

No. 626,634.

Patented June 6, 1899.

T. H. RYLANDS.

TOOL FOR TURNING HEADS OF CARTRIDGE SHELLS.

(Application filed Mar. 9, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

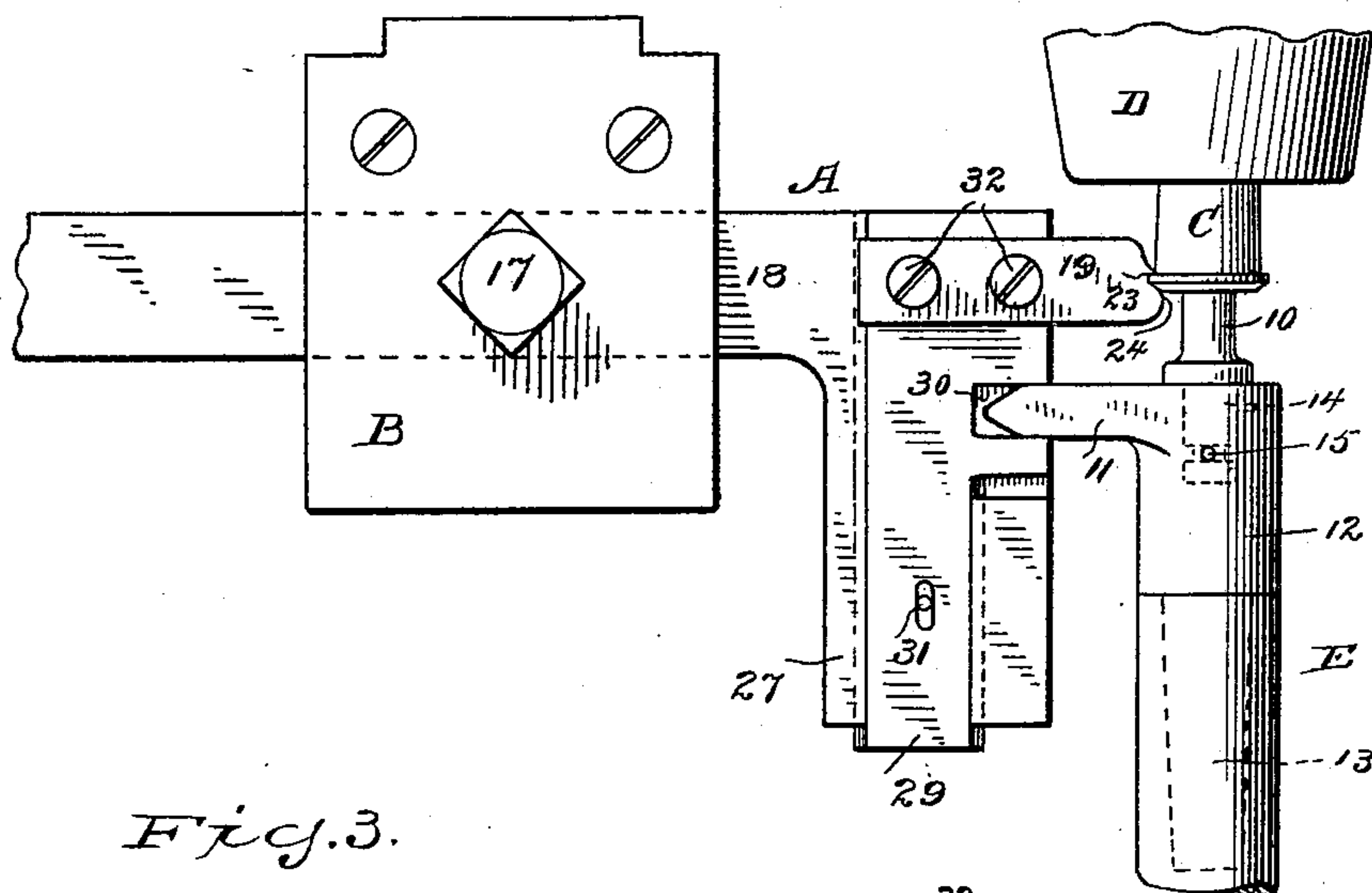


Fig. 3.

