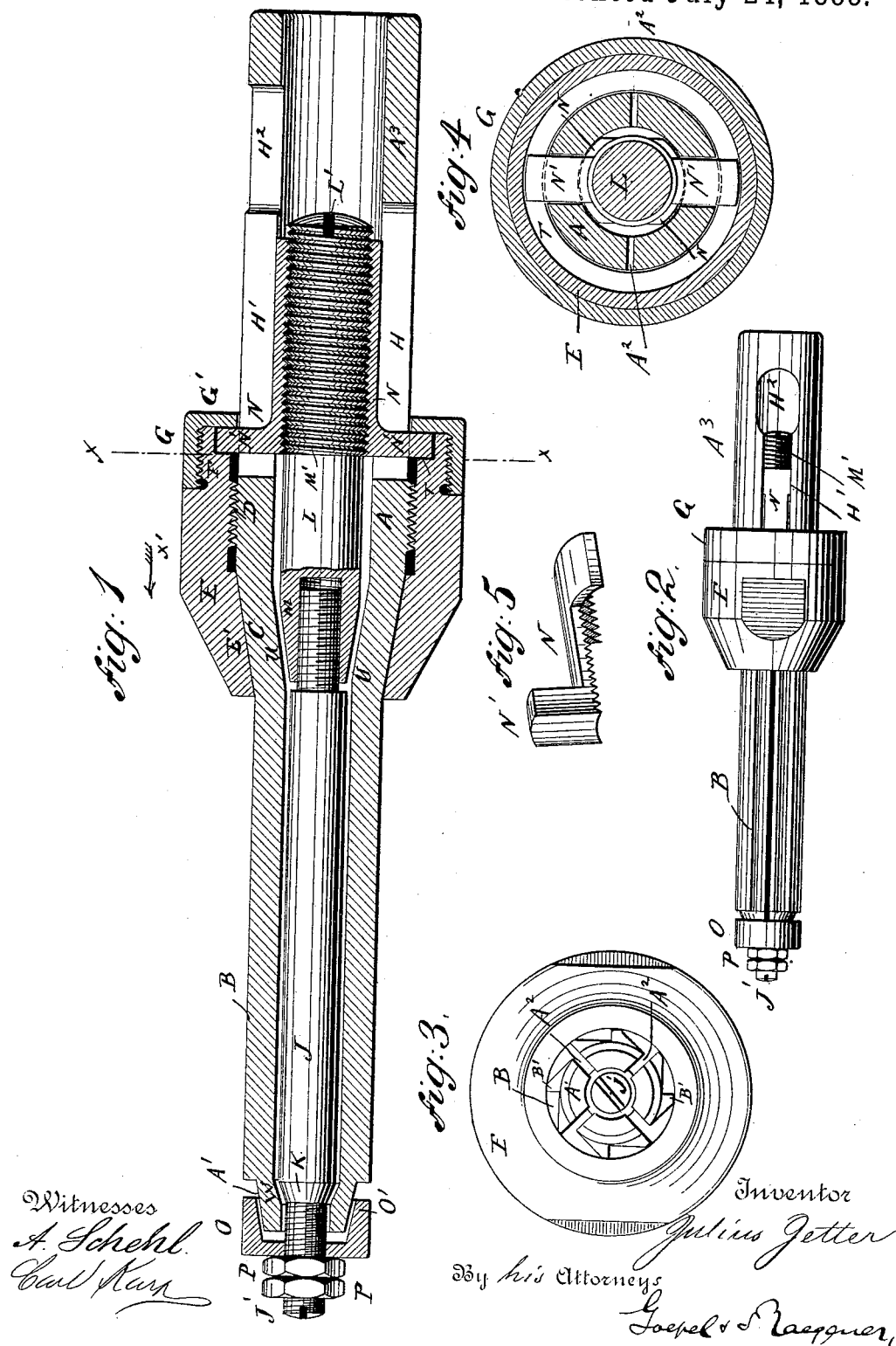


(No Model.)

