

(No Model.)

D. W. SIPRELL.
Manufacture of Mining Augers.

No. 232,767.

Patented Sept. 28, 1880.

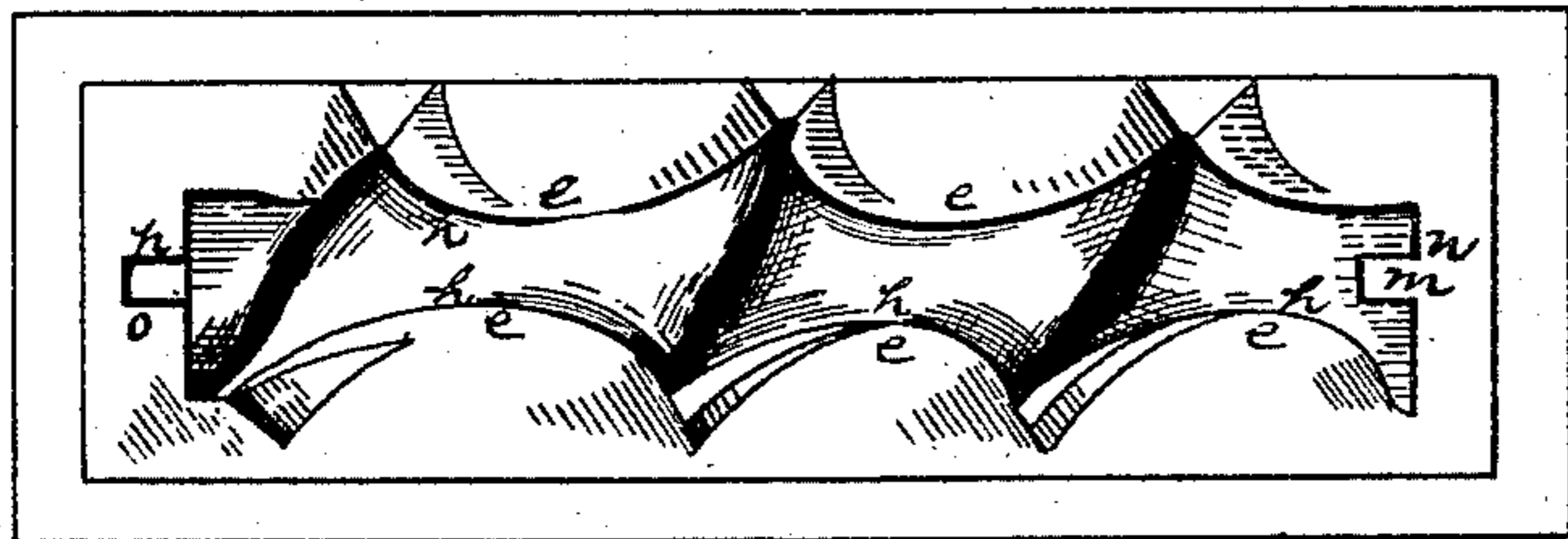


Fig. 1.

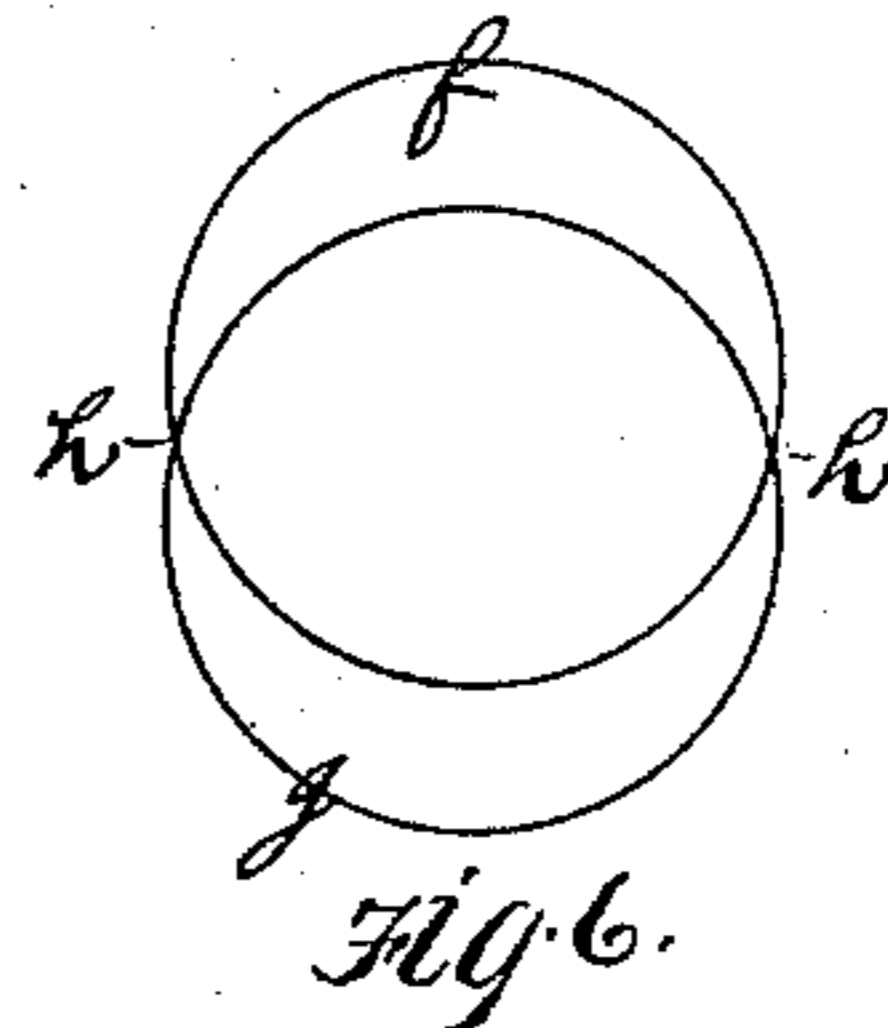


Fig. 6.

