No. 834,454. PATENTED OCT. 30, 1906.

B. BORDEN.

ADJUSTABLE DIE STOCK.

APPLICATION FILED FEB. 9, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

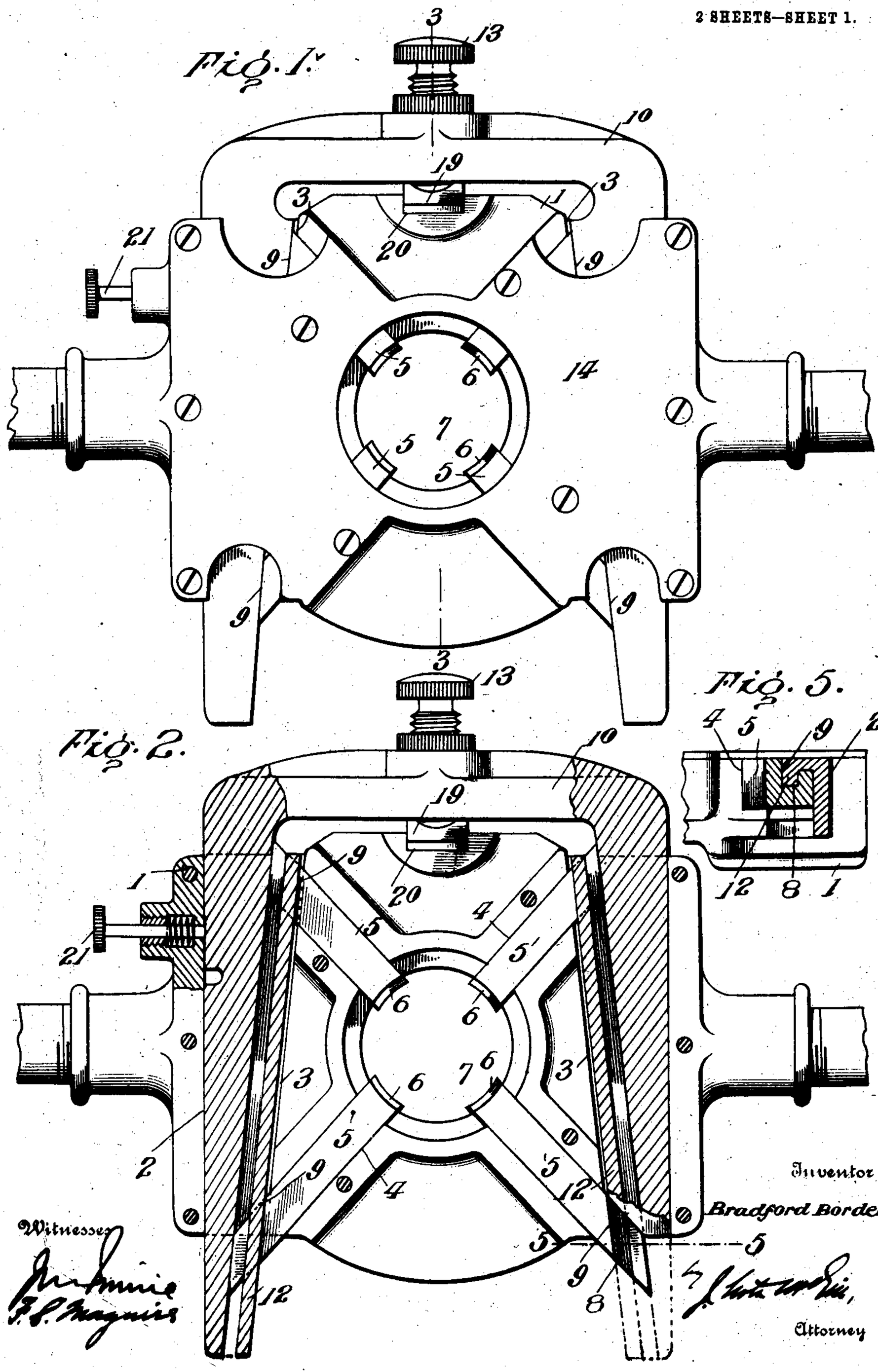

Fig. 2.

Fig. 5.

