H. W. OSTER.

DIE STOCK.

APPLICATION FILED APR. 26, 1909.

965,403.

Patented July 26, 1910.

2 SHEETS—SHEET 1.

Fig. 1

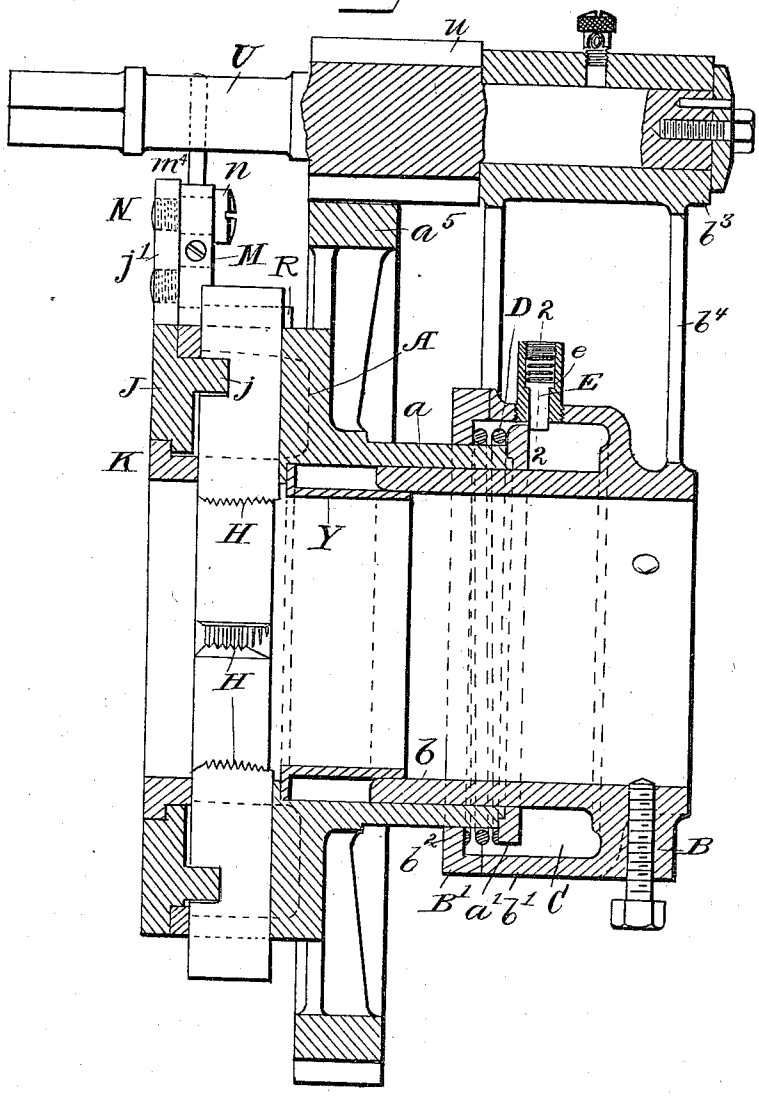
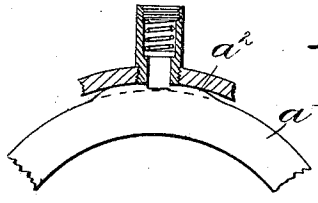


Fig. 2



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2 SHEETS—SHEET 2.

Fig. 3

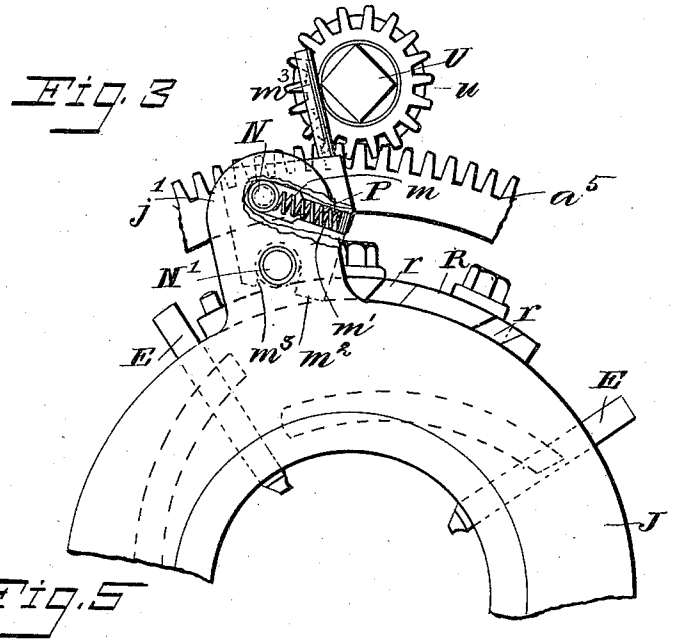
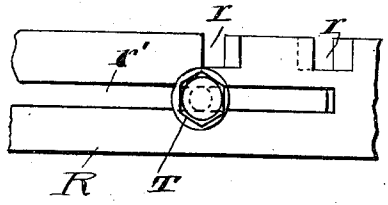


