L. F. HART.

WORK HOLDING MEANS FOR SCREW THREADING DEVICES.

APPLICATION FILED FEB. 18, 1909.

935,107.

Patented Sept. 28, 1909.

2 SHEETS—SHEET 1.

Fig 1

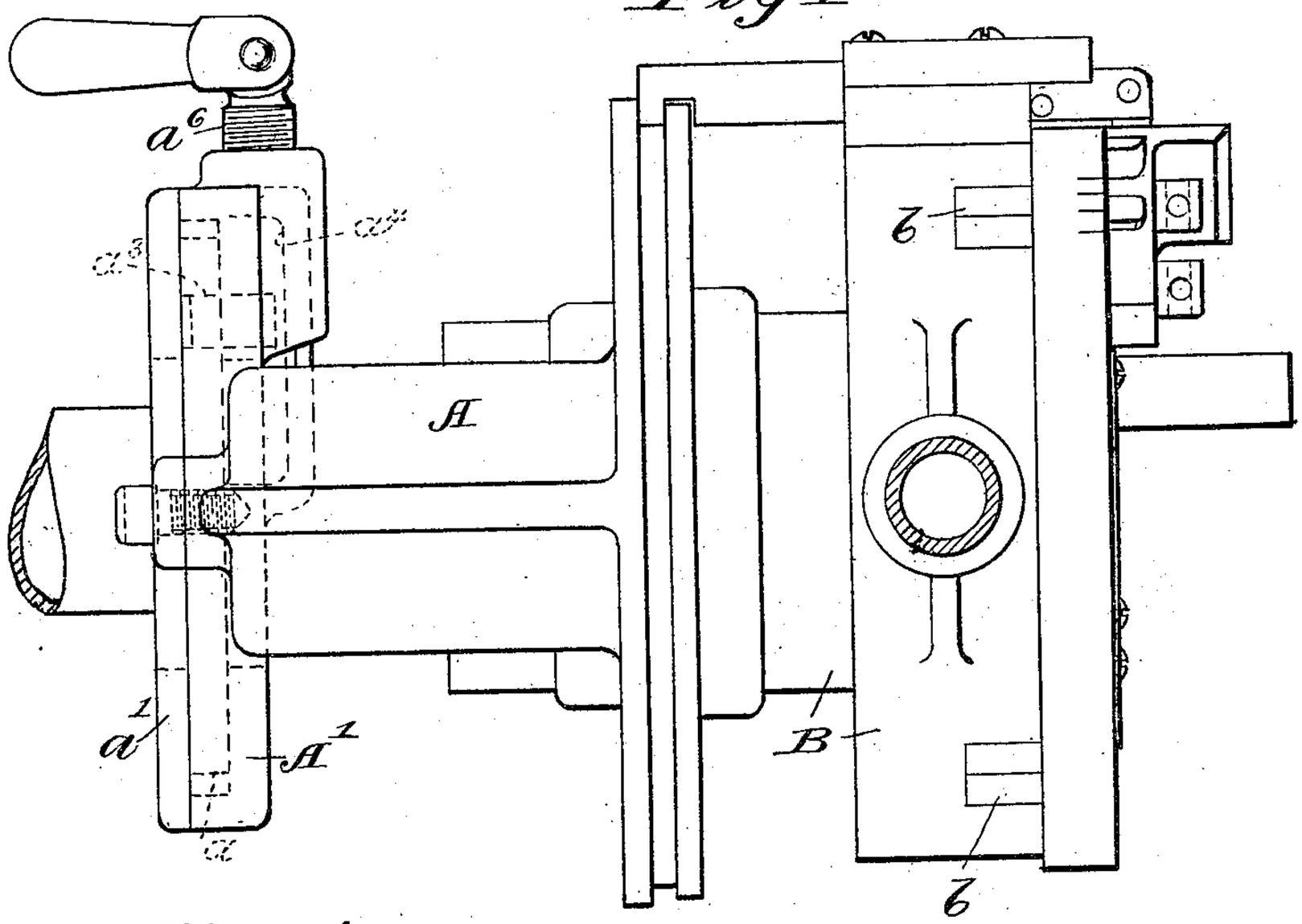


Fig. 4

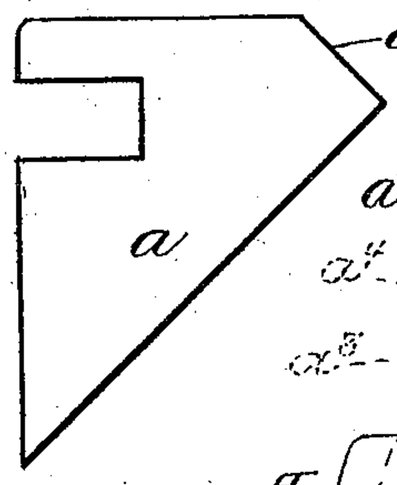


Fig. 2

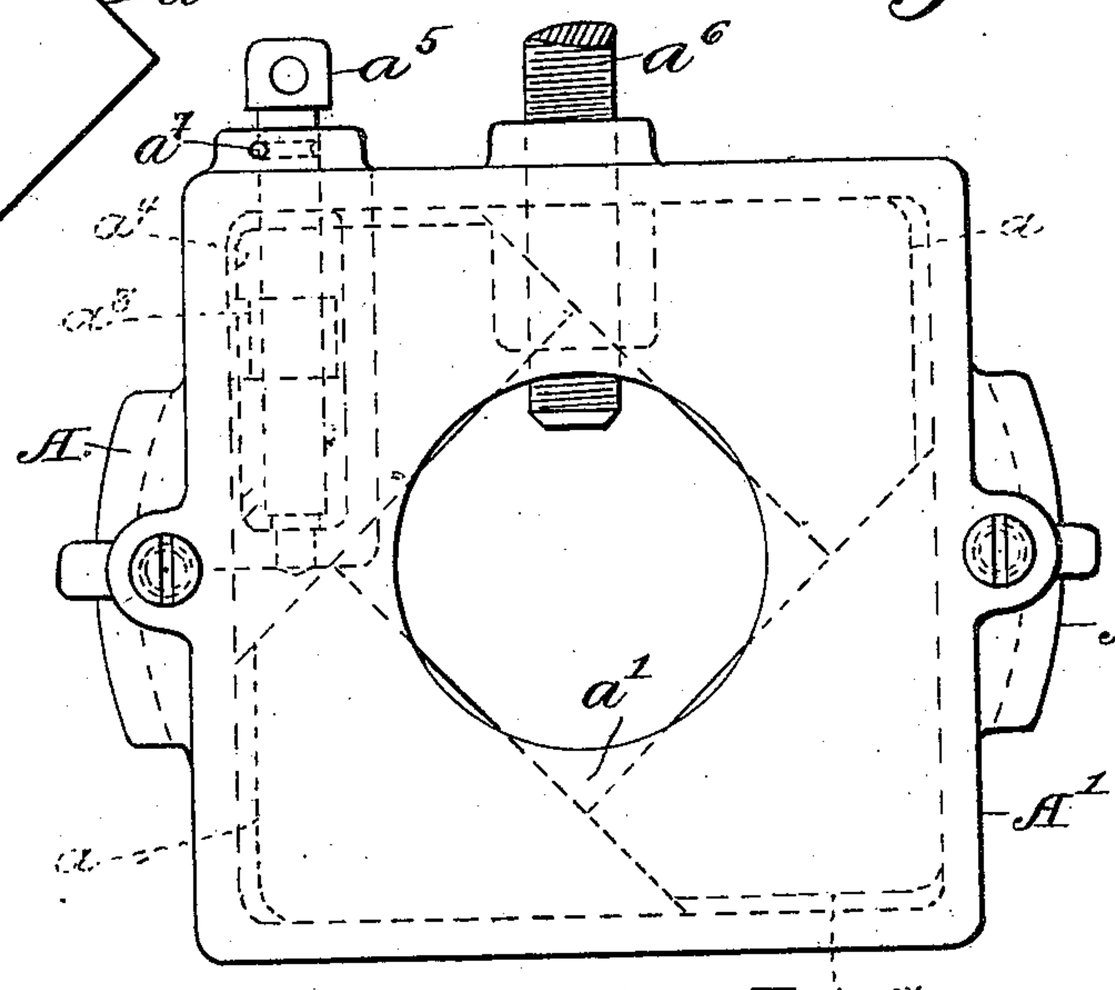


Fig. 5