Witnesses:

Inventor

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2 SHEETS—SHEET 2.

Fig. 3.

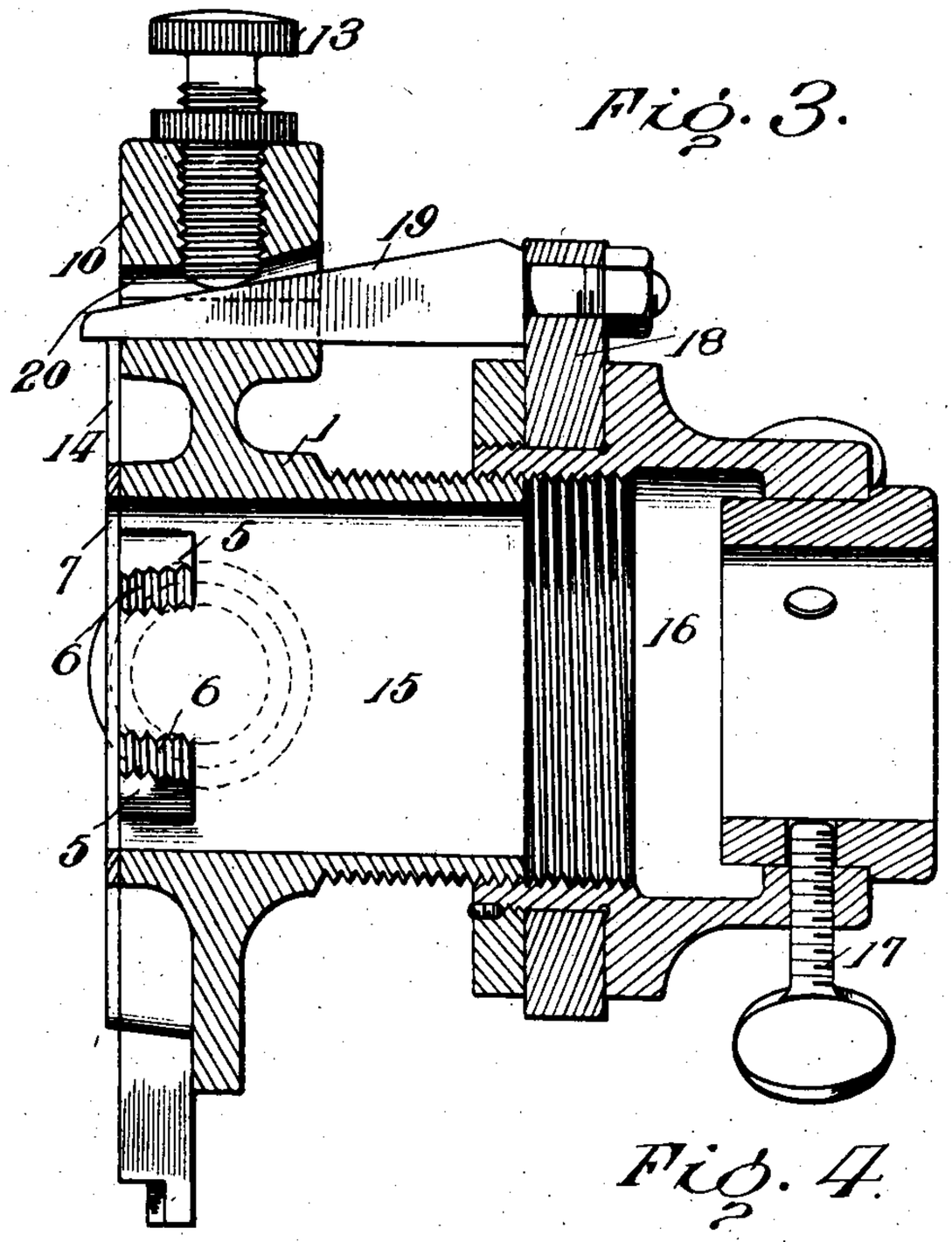
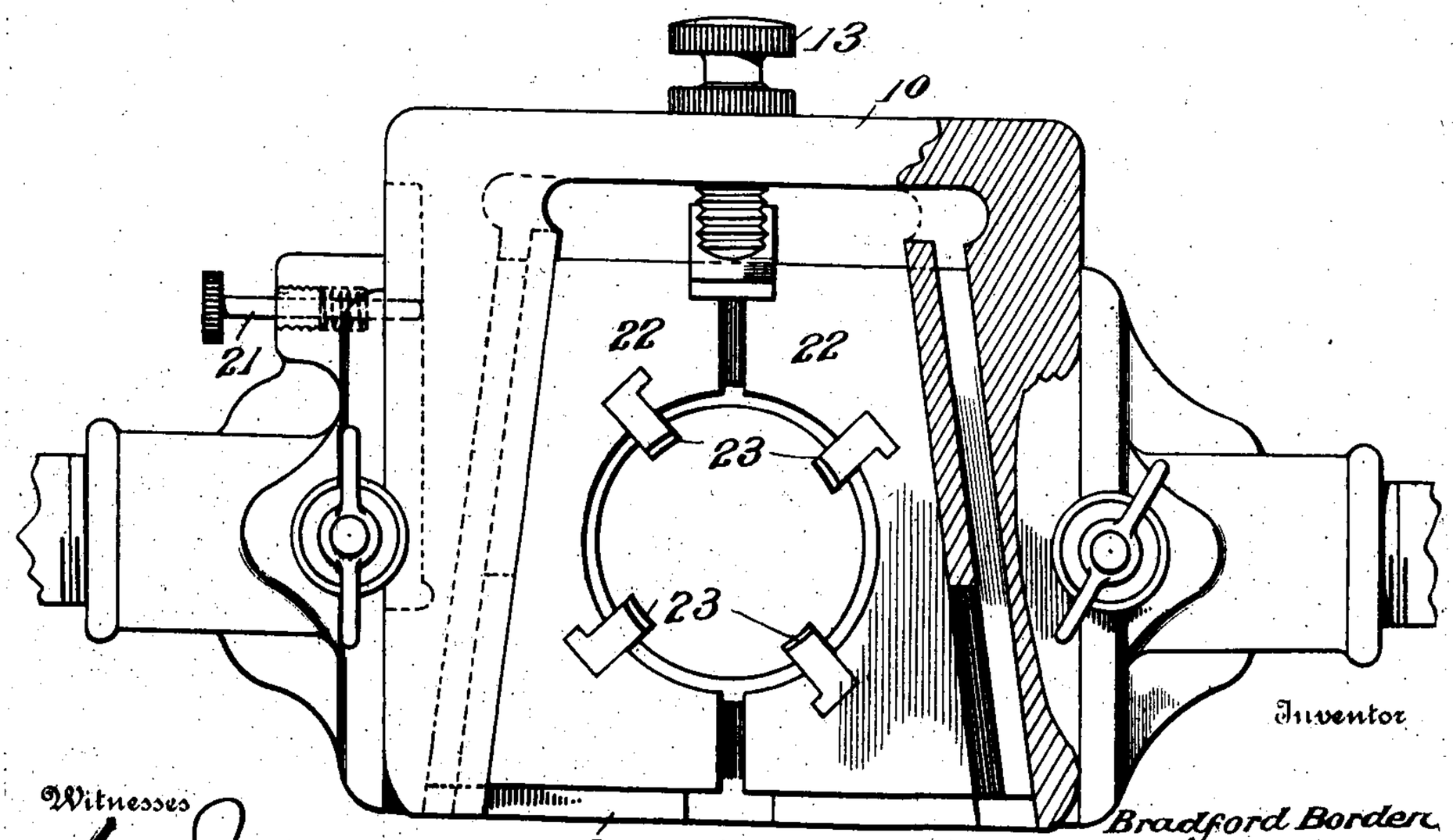


