(No Model.) 2 Sheets—Sheet 1.

C. D. MARSH & A. D. HERMANCE.

REAMER.

No. 525,466. Patented Sept. 4, 1894.

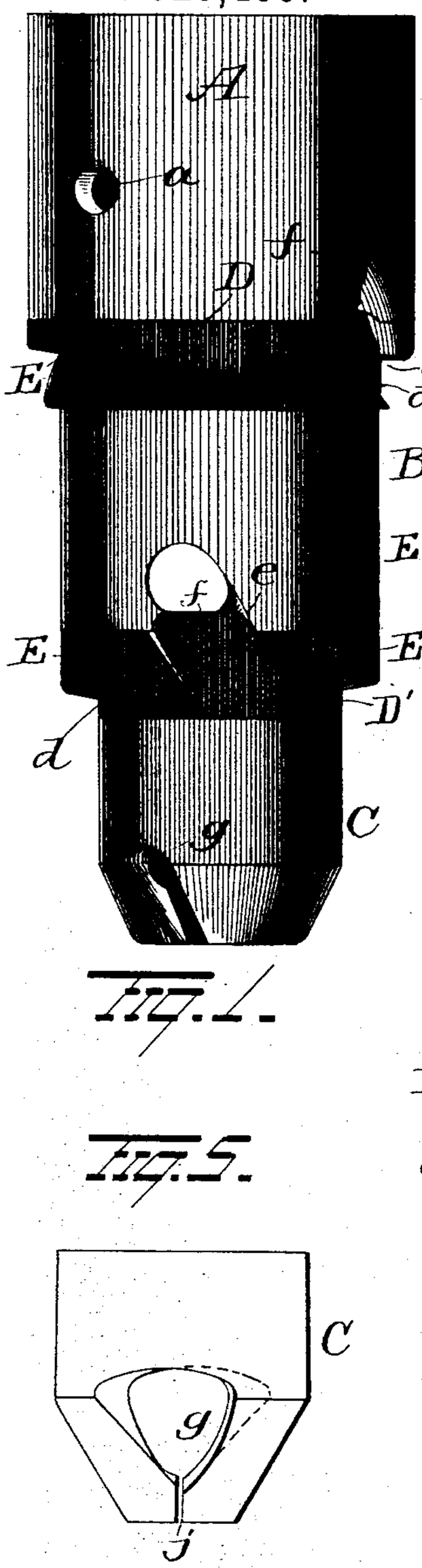


Fig. 1.

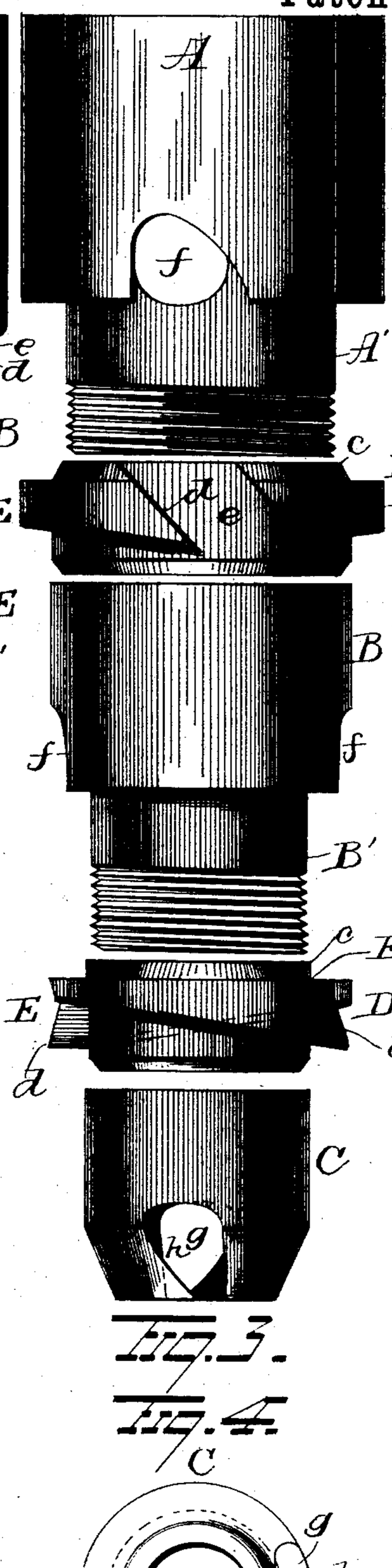


Fig. 3.