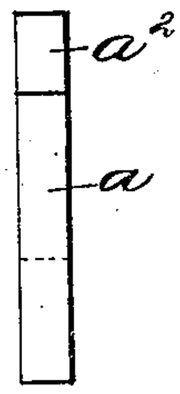
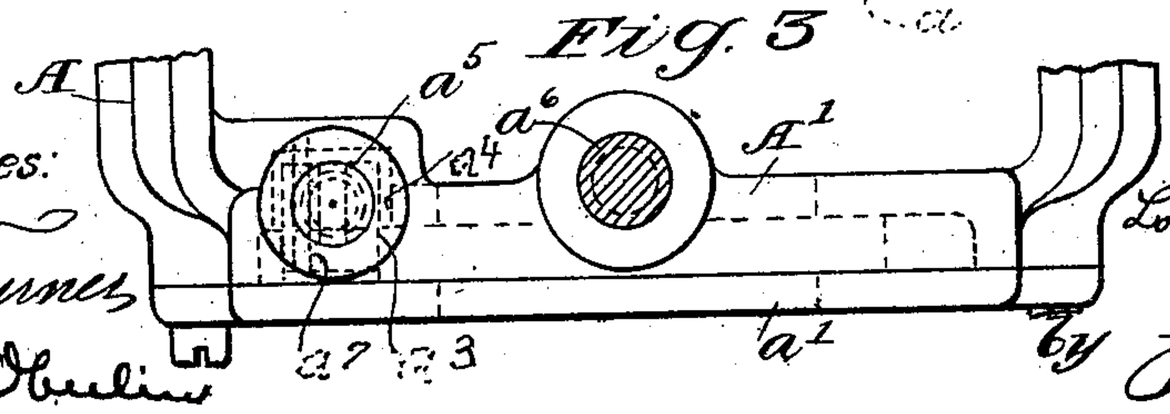


Fig. 3



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2 SHEETS—SHEET 2.