J. JETTER.  
REAMER.

No. 386,708.

Patented July 24, 1888.



# UNITED STATES PATENT OFFICE.

JULIUS JETTER, OF ELIZABETH, NEW JERSEY.

## REAMER.

SPECIFICATION forming part of Letters Patent No. 386,708, dated July 24, 1888.

Application filed May 22, 1888. Serial No. 274,666. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS JETTER, of Elizabeth, in the county of Union, State of New Jersey, have invented certain new and useful Improvements in Reamers, of which the following is a specification.

The object of my invention is to provide a new and improved reamer which can readily be adjusted to have greater or less diameter.

The invention consists in the combination, with a slotted tubular stock having interior and exterior bevels, of a spindle mounted in said stock and having bevels, a beveled sleeve screwed on the stock, a beveled cap on the end of the spindle, and angle-clips held on the sleeve and connected with the spindle, whereby said spindle can be moved longitudinally in the stock by turning the sleeve.

The invention also consists in the construction and combination of parts of details, as will be fully described and set forth hereinafter.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of my improved adjustable reamer. Fig. 2 is a top view of the same; Fig. 3, a front end view; Fig. 4, a cross sectional view on the line *x x*, Fig. 1; and Fig. 5, a perspective view of one of the angle-clips.

Similar letters of reference indicate like parts.

The tubular stock A of the reamer is provided at one end with the annular bevel A', and from said beveled end the longitudinal slots A<sup>2</sup> extend toward the opposite end of the stock and form the cutters B, having the longitudinal teeth B' of the usual construction.

At about the middle of its length the stock A is provided with the annular beveled shoulder C, and from said shoulder to the right-hand end the stock has greater diameter than the part forming the cutters, the said part having the greater diameter being designated by the letter A<sup>3</sup>. At the wider end of the beveled shoulder C the part A<sup>3</sup> is provided with the screw-thread D, on which the internally-screw-threaded sleeve E can be screwed. Said sleeve has an internal bevel, E', corresponding to the taper of the shoulder C. At the end opposite the bevel said sleeve E is provided with the externally-threaded shoulder F, on

which the retaining-ring G, having the internal flange, G', can be screwed.

The part A<sup>3</sup> of the stock is provided with the two opposite longitudinal slots H H', of which the latter is longer than the former and has an enlargement at its lower end, H<sup>2</sup>.

The spindle J, which is passed longitudinally through the slotted part of the stock, is provided at its outer end with a thread, J', and behind said thread with an annular bevel, K. The opposite or inner end of the spindle J is screwed into or otherwise connected with the front end of the spindle L, provided with the annular bevel M. The spindle L has a preferably left-hand screw-thread, M', and is provided in its end with a slot, L', for applying a screw-driver.

In each slot H and H', I place an angle-clip, N, one shank of which is concaved on the inner surface and screw-threaded to engage the thread M' of the spindle L. A cap, O, having the internally-beveled flange O', is held by nuts P on the threaded end J' of the spindle J. The bevels of the flange O', the bevel E', the shoulder C, the sleeve E, and the spindle L all have the same inclination. The sleeve E is screwed on the thread D. The angle-clips N are placed into the slots H H', the enlargement H<sup>2</sup> of the slot H' permitting the enlarged outer ends of said clips to enter, and said clips are so adjusted that their lugs N' rest against the annular shoulder T in the end of the sleeve E. The united spindles J and L are then inserted longitudinally in the base of the stock, and the threaded part of the spindle L is screwed in between the threaded shanks of the clips N. The ring G is then screwed on the shoulder F, its flange G' resting against the outer sides of the lugs N'. The flanged cap O is then secured on the end J' of the spindle J by means of the nuts P.