Fig. 4.

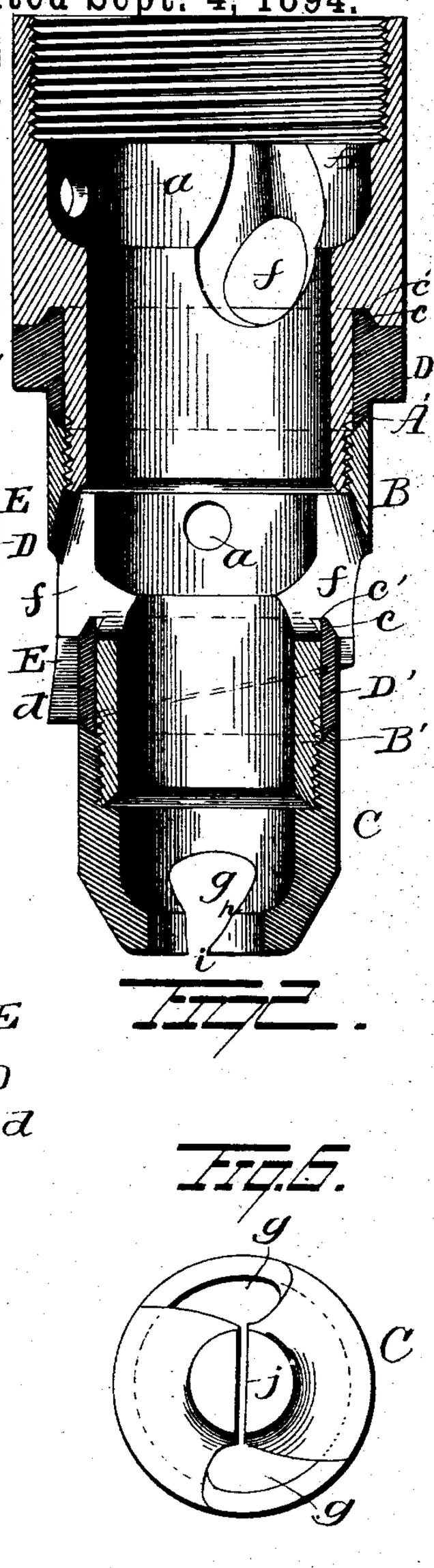
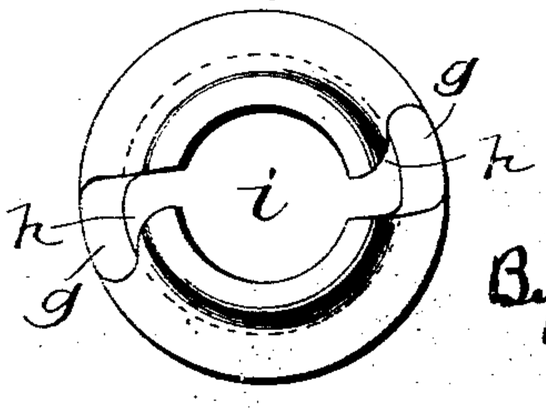


Fig. 2.

Fig. 5.

Fig. 6.



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(No Model.) 2 Sheets—Sheet 2.

C. D. MARSH & A. D. HERMANCE.

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Fig. 7.

