping-jaws pivotally mounted thereon; a housing movably mounted on the base, a rotatable die-holder inclosed in the housing provided with worm-teeth on its periphery and a worm-gear meshing therewith, mounted in the housing and provided with a power-shaft, substantially as set forth.

9. In combination with a rotatable die-holder having a circular depressed cavity for the die, adjustably mounted on a base, and means for rotating the die-holder, and a rectangular die mounted therein; segmental holding-blocks provided with a curved face corresponding to the interior edge of the cavity, and a straight face bearing against the edge of the die, with means for securing the blocks to the depressed face of the die-holder, substantially as set forth.

10. In combination with a rotatable die-holder having a circular depressed cavity for the die, adjustably mounted on a base, and means for rotating the die-holder; the adjustable die composed of divided semicircular bases, thread-cutters mounted therein, a cam-plate mounted on the die-holder provided with cam-grooves engaging bolts in the bases, substantially as set forth.

11. In combination with a rotatable die-holder having a circular depressed cavity for the die, adjustably mounted on a base, and means for rotating the die-holder; the adjustable die composed of divided semicircular bases, thread-cutters mounted in suitable transverse grooves, and lugs provided with pointed set-screws bearing in regularly-spaced holes in the thread-cutters, a cam-plate mounted on the die-holder provided with cam-grooves engaging bolts in the bases, and means for securing the parts together and to the die-holder, substantially as set forth.

12. In combination with a rotatable die-holder having a circular depressed cavity for the die; a circular plate provided with a cutter mounted in an adjustable slide having a threaded lug engaged by a temper-screw mounted in the circular plate, with means for securing the plate to the die-holder, substantially as set forth.

In testimony whereof I have hereunto set my hand this 1st day of August, 1896.

WILLIAM E. MELHORN.

Witnesses:

JOHN L. RALPH,
C. M. CLARKE.