Fig. 4.



Witnesses

Francis C. Sayre

Inventor

Bradford Borden

By,

Attorney

UNITED STATES PATENT OFFICE.

BRADFORD BORDEN, OF WARREN, OHIO, ASSIGNOR TO THE BORDEN COMPANY, OF WARREN, OHIO, A CORPORATION OF OHIO.

ADJUSTABLE DIE-STOCK.

No. 834,454. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed February 9, 1905. Serial No. 244,933.

To all whom it may concern:

Be it known that I, BRADFORD BORDEN, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Adjustable Die-Stocks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

It has heretofore been sought to produce tapered threads on pipes and other metal bodies by means of radially-movable chasers which gradually recede from the pipe as the threading operation progresses; but so far as I am aware it has not been possible in such devices for one set of chasers to operate on pipes of different sizes nor to regulate the depth of the cut on any one size of pipe.

The object of my invention is to provide an adjustable die-stock having means for adjusting the chasers so as to regulate the depth of the cut or accommodate pipes of different sizes and at the same time effect the cutting of tapered threads.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation. Fig. 2 is a front elevation with the front plate removed and with parts in section. Fig. 3 is a vertical longitudinal sectional view on line 3 3, Fig. 1. Fig. 4 shows the application of my present improvements to a die-stock having sectional dies carrying the chasers. Fig. 5 is a section on line 5 5, Fig. 2.

Referring to the drawings, 1 designates the body or housing, having parallel end walls 2 and inclined walls 3, the latter being inclined toward each other. Within radially-arranged guideways 4 are located chasers 5, having tapered cutting-threads 6 on their inner ends. These chasers all radiate from the center of opening 7, wherein the pipe to be threaded is located. At their outer ends they are cut away and formed with grooves 8 and inclined walls 9, these latter conforming to the incline of walls 3 of the housing.

10 designates an adjuster of the type covered by Letters Patent of the United States No. 744,465, issued to me November 17, 1903. It is shown in the form of a frame composed of corresponding side members and a connecting portion, said side members having outer straight sides to conform to the walls 2 of the housing and inner inclined sides to conform to the inclined walls 3 of such housing and also to the inclined walls 9 of the chasers. These side members have overlapping portions carrying tongues 12, which interlock with the grooves 8 of the chasers, said tongues being extended the full length of the side members. The connecting portion of the adjuster carries a set-screw 13 for limiting the inward movement of the adjuster and to permit the latter to be so set that the chasers will accomodate pipes of different sizes or effect the cutting of threads of different depths, such set-screw rendering readjustment unnecessary while the device is used in further cutting at the same gage. It will be observed that the adjuster engages each of the chasers, with the result that by turning the set-screw 13 or otherwise moving the adjuster the several chasers will be simultaneously adjusted toward or away from the center opening of the housing. A covering-plate 14 is secured to the front of the housing and serves to retain the chasers in their guideways; as well as to prevent forward deflection of the adjuster. Other means may be employed for this purpose.

From the rear of the housing extends a sleeve 15, which I have shown as exteriorly threaded, so as to fit or telescope in the interiorly-threaded tubular body of the frame or work-holder 16, having set-screws 17 for centering the pipe and clamping the work-holder thereto. It is manifest, however, that any suitable means may be employed for holding the work-holder, as when the device is employed on a power-machine it is held in a vise. Axially mounted on the tubular body of the work-holder 16 is a collar 18, in a projection whereof is secured one end of a wedge 19, which projects forwardly into a groove 20, formed in the frame of the housing and designed to extend transversely beneath set-screw 13 of the adjuster. As the housing is revolved around the pipe and works inwardly toward the work-holder the wedge will be caused to project beyond the connecting portion of the adjuster. In consequence of the engagement therewith of the set-screw 13 the adjuster gradually moves

outwardly as the housing travels inwardly, the adjuster carrying with it the several chasers. In this way I am enabled to form a tapered thread without leaving a bur at the inner end thereof.

It is manifest that before beginning the cutting operation the several chasers may be simultaneously adjusted by the turning of set-screw 13, which by reason of its engagement with the wedge will effect the movement of the adjuster. In this way I am enabled to set the chasers for pipes of different sizes and also to regulate the depth of the cut. Although I have specified the set-screw as having only contact engagement with the wedge, yet it is obvious that the same may be directly connected thereto by means which will permit the wedge to move transversely of the screw, the result being the same.

21 designates a spring-pressed pin extended through one of the side walls 2 of the housing and designed to automatically hold the adjuster in its outward position as the threading operation is completed, so that the several chasers will be kept out of engagement with the pipe as the stock is being returned to its starting-point.