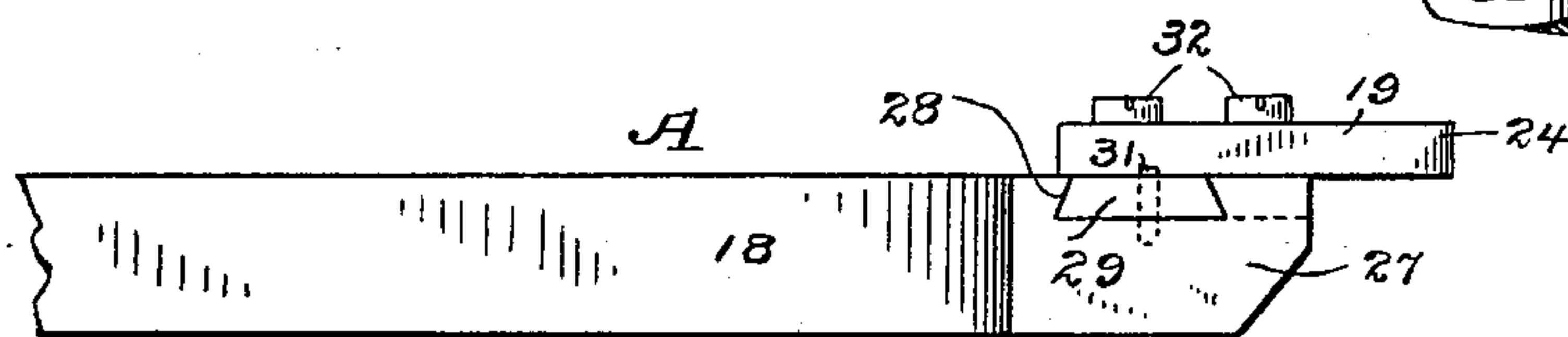
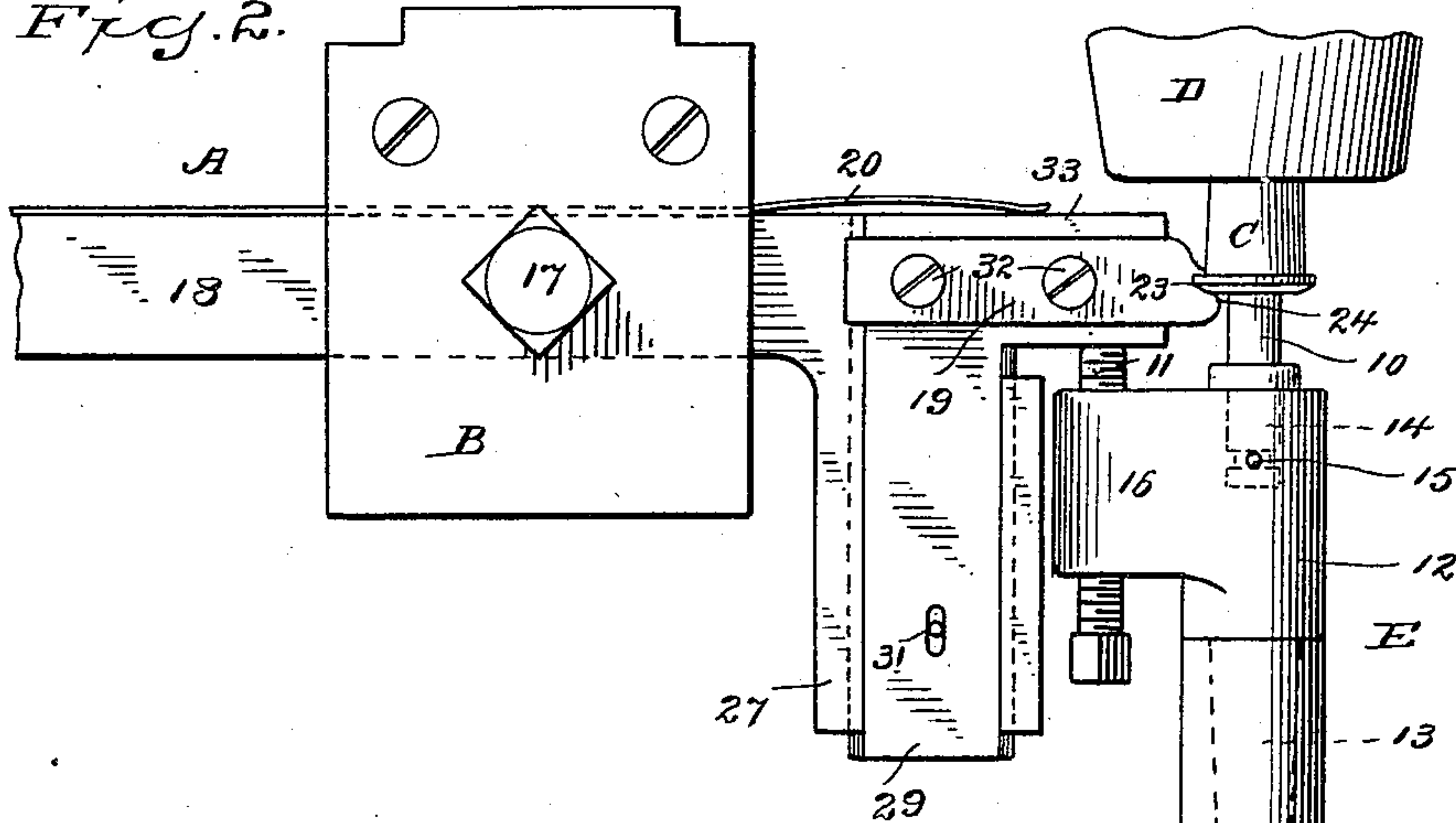


Fig. 2.



WITNESSES

H. A. Lamb  
S. P. Heley

INVENTOR

Thomas H. Rylands  
By A. M. Wooster  
Atty.

No. 626,634.

Patented June 6, 1899.

T. H. RYLANDS.

TOOL FOR TURNING HEADS OF CARTRIDGE SHELLS.

(Application filed Mar. 9, 1899.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 4.

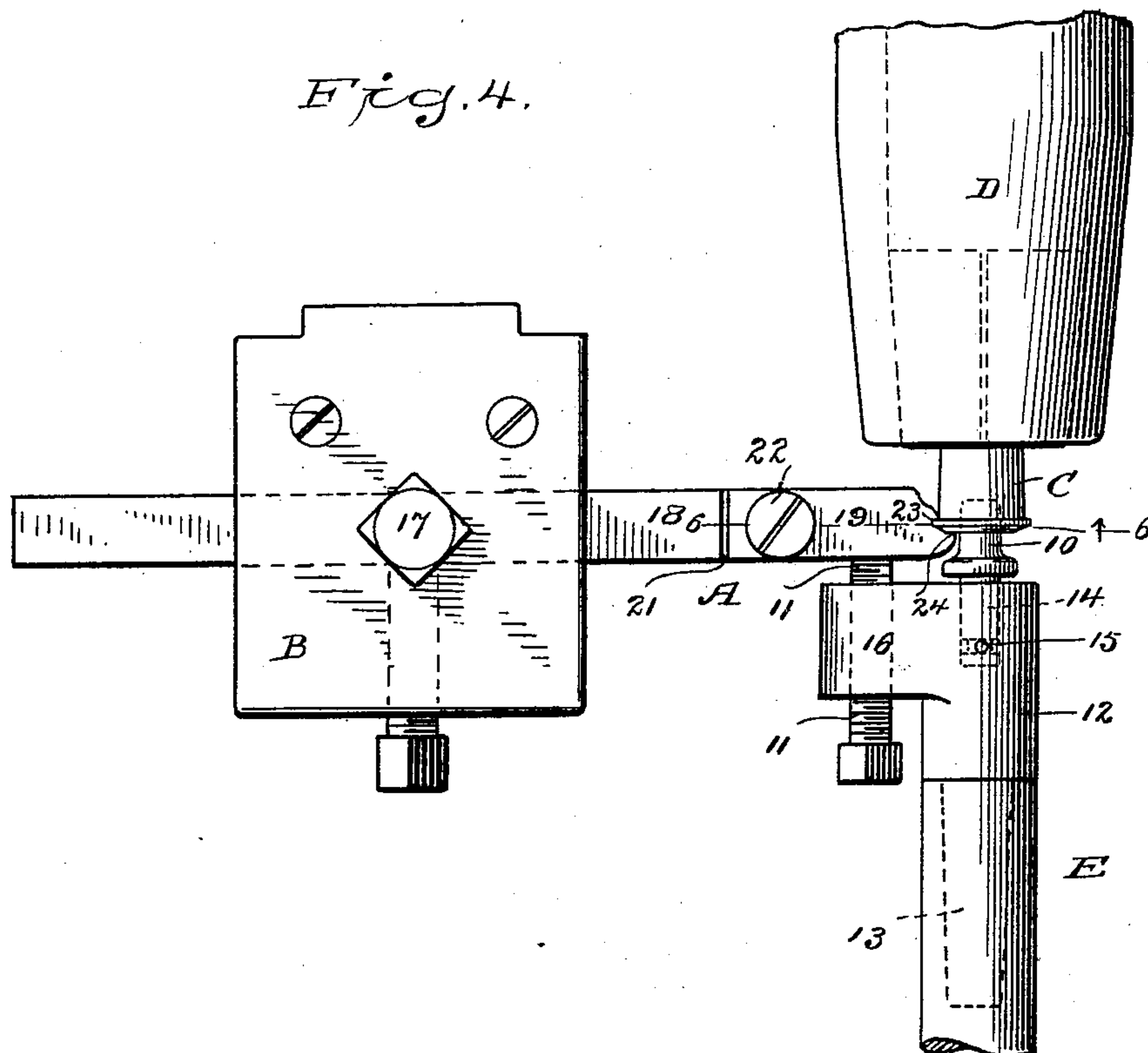


Fig. 5.