The operation is as follows: When it is desired to expand the reamer, the sleeve E is turned on the stock A, so as to move in the direction of the arrow *x'*, whereby the clips N are moved in the same direction, and also move the spindles J and D in the same direction. The bevel M of the spindle L acts on the internal bevel, U, of the stock and at that point forces the blades of the reamer outward, and at the same time the bevel K in the spindle J,

acting on the internal bevel, W, at the free ends of the blades B, forces them outward against the inner surface of the flange O' of the cap O, said cap moving with the spindles J and L in the direction of the arrow X'. When it is desired to contract the reamer, the sleeve E is turned to move on the stock A in the reverse direction of the arrow x'. The shoulder T of said sleeve moves the clips N and the spindles J and L in the inverse direction of the arrow x'. The bevel E' of the sleeve E, acting on the bevel C of the stock, presses the blades B inward at that point. As the cap O moves with the spindles, the inner beveled side of its flange O', acting on the bevel K of the blades, presses the free ends of the blades toward each other and the spindle J. The reamer can thus be adjusted by turning the sleeve E on its axis.

Instead of the longitudinal teeth, the blades may have inclined or transverse teeth, as in a tap.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an adjustable reamer, the combination, with the tubular stock A, having longitudinal slots throughout a part of its length, the exterior bevel, A', and the interior bevel, W, at the slotted end, the beveled exterior shoulder, C, the beveled interior shoulder, U, both near the inner ends of the slots, and the exterior screw-thread, D, adjacent to the exterior beveled shoulder, C, of a spindle in the bore of the stock, which spindle is provided with the bevel K at the end, the bevel M, adjacent to the interior beveled shoulder, U, of the stock, the beveled sleeve E, screwed on the stock and connected with the spindle, and the cup O on the outer end of said spindle, which cup has an interiorly-beveled flange, substantially as herein shown and described.

2. In an adjustable reamer, the combination, with the tubular stock A, having longitudinal slots throughout a part of its length, the exterior bevel, A', and the interior bevel, W, at said slotted end, the exterior beveled shoulder, C, and the interior beveled shoulder, U, near the inner ends of the slots, the screw-thread D, adjacent to the shoulder C, and the slots H H', of a spindle in the bore of the stock, which

spindle is provided at one end with a bevel, K, and with a bevel, M, adjacent to the interior beveled shoulder, U, of the stock, the beveled sleeve E, screwed on the thread D, and angle-clips N in the slots H H' of the stock, which clips are connected with the spindle, the ring G on the sleeve E, and holding said clips against the sleeve, and the cup O, secured on the end of the spindle and having an interiorly-beveled flange, substantially as herein shown and described.

3. In an adjustable reamer, the combination, with a tubular stock, A, having longitudinal slots throughout part of its length, the exterior bevel, A', and the interior bevel, W, at the slotted end, the beveled exterior shoulder, C, the interior beveled shoulder, U, near the inner ends of the slots, and the exterior screw-thread, D, adjacent to the exterior beveled shoulder, C, of a spindle in the bore of the stock, which spindle is provided with the bevel K at the end, the bevel M, adjacent to the interior beveled shoulder, U, of the stock, the screw-thread M' on the inner end of the stock, the beveled sleeve E, screwed on the screw-thread D, the angle-clips N in longitudinal slots of the stock, which clips have one shank concaved transversely and provided with a screw-thread, a flange-ring for holding the lugs of said clips against the sleeve on the stock, and the cup O, held on the outer end of the spindle and having an interiorly-beveled flange, substantially as herein shown and described.

4. In an adjustable reamer, the combination, with a longitudinally slotted tubular stock, A, having interior and exterior bevels, of a spindle having bevels, the beveled sleeve E, screwed on the stock, the angle-clips N, connected with said sleeve and the spindle, and a beveled cup on the end of said spindle and at the end of the stock, substantially as herein shown and described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JULIUS JETTER.

Witnesses:

ROBERT BEEZ,

WILLIAM RIEDINGER.