In Fig. 4 I have shown my present improvement as applied to a die-stock having sectional die-blocks 22, carrying chasers 23, such die-blocks being inclined on their sides to conform to the inclined sides of the adjuster after the manner contemplated by my before-noted patent. In all other respects the invention is the same as hereinbefore disclosed, the adjuster being gradually moved outwardly during the cutting operation by the action of the wedge against set-screw 13, thereby gradually drawing the die-blocks apart as the cutting operation progresses.

The advantages of my invention are apparent. It will be seen that by means thereof I am enabled to readily adjust the chasers or die-blocks to regulate or control the depth of the thread before the cutting operation is commenced and that when once this adjustment is secured and the parts set for operation the chasers or die-blocks will be gradually moved outwardly during the cutting operation. It is also manifest that a die-stock having my present improvements may be employed for cutting threads on pipes of different sizes, this alone being a great desideratum. The advantage pointed out in my before-noted patent of having the sides of the adjuster fill the spaces between the inclined walls of the die-blocks or chasers and the straight walls of the housing is observed in each of the present instances.

I claim as my invention—

1. The combination with the frame having a tubular body, of the chasers, the housing therefor having a sleeve telescoping said tubular body, an adjuster for simultaneously moving all the chasers outwardly as the work progresses, and means rotatable with said housing for so moving the adjuster.

2. The combination with the frame having a tubular body, of the chasers, the housing therefor having a sleeve telescoping said tubular body, an adjuster for simultaneously moving all the chasers outwardly as the work progresses, a wedge rotatable with said housing for so moving the adjuster, and a rotatable ring fixedly held relatively to the frame, said wedge being secured to said ring.

3. The combination with a work-holder, of a rotatable die-stock movable toward and away from the work-holder, chasers mounted in the die-stock, a single element for moving all the chasers simultaneously, and means rotatable on said work-holder for so moving said chaser-moving element as the die-stock travels toward the work-holder as to gradually draw all the chasers outwardly.

4. The combination with a work-holder, of means rotatable on said holder, a rotatable die-stock movable toward and away from the work-holder, chasers mounted in the die-stock, means for simultaneously moving all the chasers outwardly as they travel toward the work-holder, means for adjusting such chaser-moving means and the chasers, and means mounted on said rotatable means for engaging and gradually moving said chaser-moving means outward as the die-stock travels toward the work-holder.

5. The combination with a work-holder, of a collar rotatably mounted thereon, a die-stock movable toward and away from the work-holder, chasers mounted in said die-stock, an adjuster for moving all of said chasers simultaneously, and means mounted on the collar for engaging said adjuster and gradually forcing it and the chasers outward as the die-stock approaches the work-holder.

6. The combination with a work-holder, of means rotatably mounted on said holder, a rotatable die-stock movable toward and away from the work-holder, an adjuster for moving all of said chasers simultaneously, a set-screw carried by said adjuster, and a wedging-block carried by said rotatable means engaging said set-screw for moving the adjuster and through it the chasers as the die-stock travels toward the work-holder.

7. The combination with the die-stock, of a support therefor, a series of radially-arranged chasers, an adjuster engaging each chaser for moving all of them simultaneously, a set-screw carried by said adjuster, a wedging-block engaging said set-screw and upon which the latter is designed to ride as the cutting operation progresses, and means for holding the wedging-block to permit the said screw to travel thereon as the die-stock moves at right angles to the plane of rotation

of said wedging-block during the cutting operation, said wedging-block and die-stock rotating in unison.

8. The combination with a die-stock having straight guides arranged transversely thereof, of expansible cutters, an adjuster movable in the guides and having means for engaging and moving the cutters inward, a work-holder, a wedge held against movement parallel with the axis of the work-holder but revoluble with respect thereto and arranged to engage the adjuster to move the same on the guides, substantially as described.

9. The combination with the work-holder, of a die-stock, the chasers, the adjuster for the latter, means for automatically moving the adjuster and the chasers as the work progresses, and means for holding said adjuster and through it the chasers at the outer limit of movement.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BRADFORD BORDEN.

Witnesses:

FRANK S. CHRYST,

JOHN R. LACHMAR.