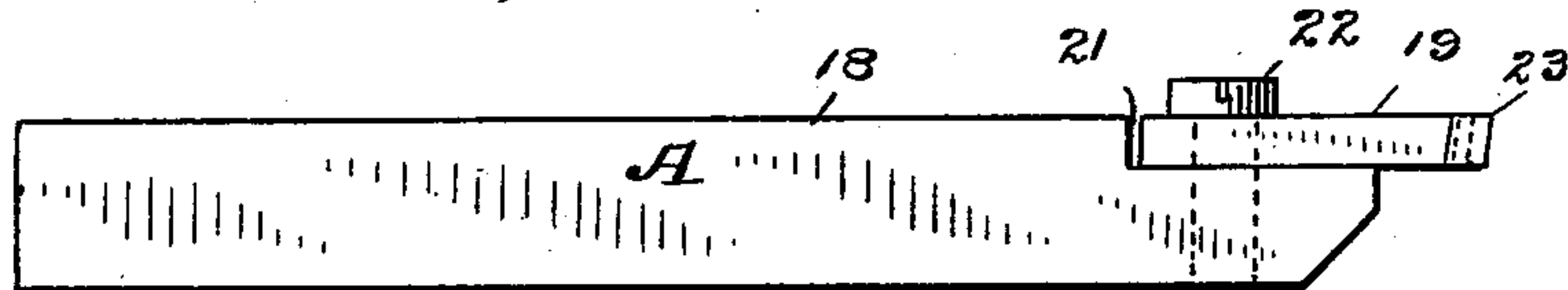


Fig. 6.

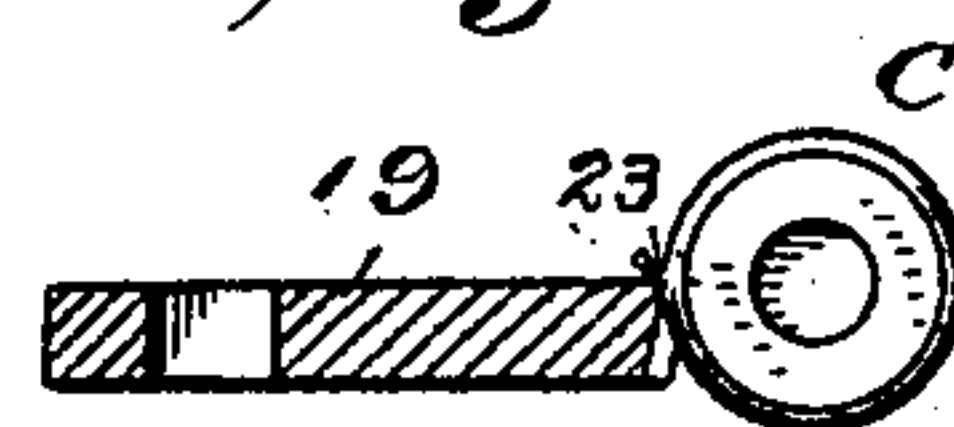


Fig. 12.

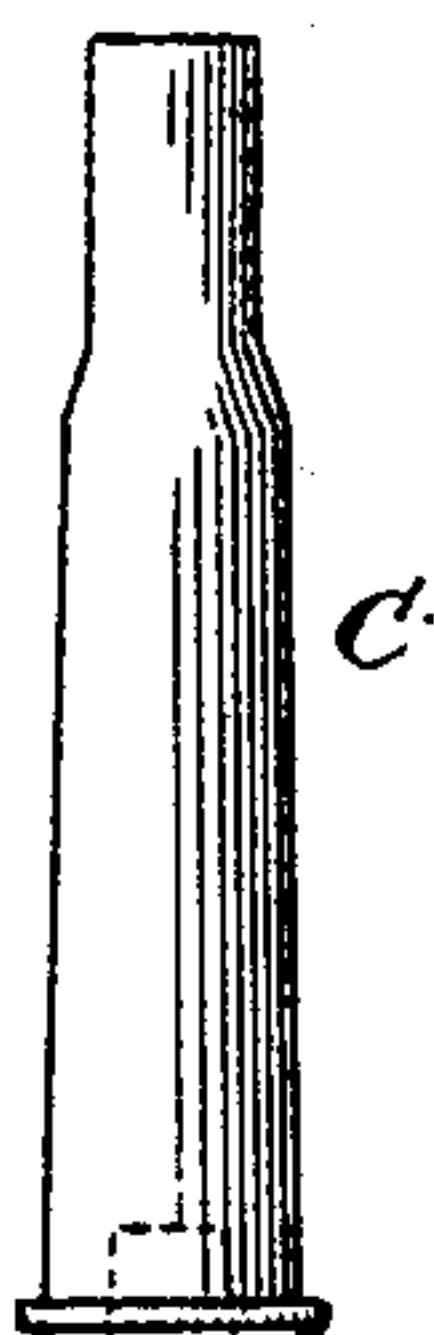


Fig. 13.



WITNESSES

H. A. Lamb  
S. V. Heley

INVENTOR

Thomas H. Rylands  
By  
A. M. Wooster  
Atty.

No. 626,634.

Patented June 6, 1899.

T. H. RYLANDS.

TOOL FOR TURNING HEADS OF CARTRIDGE SHELLS.

(Application filed Mar. 9, 1899.)

(No Model.)

3 Sheets—Sheet 3.

Fig. 7.