Fig. 6

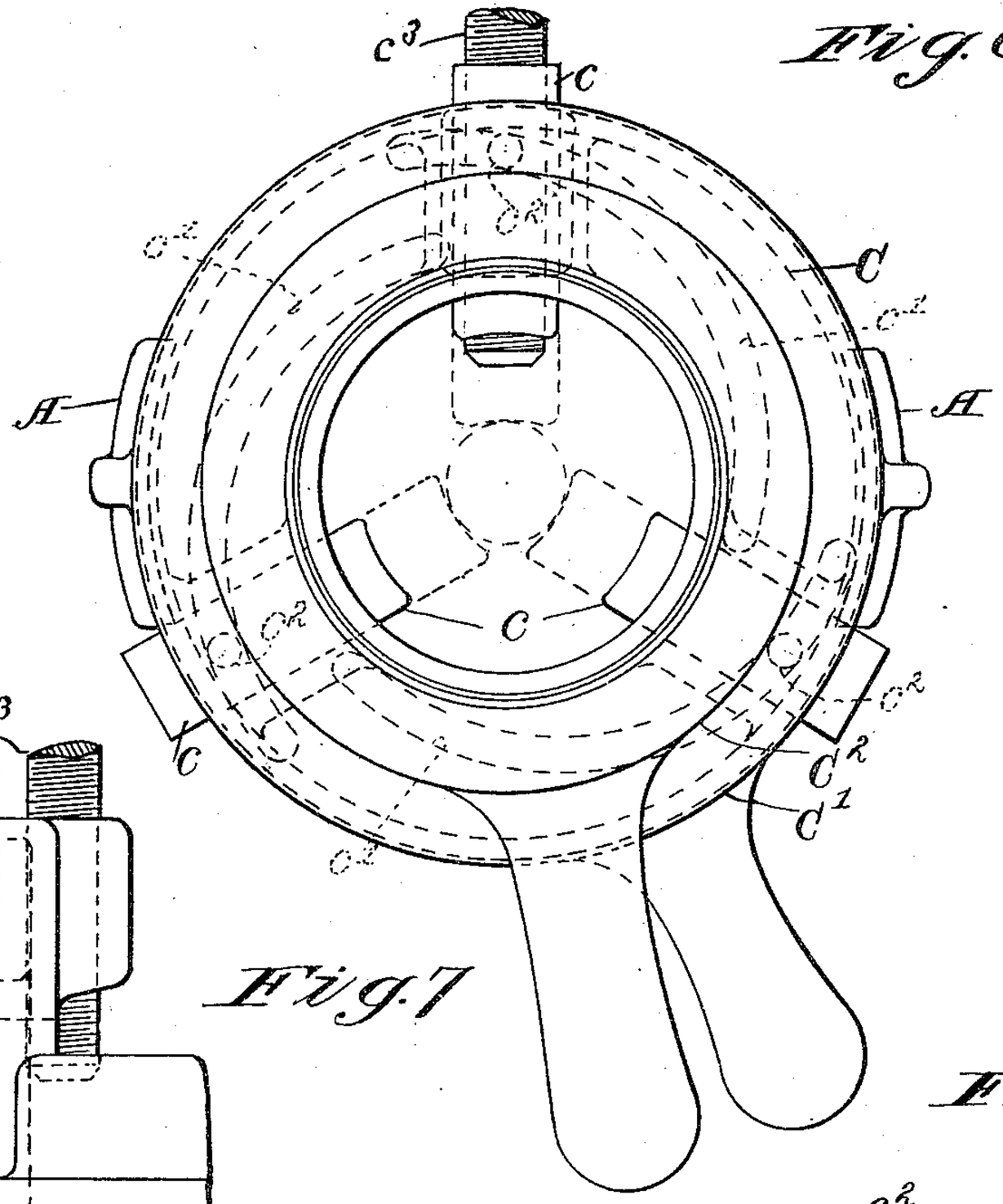


Fig. 7

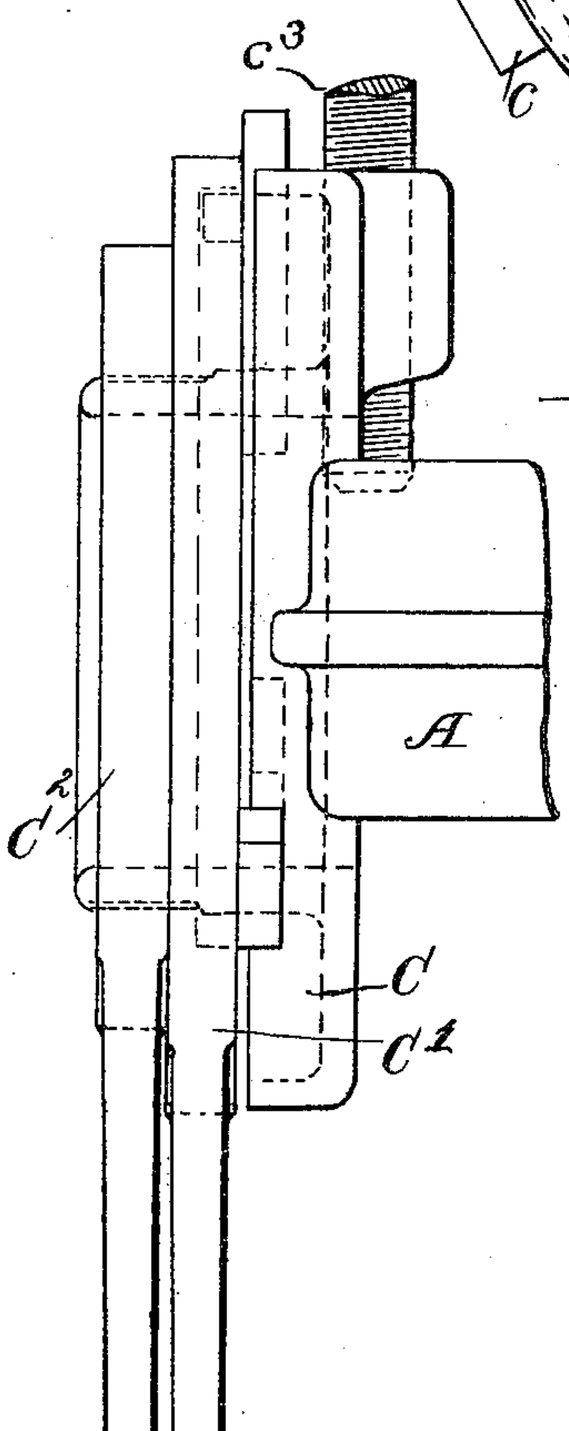


Fig. 9

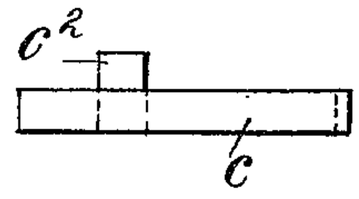