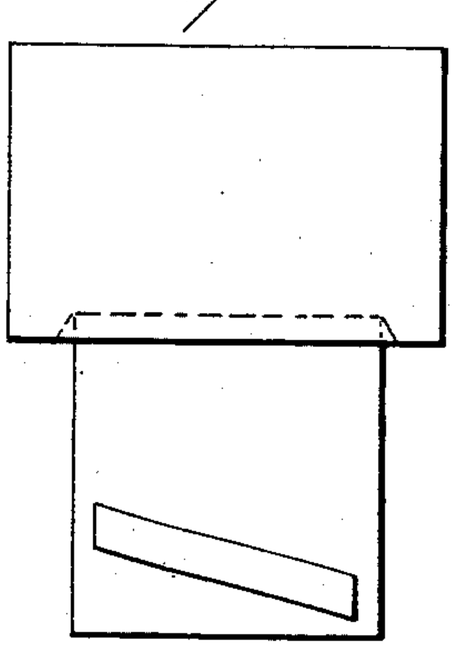


Fig. 8.

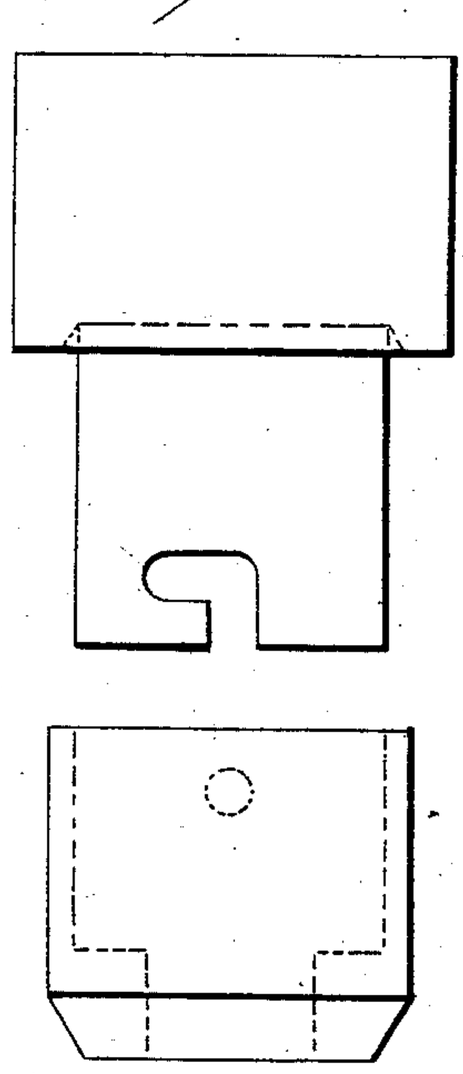


Fig. 9.

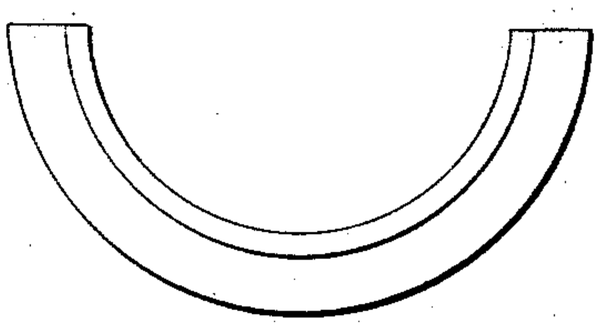
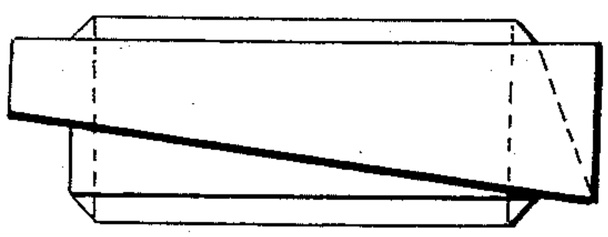


Fig. 10.



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UNITED STATES PATENT OFFICE.

CALVIN D. MARSH AND ALBERT D. HERMANCE, OF WILLIAMSPORT, PENNSYLVANIA; SAID MARSH ASSIGNOR TO SAID HERMANCE.