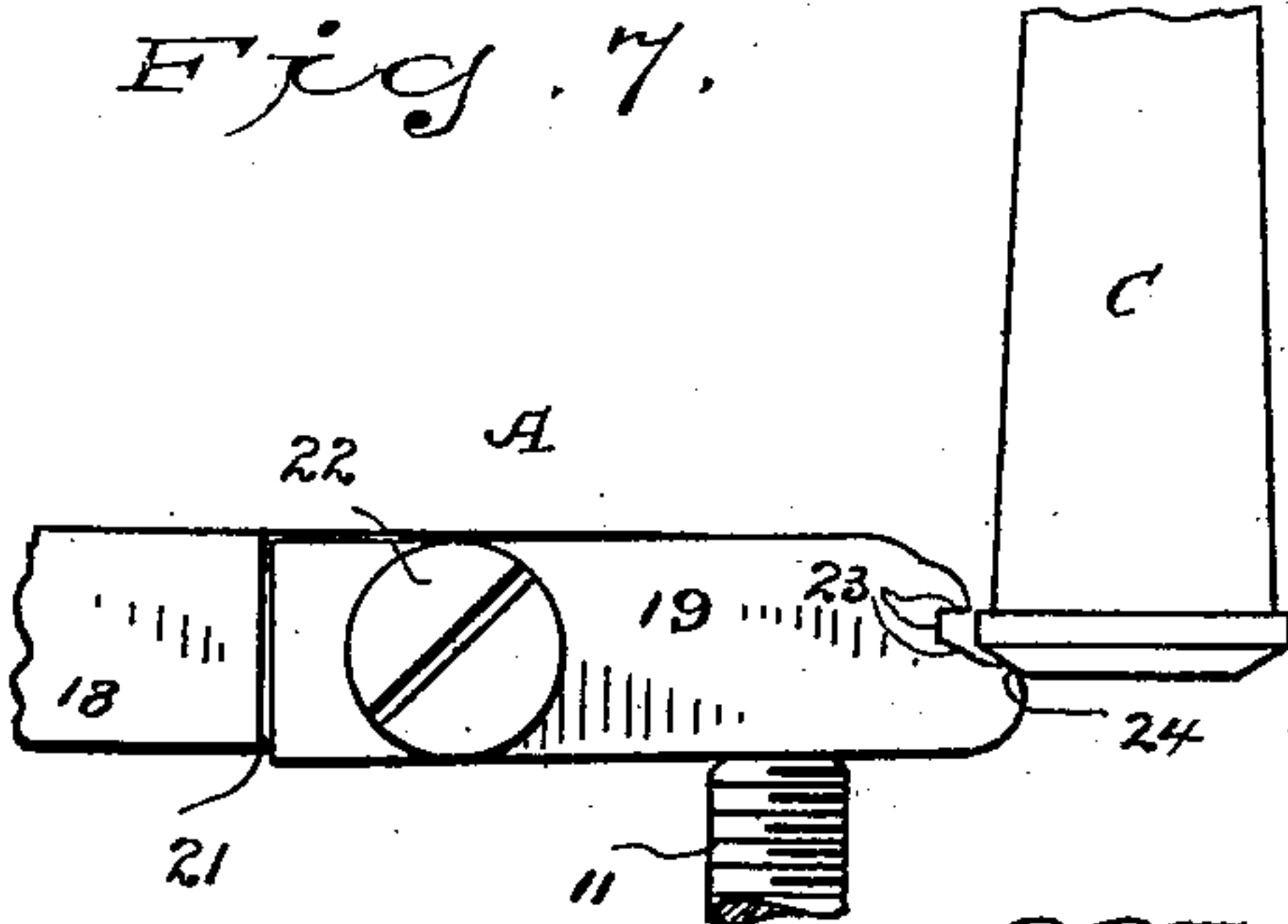


Fig. 9.

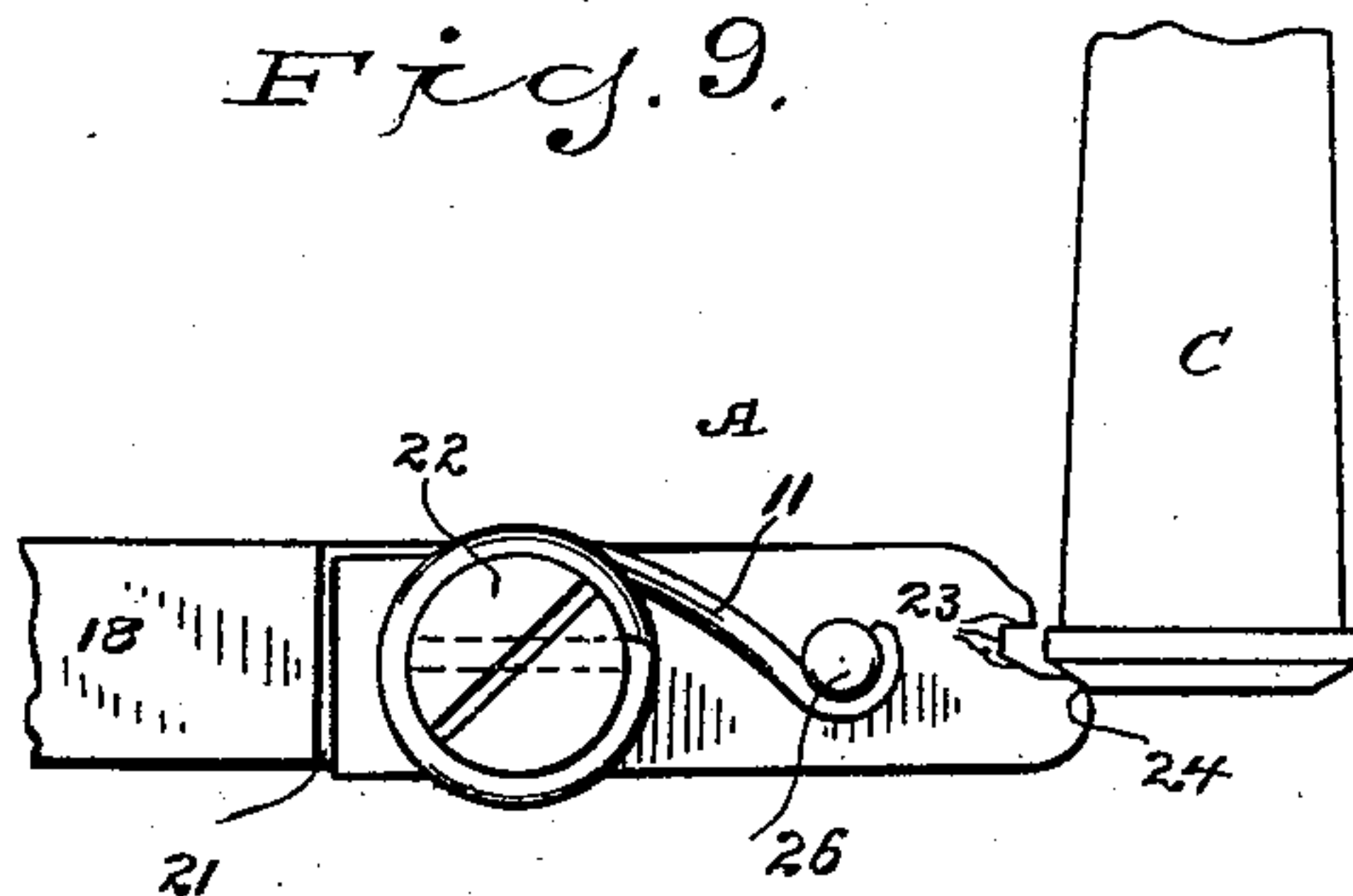


Fig. 8.