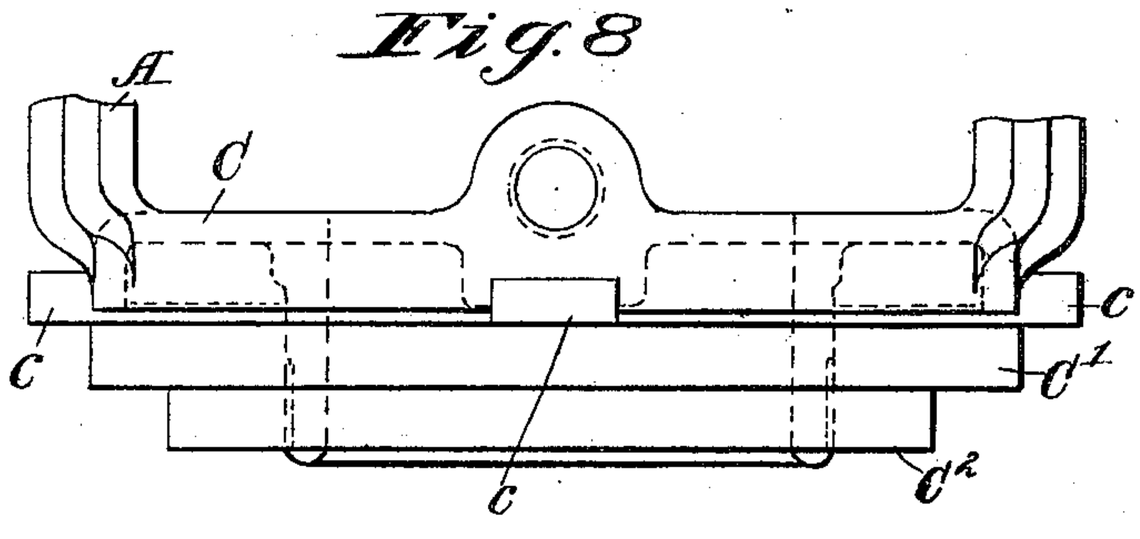


Fig. 8



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UNITED STATES PATENT OFFICE.