REAMER.

SPECIFICATION forming part of Letters Patent No. 525,466, dated September 4, 1894.

Application filed April 12, 1894. Serial No. 507,276. (No model.)

To all whom it may concern:

Be it known that we, CALVIN D. MARSH and ALBERT D. HERMANCE, of Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Reamers; and we 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.

Our invention relates to an improvement in reamers, and more particularly to such as are employed for reaming wooden pipe which has previously been bored by a small auger.

In the manufacture of wooden pipe or tubing, the piece of wood is first bored from each end by the use of a small auger. In most instances the two holes thus produced will not exactly align where they meet at the center of the piece of wood and as a consequence difficulty is encountered when the reamer, subsequently introduced into the small auger hole reaches such point, the reamer often choking and failing to remove, with the necessary rapidity, the greater quantity of wood which must there be cut at one side of the hole, and failing to properly remove the shavings produced by the cutting of the reamer.

It is the object of our invention to construct a reamer in such manner as to insure the proper production of the bore of the proposed pipe and to provide adequate means for the escape of shavings as fast as they are produced, not only at various points in the length of the reamer, but also at the end of the head of the reamer.

A further object is to cheapen the cost of production of a reamer and at the same time enhance its efficiency.

With these objects in view the invention consists in a reamer having a conical cutter head made with an opening at its forward extremity.

The invention also consists in a reamer comprising a series of detachable hollow sections, each section having an opening in its wall, of a series of cutters adapted to align with said openings so as to cause shavings produced by said cutters to pass through the openings. And the invention also consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings: Figure 1 is an elevation of our improved reamer. Fig. 2 is a sectional view. Fig. 3 is a view showing the parts of the device separated. Fig. 4 is an end view of the head of the reamer. Figs. 5, 6, 7, 8, 9, and 10 are views of modifications.

Our improved reamer may comprise, besides the cutter head, one cutter ring, or it may be made with two or more cutters, but usually at least two pairs of cutters, arranged in different planes are employed and such a reamer is shown in the drawings and will be described in the following detail description of the invention.

A represents a sleeve or cylindrical shell of soft steel, iron or other low priced material, provided interiorly at its base with screw-threads (preferably left hand threads) adapted to receive the screwthreaded end of the main barrel or cylinder (not shown) of the device. The sleeve or shell A is made with a tubular shank A′ having exterior left-hand screw-threads at its outer end for the reception of similar screwthreads on the interior of a second sleeve or shell B, of a diameter less than that of the sleeve or shell A and of the same material. The sleeve or shell B is made with a tubular shank B′ having left hand screw-threads at its outer end for the reception of a hollow cutter head C of less diameter than the sleeve or shell B. Each sleeve or shell, A, B, is made with a perforation *a* for the reception of a spanner or other tool by means of which to screw them in place. It is not absolutely essential that the sleeves or shells and the cutter head be secured together by means of screwthreads and that the sleeve or shell A be secured to the main barrel of the implement in the same manner, as these connections can be made by means of eccentric slides or inclined slots and pins.

Encircling the blank portion of the shanks A′, B′, are cutter rings D, D′, of different diameters, each of said rings having a flange *c* projecting from the under face thereof and adapted to enter annular grooves *c′* made in the sleeves or shells A, B, at the base of the

shanks A′, B′, thereof. Each ring is provided on its periphery with two flanges E, E, each flange being made smaller at one end than at the other and the larger end of each flange is beveled to produce cutting edges *d*, the larger or cutting end of each flange terminating a short distance from the smaller end of the adjacent flange, so as to produce spaces *e* coincident with said cutting edges. The smaller ends of the flanges E, E, are also preferably beveled and the spaces *e* between the ends of the flanges are adapted to communicate with openings or passages *f* in the sleeves or shells A, B, the walls of said openings preferably being beveled so as to assist in directing shavings, produced by the cutters, through said openings *f* into the interior of the sleeves or shells, from which said shavings escape through the usual hollow barrel or tube to which the device is secured. Instead of producing the cutters by means of flanges projecting from rings, these cutter rings may be made in sections.