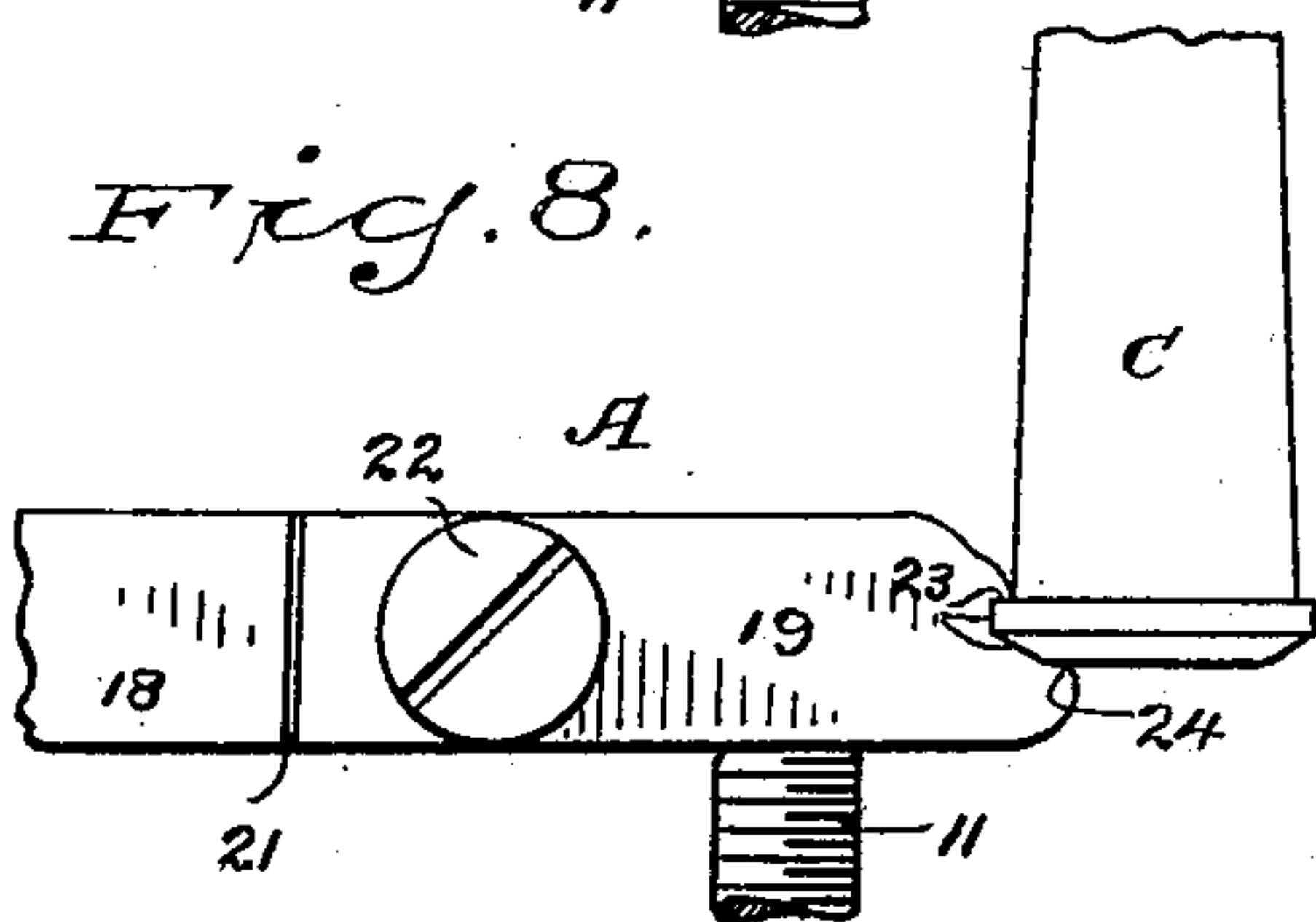


Fig. 10.