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WORK-HOLDING MEANS FOR SCREW-THREADING DEVICES.

935,107. Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed February 18, 1909. Serial No. 478,663.

To all whom it may concern:

Be it known that I, LOUIS F. HART, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Work-Holding Means for Thread-Cutting Devices, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

In die stocks and analogous forms of screw cutting devices, wherein the work-holding member and die-head are found associated as parts of a unitary structure, accommodation of the tool or the machine, as the case may be, to use on different sizes of pipe, or other work to be threaded, is commonly effected by the use of bushings adapted to be inserted in the aperture provided for the reception of the work in the work-holding member. The latter is usually the stationary member of the tool, either being secured to the work and such work secured to an external support, or else said member is itself directly attached to an external support.

The object of the present invention is the provision of an improved form of work-holding device particularly designed for use in the connection noted, although not necessarily limited thereto, which device combines with ease of adjustment and security in retaining the work, means for depressing the work slightly out of line with the axis of the tool, so as to permit the cutting of a "drip" thread when desired.

To the accomplishment of these and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:—Figure 1 is a side elevation of a die stock, showing in connection therewith one form of my improved work-holding device; Fig. 2 is an end elevation of such work-holding device; Fig. 3 is a plan view thereof; Figs. 4 and 5 respectively show a plan and end elevation of one of the centering slides, or jaws, of the device; while Figs. 6, 7 and 8 are respectively a front and side elevation, and a plan view of a modified form of my work-holding device; and Fig. 9 an elevation of a centering jaw such as is used therein.

Referring first of all to the form of the device illustrated in Figs. 1 to 5 inclusive, the tool, specifically a die-stock, as has been stated, will be seen to be made up of two main members; a work-holding member A, and a die-holding member, or head, B that is revolubly mounted in said work-holding member. In the device as shown, said head is independently longitudinally and rotatably thus movable, but it may also be threaded therein as in certain prevailing types of construction, without affecting the operation of the stock-holding device, which alone forms the subject matter of present interest. The details of the construction of the head need hence not be further noted than to remark the use therein of radially adjustable die-blocks *b* for cutting the threads on the work. The work-holding device proper then comprises a rectangular frame A′ at the rear end of member A, within which frame a plurality of jaws *a* are slidably held by means of a cover plate *a′*. These jaws, or slides, are of general triangular conformation, but corresponding corners of each slide are cut away at an oblique angle as at a^2 to conform with the contacting face of the adjacent slide. As a result of this arrangement, it will be obvious that transverse movement of any one of said slides will produce a corresponding movement of all the remaining slides. If, hence, the sum of the central angles of the slides be equal to 360 degrees, they will always have a common center with straight boundaries and perfectly inclosed sides, whereby a central aperture is secured, that while variable in size always remains symmetrical. For positively effecting the adjustment of the slides to thus vary the size of the central aperture, formed thereby as just stated, one of said slides is slotted (see Figs. 4 and 5) to receive a nut a^3 that is slidably held to move in the same direction as said slide in a recess a^4 adjacent the latter's inner face. Movement of this nut, secured by rotation in one direction or the other by a capstan headed screw a^5 that is threaded therein and held against longitudinal movement in frame

A′ by a pin a^8, serves to impart a corresponding movement to the slide, and thence in the fashion already explained, to the remaining slides of the set. By simply rotating accordingly such adjusting screw, the slides may be easily and readily brought to close up around a pipe of any size within the range of the tool. It is not necessarily contemplated, however, that such closure shall be of a firmness sufficient alone to retain the work against rotation, although it is possible to construct the device so as to achieve this result. As herein employed, however, such slides serve simply as centering, or rather as alining, means that grip more or less tightly the pipe, but the latter is more firmly secured or clamped so as to assure its being held against rotation, by means of an independent clamping device, consisting of a handled set-screw a^6 threaded in the upper portion of the frame, so as to be disposed in line with the bisector of the inner angle formed by two of such slides. Accordingly when the work has been properly centered by bringing the slides together thereon, the clamping operation is completed by giving one or more turns to the set-screw.