Fig. 5



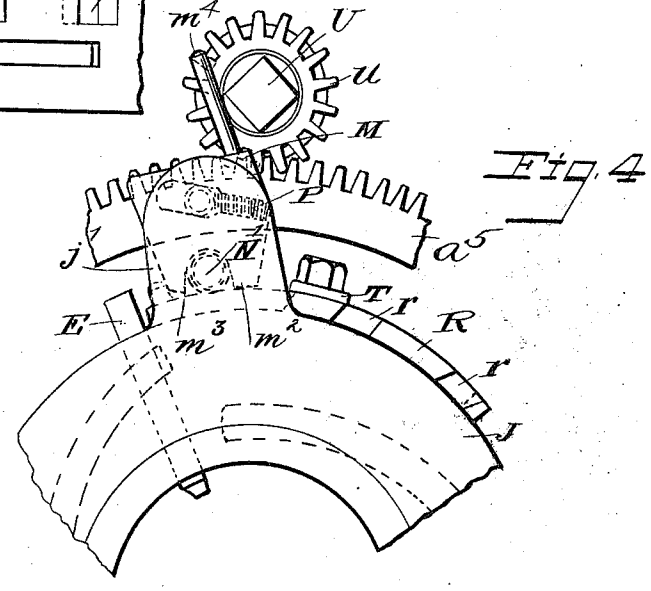


Fig. 4

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UNITED STATES PATENT OFFICE.

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DIE-STOCK.

965,403. Specification of Letters Patent. Patented July 26, 1910.

Application filed April 26, 1909. Serial No. 492,122.

To all whom it may concern:

Be it known that I, HERMAN W. OSTER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Die-Stocks, of which the following is a full, clear, and exact description.

This invention is adapted more especially for use in geared die stocks, although certain features of the invention are useful in die stocks which are not gear driven.

The primary invention is the described use of a spring for drawing the die head into the work holder to establish the lead.

Another feature of the invention is the described use of a cam plate latch which, when the thread is nearly finished, will be automatically knocked out of operative position and will then serve to so move the cam plate that the dies will gradually recede and cut a tapered thread.

The invention is shown in the drawing and hereinafter described and is definitely pointed out in the appended claims.

In the drawing, Figure 1 is a transverse longitudinal section of a die stock embodying the invention. Fig. 2 is a sectional view in the plane of line 2—2 on Fig. 1. Fig. 3 is an end view of that side of the die stock on which the latch is secured,—this figure showing the latch (for most part in dotted lines) in position to prevent the turning of the cam plate. Fig. 4 is a similar view showing, in dotted lines, the latch drawn back and serving, in connection with other features shown in this figure, to turn the cam plate to cause the dies to recede. Fig. 5 is a side view of a fragment of the locking plate R.

Referring to the parts by letters, A represents the tubular head or body of the tool which has a rearwardly extended barrel *a* which telescopes over the tubular cylindrical barrel *b* of the work holder B. This work holder has, in addition to said barrel, a concentric cylindrical barrel *b'* outside of the barrel and at a sufficient distance therefrom to leave between the barrel and the flange an annular chamber C. On the rear end of the barrel *a* is an outwardly extended flange *a'* having, for a short arcual distance, and on one side, a narrow projection a^2. This flange may be formed on or secured to the barrel *a*. A cap B' is secured to the front end of the flange *b'* and it is provided with an inwardly extended flange b^2, which overhangs the flange *a'*. D represents a helical spring which embraces the rear end of the barrel *a* in the annular recess C between the flanges b^2, *a'*. When the parts of the tool are in position to begin the work of cutting a thread they are in the relative position shown in Fig. 1 at which time spring D is compressed. At the same time the projection a^2 is in front of and engaging a spring pawl E mounted in the work holder and having a head *e* which limits its inward movement. The inner end of this plunger may go behind the projection a^2 of the flange *a'*, and is in that position, as shown in the drawing. When so engaged with said projection a^2 said pawl prevents the spring D from moving the die head rearwardly upon the work holder.