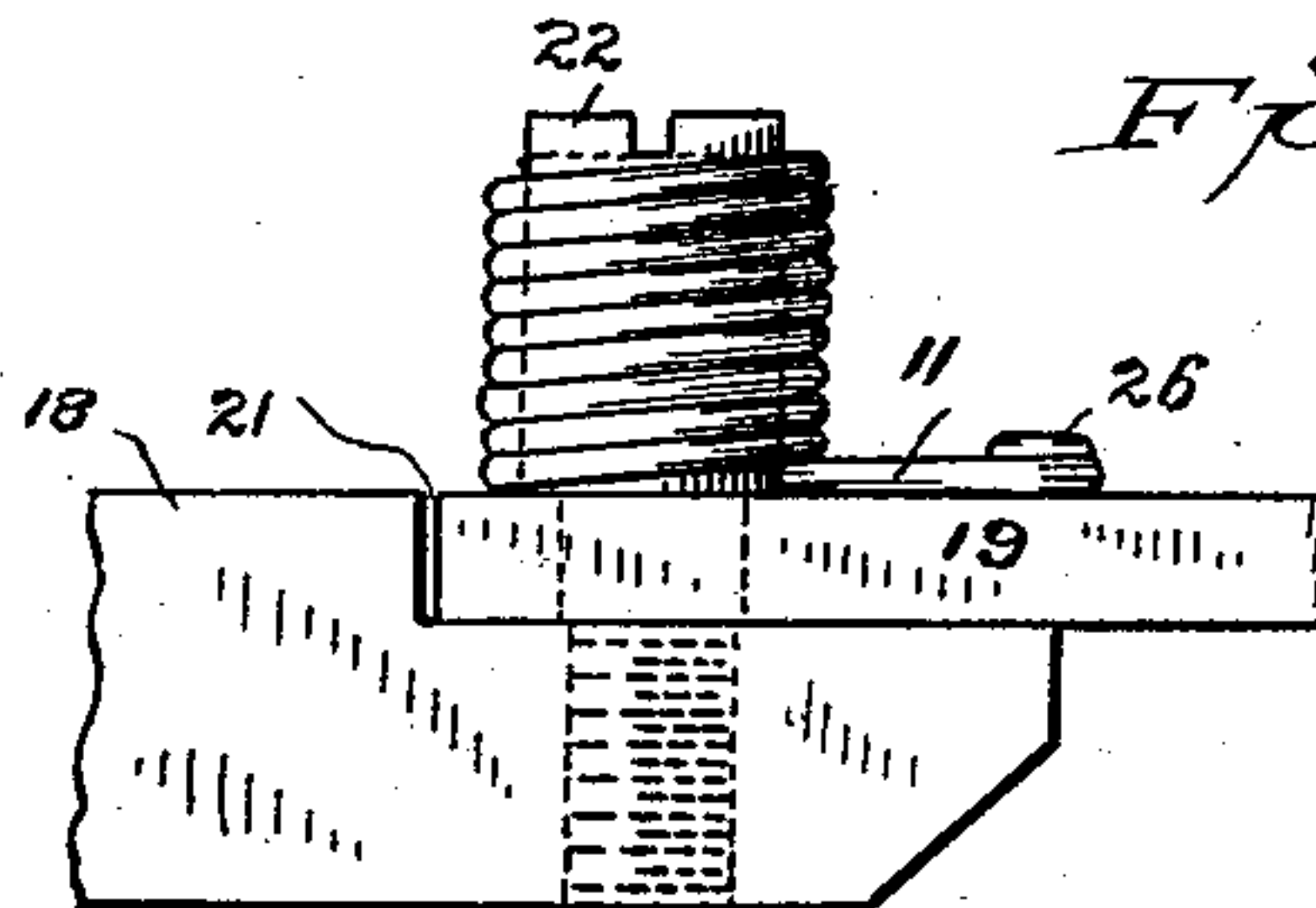
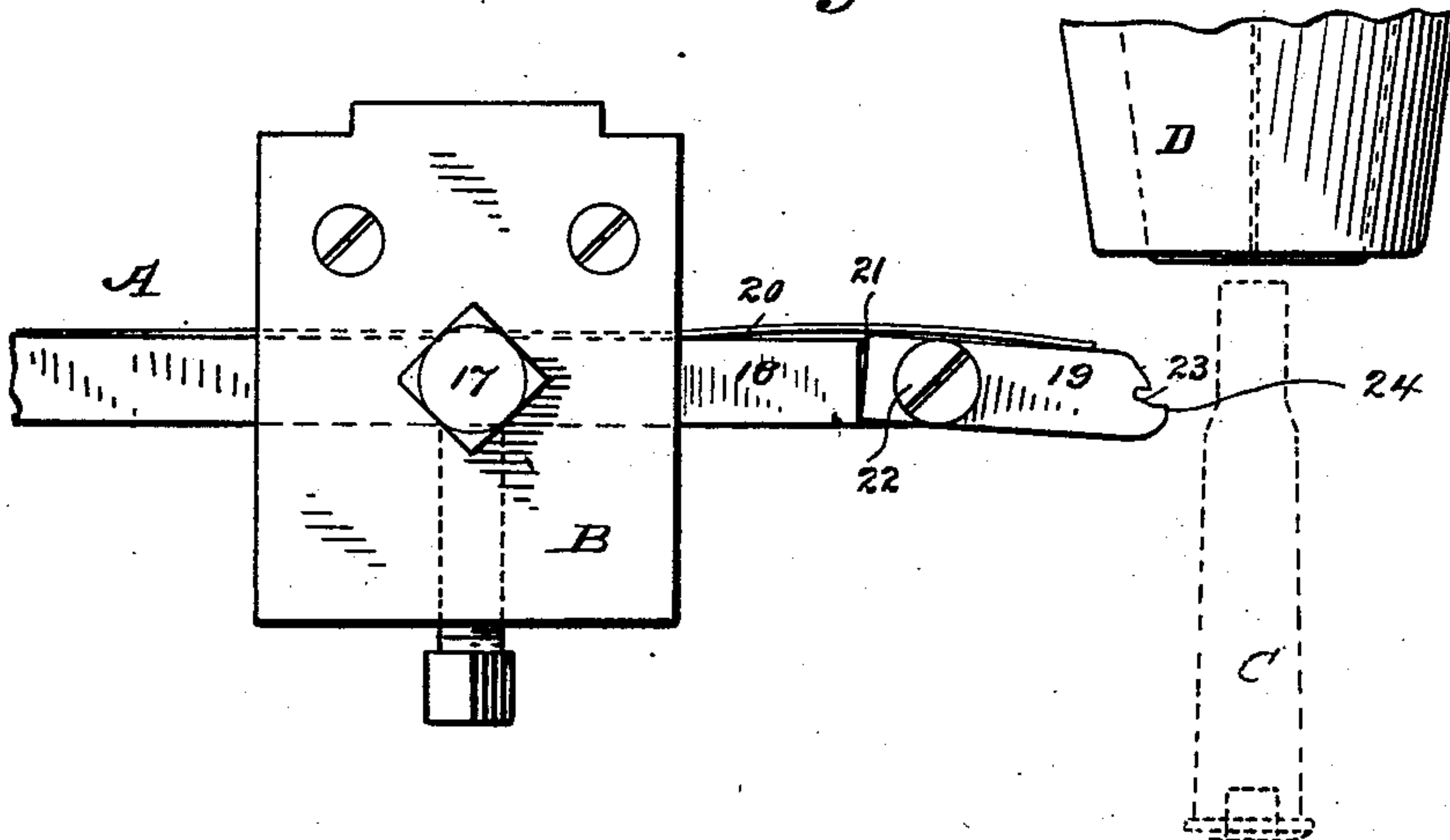


Fig. 11.



WITNESSES

H. A. Lamb  
S. P. Heley

INVENTOR

Thomas H. Rylands  
By  
A. M. Wooster  
Atty.



# UNITED STATES PATENT OFFICE.

THOMAS H. RYLANDS, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE UNION METALLIC CARTRIDGE COMPANY, OF SAME PLACE.

## TOOL FOR TURNING HEADS OF CARTRIDGE-SHELLS.

SPECIFICATION forming part of Letters Patent No. 626,634, dated June 6, 1899.

Application filed March 9, 1899. Serial No. 708,384. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS H. RYLANDS, a citizen of the United States, residing at Bridgeport, county of Fairfield, State of Connecticut, have invented a new and useful Tool for Turning Heads of Cartridge-Shells, of which the following is a specification.

My invention relates to the manufacture of cartridge-shells, and has for its object to provide a tool for turning the heads of shells which shall be so constructed as to make use of the outer face of the head of each shell as a gage to determine the position of the cutter while it is operating on said shell.

The essential features of my invention are a cutter adapted to be moved toward and from the heads of shells and also movable laterally and means for automatically adjusting the lateral position of the cutter according to the longitudinal position of the shell that is to be operated upon.