By the construction and arrangement of parts above described the cutters can be readily removed and sharpened by the use of a flat file or by an emery wheel and, when said cutters are in place, they will be retained tightly in position. The parts of the device being connected together by left-hand screw-threads, the operation of the tool will always tend to tighten these connections. As there will be practically no wear on the sleeves or shells A, B, they may be made of inferior metal and will last an indefinite length of time,—thus rendering the production of the tool very cheap and at the same time its efficiency will be enhanced.

The cutter head C is made tubular in form and has its free extremity somewhat contracted in size. In diametrically opposite walls of the contracted portion of the cutter head, oval openings *g* are made, one wall of each opening being beveled to produce cutting edges *h*, and the upper ends of said openings being made to communicate with an opening *i* in the free extremity of the cutter head. By thus constructing the cutter head, the shavings will find a free passage into the end of the cutter head and the cutters *h* will properly remove the offset produced by the preliminary boring with the auger as above explained. By making the end of the head open, clogging will be effectually prevented.

Instead of making a round opening *i* in the end of the cutter head, said opening may be made in the form of a slot *j* as shown in Figs. 5 and 6.

In Fig. 7 we have shown an inclined fastening for connecting sections together.

In Fig. 8 we have shown a pin and L-shaped slot or what is termed a bayonet joint.

In Figs. 9 and 10 we have shown cutters made in half sections as alluded to previously.

Our improvements are simple in construction, cheap to manufacture and effectual, in all respects, in the performance of their functions.

Various other slight changes might be made in the details of construction of our invention without departing from the spirit thereof or limiting its scope and hence we do not wish to restrict ourselves to the precise details of construction herein set forth but,

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A reamer comprising separable sleeves or shells and intermediate cutter rings interposed and held fast between the sleeves or shells and the sleeves or shells screwed together by means of left hand threads, substantially as set forth.

2. A reamer comprising a series of hollow sections, and cutters retained in place by and between said hollow sections, substantially as set forth.

3. A reamer comprising hollow detachable sections and a series of removable cutters retained in position by and between said hollow detachable sections, substantially as set forth.

4. In a reamer, the combination with a series of sections, of cutters located between said sections, said sections being so connected together that when the tool is in operation the connections between said sections will tighten whereby to always insure the proper retention of the cutters in position, substantially as set forth.

5. A reamer composed of two or more hollow sections of different diameter, one adapted to screw into the other, and a cutter interposed between these sections, said cutter being a continuation of one section, substantially as set forth.

6. A reamer composed of two or more hollow sections constructed to screw together, a cutter encircling the threaded portion of one section and constituting a continuation of its larger portion, said cutter held between the two sections when they are screwed together, substantially as set forth.

7. In a reamer, the combination with a shell or sleeve, having an opening in its wall and a screwthreaded shank projecting from said sleeve or shell, of a cutter ring encircling said shank and adapted to direct shavings through the opening in the shell, and a cutter head adapted to screw on said shank, substantially as set forth.

8. In a reamer, the combination with a sleeve or shell having a screwthreaded shank and an annular groove at the base of said shank, of a cutter ring adapted to encircle said shank and having a flange to enter said groove, and a cutter head adapted to screw on said shank, substantially as set forth.

9. In a reamer, the combination with a shell or sleeve having an opening in its wall, and a screwthreaded shank, of a cutter ring adapted to encircle said shank and to direct shavings through the opening in the shell, a smaller

shell or sleeve adapted to screw on said shank and having an opening in its wall, a shank projecting from the smaller shell or sleeve, a cutter ring encircling said last-mentioned shank and adapted to direct shavings in the smaller shell or sleeve, and a hollow cutter head adapted to screw on the shank of the smaller shell or sleeve, substantially as set forth.

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

CALVIN D. MARSH.
ALBERT D. HERMANCE.

Witnesses:
A. N. ARMS,
J. S. TAYLOR.