The dies E are mounted in radial guideways in the front end of the head A, wherein they are held by a cam plate J, which is mounted on the front end of the die head, and is held thereon by a flanged ring K fixed to said die head. The cam plate has scrolls *j* on its rear face which engage with the dies, wherefore the turning of said cam plate will move the dies in or out, as required. The cam plate has an outwardly extended arm *j'*, to the under side of which a latch plate M is movably secured by means of the head *n* of a stud N, which screws into the arm *j'* and goes through a slot *m* in the locking plate. A spring P in a spring-barrel *m'* formed in this plate is pressed between the end of that barrel and the stud N. This plate is formed with a locking toe m^2; and with a notch m^3 in the inner end of said plate. A stud N', screwed into the projecting arm *j'* passes through this notch. This toe m^2 is adapted to engage in any notch *r* in the front edge of a curved locking plate R, which is adjustably fixed to the side of the head, by means of a screw T, which passes through a slot *r'* in said plate R. A shaft U is mounted in bearings b^3 in the outer end of a laterally projecting arm b^4 of the work holder. Fixed to this shaft is a long pinion *u* which meshes with a gear a^5 fixed to the die head. The locking plate R is located adjacent to this shaft.

In using the described tool, the parts thereof are brought to the position shown in Fig. 1. Then the tool is passed over the end

of the pipe or cylindrical bar to be threaded until the end thereof is in engagement with the dies H. The work holder is then clamped to the work, which is generally held in a vise. The cam plate J is turned until the dies are moved, either out or in to bring them into proper position relative to the work. The plate R is moved to and secured in the proper position for the engagement of the latch plate in one of its notches. The latch plate is swung until its toe m' engages with said notch. Then, by means of a crank put upon shaft U said shaft is turned. Through this means the die head is turned until the projection a^2 passes beyond the spring plunger E. Thereafter the spring D will act to draw the die head rearward upon the work holder, and thereby establish the lead or cut of the die upon the work. This spring is preferably so short that it becomes inactive when the thread is well started.

When the head has been turned enough to have nearly finished cutting the thread an arm m^3 is inserted in a socket in the outer end of the plate. This arm, when it comes in contact with the shaft U, will cause the latch plate to be turned so as to withdraw its toe from the notch r. As the die head is further turned this engagement will cause the cam plate to stand still, and thereby as the head is turned the dies will be caused to recede and therefore finish the thread on a taper.

Y represents a tubular cylindrical chip shield, which is fixed to the die head. Its diameter and length is such that, as shown, it projects into and fits the barrel b, and an annular recess is formed between the barrel a and chip shield for the end of barrel b to move as the die holder moves rearward on the work holder. This chip shield keeps the chips made by cutting the thread from interfering with the working parts.

I claim—

1. In a die stock, the combination of a work holder having a cylindrical barrel and outside of that a cylindrical flange, a die head having a cylindrical barrel which telescopes over the barrel of the work holder and has at its inner end an outwardly extending annular flange, which flange has an outward projection which extends for a short arcual distance, a spring pawl carried by the work holder and adapted to be moved inward behind said projection, an inwardly projecting flange on the cylindrical flange of the work holder, and a spring compressed between said flange and the annular flange on the barrel of the die head.

2. In a die stock, the combination of a work holder, a head which telescopes with the work holder and is rotatable thereon, radially movable dies carried by said head, a cam plate rotatably mounted upon the head and having scrolls which engage with said dies and having an outwardly projecting ear, a notched locking plate adjustably secured to the die head, a latch plate mounted on said ear and having a toe adapted to engage with a notch in said locking plate, a knock off arm removably secured to said latch plate, and a part carried by said work holder with which said knock out arm may engage as the die head is turned relative to the work holder.

3. In a die stock, the combination of a work holder, a head which telescopes with the work holder and is rotatable thereon, radially movable dies carried by said head, a cam plate rotatably mounted upon the head and having scrolls which engage with said dies and having an outwardly projecting ear, a notched locking plate adjustably secured to the die head, a latch plate having a slot and having at its inner end a locking toe and adjacent thereto a notch, a stud passing through said slot and engaging with said ear and having on its under end a head engaging with said latch plate, a spring carried by said latch plate engaging said stud, and a second stud fixed to said ear and passing through the notch in the inner edge of said latch plate.

4. In a die stock, the combination of a work holder adapted to be secured upon the work and having a laterally extended arm, a driving shaft mounted in said arm and having secured to it a long pinion, a die head mounted upon the work holder for rotative and longitudinal movement, a gear fixed thereto and engaging with said pinion, dies mounted in said die head, a cam plate controlling their position, a latch plate mounted on the cam plate for preventing the turning of the cam plate, and a knock out arm removably secured to said latch plate and adapted to engage with said shaft, whereby the latch plate is moved to the unlatched position.

5. In a die stock, the combination of a work holder adapted to be secured to the work, a die head which telescopes over the work holder and is adapted to move longitudinally and to rotate relative thereto, and a cylindrical chip shield fixed to the die carrier and entering the tubular center of the work holder and engaging therewith.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

HERMAN W. OSTER.

Witnesses:

F. C. Bond,

R. B. Tewksbury.