I find in practice that by the use of my novel tool I am enabled to approach so near to absolute accuracy in the turning of each shell that the greatest variation in the heads of shells turned thereby is less than two one-thousandths of an inch. It will be obvious that this accuracy and perfection of finish is a matter of vital importance in cartridges for magazine-rifles and machine-guns, in which the mechanism by which the cartridges are handled is operated with great rapidity.

In the accompanying drawings, forming part of this specification, Figures 1, 2, and 4 are plan views showing different forms of my novel tool and illustrating its mode of operation; Fig. 3, an edge view corresponding with Fig. 1; Fig. 5, an edge view corresponding with Fig. 4; Fig. 6, a section on the line 6 6 in Fig. 4; Fig. 7, a detail view, on an enlarged scale, corresponding with Fig. 4, showing a position of the cutter at the instant of the first engagement with the head of a shell; Fig. 8, a similar view showing the operative position of the cutter; Fig. 9, a view similar to Fig. 7, illustrating another form in which I have carried my invention into effect; Fig. 10, an edge view corresponding with Fig. 9; Fig. 11, a view corresponding substantially with Figs. 4, 7, and 8, showing the retracted position of the cutter and the pressure-rod;

and Figs. 12 and 13 are elevations, respectively, of a cartridge-shell before and after being operated upon by my novel tool.

A denotes the tool proper; B, a carrier therefor; C, a cartridge-shell that is being operated upon; D, a rotating chuck by which the shells are carried, and E a yielding pressure-rod which engages the outer face of the heads of shells and forces them into the chuck.

No shell-feeding mechanism is illustrated for the reason that so far as my present invention is concerned the feeding of the shells may be performed by hand or mechanically in any ordinary or preferred manner.

The chuck is not illustrated in detail, as it is simply necessary for the purposes of my invention that each shell while it is being operated upon be held firmly by suitable jaws and rotated at a high rate of speed.

The construction of the pressure-rod is not illustrated in detail, as specifically it is not of the essence of my invention. It is simply required that said pressure-rod be so constructed as to yield in the direction of its length—that is, that it be held in its operative position yieldingly instead of positively. The special manner in which spring-pressure is applied, however, is wholly unimportant so far as my present invention is concerned.

10 denotes a rotating button which may or may not be provided with a boss adapted to enter the primer-pocket in the heads of shells, said primer-pocket being indicated by dotted lines only. This button I have shown as carried by a head 12, provided with a shank 13, (see dotted lines,) which engages a longitudinal opening in the end of the pressure-rod with a drive fit. The button is provided with a shank 14, which lies in an opening in the head, in which it is secured by means of a pin 15 engaging a groove in the shank, thus permitting the button to rotate freely.

It will of course be apparent that various unavoidable circumstances are likely to cause variation in the position of the shells relatively to the cutter after the shells have been gripped by the jaws of the chuck. For example, the shells may vary slightly in thickness or in length, either of which variations might cause the jaws of the chuck as they moved to the gripping position to force the



shell outward slightly farther than the normal position or possibly not quite so far out. So far as the mere holding of the shells is concerned these variations are compensated for by making the pressure-rod yielding in the direction of its length, so that it will readily adapt itself to the movement of the jaws of the chuck and hold each shell firmly, but yieldingly, without regard to whether it is or is not held at exactly its normal position by the jaws of the chuck. This yielding of the pressure-rod in accommodating itself to varying positions of the shells causes a variation of several thousandths of an inch in the position of the head of the shell relatively to the cutter that is to operate upon it. It is this unavoidable variation in the position of the shells that is overcome by my novel tool, in which the laterally-movable cutter is automatically adjusted by means of the outer faces of the heads of the shells themselves, so that changes in the longitudinal position of the shells are so perfectly compensated for that shells turned by my novel tool will vary less than two one-thousandths of an inch. I thus produce an almost perfect shell for use in magazine-rifles and machine-guns. It should be understood that my invention lies in the tool solely and not in the machine in which it is used and that my novel tool may be substituted for other tools of its class in machines now in use. It will also be understood that the diameter of the heads of finished shells is determined by adjustment of the tool proper in carrier B or by adjusting the forward movement of the carrier.

The tool proper comprises a holder 18, adapted to be rigidly secured in the carrier, and a cutter laterally movable in any convenient manner relatively to the holder. The cutting edge, which is specifically indicated by 23, is so shaped as to impart to the heads of shells the exact contour required.

24 denotes a guide which I ordinarily use, although in the forms illustrated in Figs. 2 and 11 it is merely auxiliary to spring 20 and in the form illustrated in Fig. 1 performs no function whatever and may be dispensed with. This guide when used extends forward from the cutting edge in such a position as to engage the outer face of the head of each shell while it is being operated upon.

The carrier is simply required to be so constructed as to adapt it to carry the tool proper. The holder is shown as seated in a recess in the carrier, in which it is locked after adjustment by a set-screw 17. Besides the laterally-movable cutter the other essential element is a retaining device which holds the cutter while it is operating upon the shell in the position to which it has been automatically adjusted by the outer face of the head of the shell itself. This retaining device, which I have indicated generically by 11, and its mode of operation upon the laterally-movable cutter may be varied to an almost unlimited extent without departing from the principle of

my invention. For example, it may be a screw carried by an extension 16 from the head of the pressure-rod, as in Figs. 2, 4, 7, 8, and 11, or an arm extending therefrom, as in Fig. 1, or a spring carried by the holder, as in Figs. 9 and 10.

In the form illustrated in Fig. 1 the special feature of construction is that the cutter is rigidly secured to a laterally-movable slide and the retaining device is an arm extending from the head of the pressure-rod and engaging a recess in the slide. 27 denotes a head forming part of holder 18, said head being provided with undercut ways 28, which receive a slide 29, adapted to reciprocate in a direction transverse to the line of movement of the carrier, holder, and cutter, as will be clearly understood from Fig. 1. The cutter is rigidly secured to the slide in any suitable manner, as by screws 32. 30 denotes a recess in the slide, which is engaged by the retaining device, in this instance an arm extending from head 12 of the pressure-rod. In practice the end of the arm is ordinarily beveled, as shown, to facilitate engagement with the recess. If preferred, the positions of the arm and recess may be reversed—that is to say, a suitable retaining device 11 may extend from the slide instead of from the pressure-rod and engage a recess in the head of the pressure-rod instead of in the slide. In order to avoid the possibility of the slide moving far enough in either direction to prevent the arm from engaging the recess in the slide when the forward movement of the carrier takes place, I preferably provide a suitable stop 31 for limiting the movement of the slide. This stop may be of any convenient construction—for example, a pin passing through a slot in the slide and engaging the head 27 of the holder. The operation of this form of my invention is as follows: As the pressure-rod advances from the position shown in Fig. 11 toward the position shown in Fig. 1 the button upon the head of the pressure-rod engages the outer face of the head of the shell that is to be operated upon, the boss, if used, passing into the primer-pocket. As the shell is forced forward the open end passes into the chuck, which may be of any ordinary or preferred construction, is engaged by the jaws, and is rotated thereby, button 10 upon the head of the pressure-rod rotating with the shell. The instant the shell is seated in the chuck the carrier, with the tool proper, moves forward from the position shown in Fig. 11 and the head of the shell is engaged by the cutting edge, as clearly shown in Fig. 1. The automatic centering or adjustment of the cutter relatively to each shell to be operated upon is effected in this form through the engagement of a retaining device—i. e., an arm extending from the head of the pressure-rod with both sides of a recess in the slide. The pressure-rod, as in all machines of this character, must yield slightly in the event of the shell being pushed outward slightly by the