Since frequently in steam-fitting work it is necessary that a line of pipe incline at a slight downward angle, the threads on such pipe require to be cut slightly off the line of the pipe, thus giving what is called a "fall", or "drip" to the pipe. For this reason such threads are often called "drip" threads by the trade. My improved work-holding device as just described, is admirably adapted for the production of such inclined or "drip" threads, and that to, so as to incline a predetermined amount, and not an amount dependent upon approximation or guess work as heretofore. For by not quite closing the centering jaws upon the work, it will be obvious that the pipe being threaded will be correspondingly displaced from the center at the point where it is held in the work-holding member, when the clamping screw is applied, whereas the dies b in the die-holding member B will, of course, be accurately centered, and correspondingly hold the end of the pipe. It is a matter, hence, of precise adjustment to secure any desired amount of drip.

In the modified construction of the device illustrated in Figs. 6 to 9, I use instead of the triangular slides, a set of radially adjustable jaws c of familiar construction, adjustment of which either inwardly or outwardly is secured by means of a cam-plate C′ rotatably mounted upon the frame C in which said jaws are held, said plate being provided with eccentric grooves c' engaging pins c^2 on the jaws, Fig. 9, as will be readily understood. To lock said plate and thus the jaws, when once they are in desired position, a second plate C^2 is threaded onto a projecting portion of the frame, so that by drawing the same upon the cam-plate C′, the latter is held against rotation. As before, I employ in conjunction with the jaws, the position of which is determined in the manner just described, an independent clamping device in the form of a set-screw c^3 symmetrically disposed with respect to two of the jaws c so that the same accuracy of adjustment may be secured for the cutting of the drip threads as in the case of the first described form of the device.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A work-holding device, comprising a frame, a plurality of triangular slides mounted in said frame and forming jaws for centering the work; means for transversely adjusting said slides whereby a variable central aperture is formed, and a set screw in line with the bisector of the angle formed by two of said slides and adapted to clamp the work against the same.

2. A work-holding device, comprising a rectangular frame, a plurality of triangular slides mounted in said frame and forming jaws for centering the work, an adjusting screw connected with one of said slides to positively position the same and therethrough to position the remaining slides, whereby a variable central aperture is formed, and a set screw in line with the bisector of the angle formed by said two slides and adapted to clamp the work against the same.

3. In a screw-cutting device, the combination with a work-holding member including a plurality of jaws, means for simultaneously moving said jaws inwardly or outwardly to center the work, and independent means for clamping said work; of a die-holding member rotatably and longitudinally movable in said work-holding member.

4. In a screw-cutting device, the combination with a work-holding member, of a die-holding member rotatably and longitudinally movable therein, said work-holding member comprising a frame, a plurality of triangular slides mounted in said frame and forming jaws for centering the work, an adjusting screw connected with one of said slides to positively position the same and therethrough to position the remaining slides, whereby a variable central aperture is formed, and a set screw, in line with the bisector of the angle formed by two of said slides, adapted to clamp the work against the same.

5. In a screw-cutting device, the combination with a work-holding member, of a die-holding member rotatably and longitudinally movable therein, said work-holding member comprising a rectangular frame, a plurality of triangular slides mounted in said frame and forming jaws for centering the work, an adjusting screw connected with one of said slides to positively position the same and therethrough to position the remaining slides, whereby a variable central aperture is formed, and a set screw, in line with the bisector of the angle formed by two of said slides, adapted to clamp the work against the same.

Signed by me this 15th day of February, 1909.

LOUIS F. HART.

Attested by—
ANNA L. GILL,
JNO. F. OBERLIN.