jaws of the chuck, but at the same time must press firmly against the head of the shell.

The gist of my invention lies, as already stated, in making the outer face of the head of each shell a gage for determining the position of the cutter while it is operating upon that shell. In this form the desired result is attained through the engagement of the outer face of the head of the shell with the rotating button carried by the pressure-rod, the pressure-rod yielding slightly should the shell be moved backward by the jaws of the chuck. The outer face of the head of the shell therefore determines the position of the pressure-rod, which in turn, through the engagement of the retaining device with both sides of a recess in the slide which carries the cutter, automatically adjusts the position of the cutter to the position of the shell and retains the cutter in what is practically a geometrically accurate position during its operation on each shell.

The form illustrated in Fig. 2 differs from the form just described in that the retaining device 11 is a screw carried by an extension of the head of the pressure-rod. The cutter is rigidly secured to the slide, as in the other form, and the slide is provided with a head 33, which is engaged by the screw to move the slide and cutter forward in the direction of movement of the pressure-rod against the power of a spring 20, which bears against the opposite side of the slide and holds the latter firmly in engagement with the screw.

In the forms illustrated in Figs. 4 to 11, inclusive, no slide is used and the cutter is pivoted to the holder so as to have a slight oscillatory movement. The holder is shown as provided with a recess 21 and the cutter as secured in said recess by a screw-pin 22. The oscillation of the cutter in either direction is limited by the engagement of the base of the cutter with the base of recess 21, as will be obvious from the figures of the drawings last above referred to. In Fig. 11 I have shown a spring 20 as used in connection with this form of cutter, said spring bearing against the side of the cutter forward of its pivotal point and turning the cutter to a position slightly oblique to its operative position. This spring is not an essential feature of construction and may be omitted, if preferred, as in Figs. 4, 7, and 8.

The operation of the form illustrated in Figs. 4, 7, 8, and 11 is briefly as follows: As the pressure-rod moves forward from the position shown in Fig. 11 toward the position shown in Fig. 4 the screw engages the cutter, and an instant later the cutter commences to move forward, as clearly shown in Fig. 7. As the cutter moves forward, guide 24 first engages the head of the shell, approximately as indicated in Fig. 7. The continued forward movement of the cutter causes the cutter to adjust itself to the head of the shell, as clearly shown in Fig. 8, retaining device 11 and the

pressure-rod moving backward slightly in order to permit this automatic adjustment of the cutter to the head of each shell, the pressure-rod continuing, however, to hold the guide firmly in engagement with the outer face of the head of the shell, which is thus made, in this form as in the others, the gage which determines the position of the cutter while it is acting upon the shell.

In the form illustrated in Figs. 9 and 10 the retaining device 11 is a strong spring coiled about screw-pin 22, which is extended for the purpose, one end of the spring being rigidly secured thereto. The other end of the spring bears against a pin 26 and acts to throw the cutter forward in the direction of the movement of the pressure-rod and to retain the guide pressed firmly, but yieldingly, against the outer face of the head of the shell that is being operated upon, the outer face of the head of the shell being, in this form as in the others, the gage which determines the position of the cutter. The operation of this form will be clearly understood from the drawings. As the cutter moves forward, guide 24 first engages the head of the shell, approximately as indicated in Fig. 9. The continued forward movement of the cutter causes the latter to adjust itself to the head of the shell, as in the other form, the retaining device—i. e., the spring—yielding sufficiently to permit this automatic adjustment of the cutter to the head of the shell and continuing to hold the guide firmly in engagement with the outer face of the head, as in the form last described.

Having thus described my invention, I claim—

1. A tool of the character described consisting of a holder, a laterally-movable cutter carried thereby and a retaining device adapted to be controlled by the outer face of the head of a shell that is being operated upon, whereby the lateral position of the cutter is regulated automatically.

2. A tool of the character described consisting of a holder, a laterally-movable cutter carried thereby and having a guide extending forward from the cutting edge and a retaining device adapted to be controlled by the outer face of the head of a shell that is being operated upon, whereby the lateral position of the cutter is regulated automatically and the guide is held in engagement with the head of the shell.

3. A tool of the character described consisting of a holder, a cutter pivoted thereto and having a guide extending forward from the cutting edge and means for holding the guide with a strong but yielding pressure against the outer face of the head of a shell that is being operated upon.

4. A tool of the character described consisting of a holder, a cutter pivoted thereto and having a guide extending forward from the cutting edge for the purpose set forth and means for holding said guide with a strong



but yielding pressure against the outer face of the head of a shell that is being operated upon.

5 5. The tool A consisting of a holder adapted to be moved toward and from the work and a cutter carried by the holder and free to move laterally relatively to said holder, and means contacting with the work to gage such lateral movement.

10 6. In a tool of the character described the combination with a laterally-movable cutter, of a retaining device adapted to be controlled by the outer face of the head of a shell that is being operated upon, substantially as shown 15 for the purpose specified.

20 7. In a tool of the character described the combination with a holder and a cutter pivoted thereto, of a retaining device adapted to be controlled by the outer face of the head of a shell that is being operated upon, whereby the lateral position of the cutter is regulated automatically.

8. In a tool of the character described the combination with a holder and a cutter pivoted thereto and having a guide extending 25 forward from the cutting edge, of a retaining device adapted to be controlled through the engagement of the outer face of the head of a shell that is being operated upon with the guide.

30 9. A tool for turning heads of cartridge-shells comprising in its construction a cutter movable toward and from the side of the head and also laterally movable and means for automatically gaging and controlling the lateral 35 position of the cutter according to and from an adjacent portion of the shell.

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

THOMAS H. RYLANDS.

Witnesses:

A. M. WOOSTER,  
S. V. HELEY.