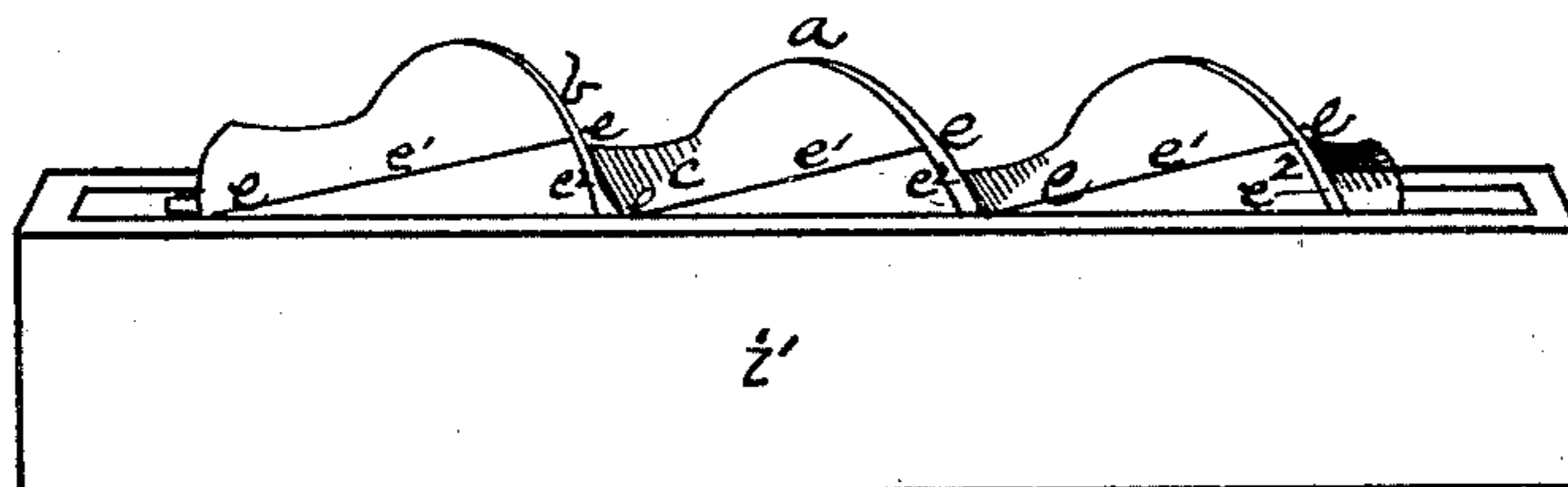


Fig. 2.

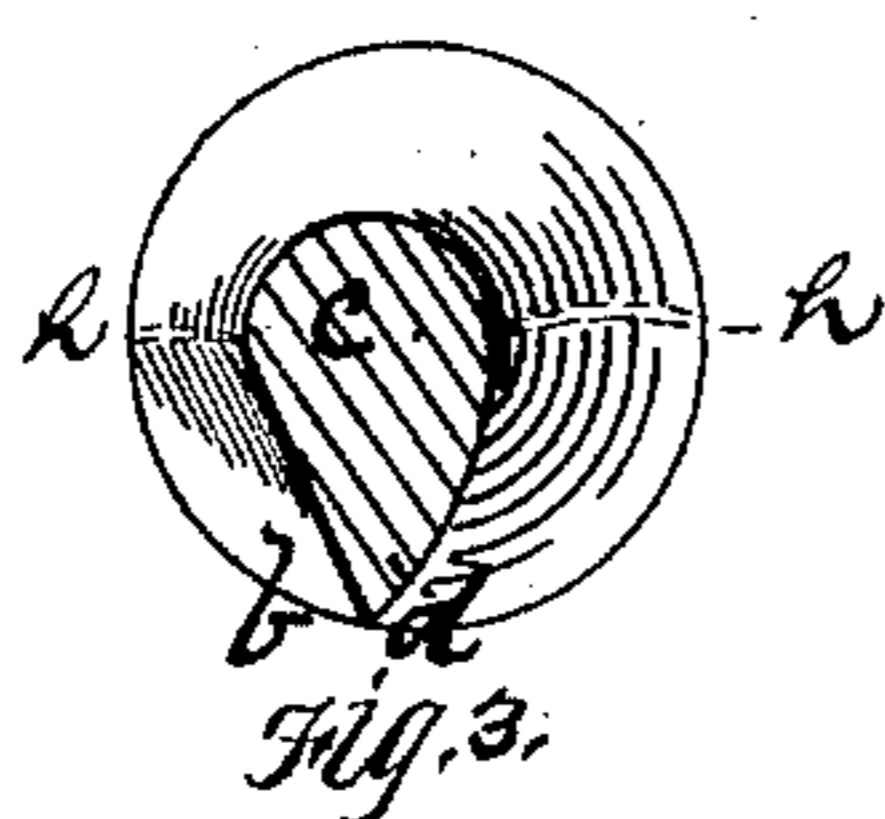


Fig. 3.

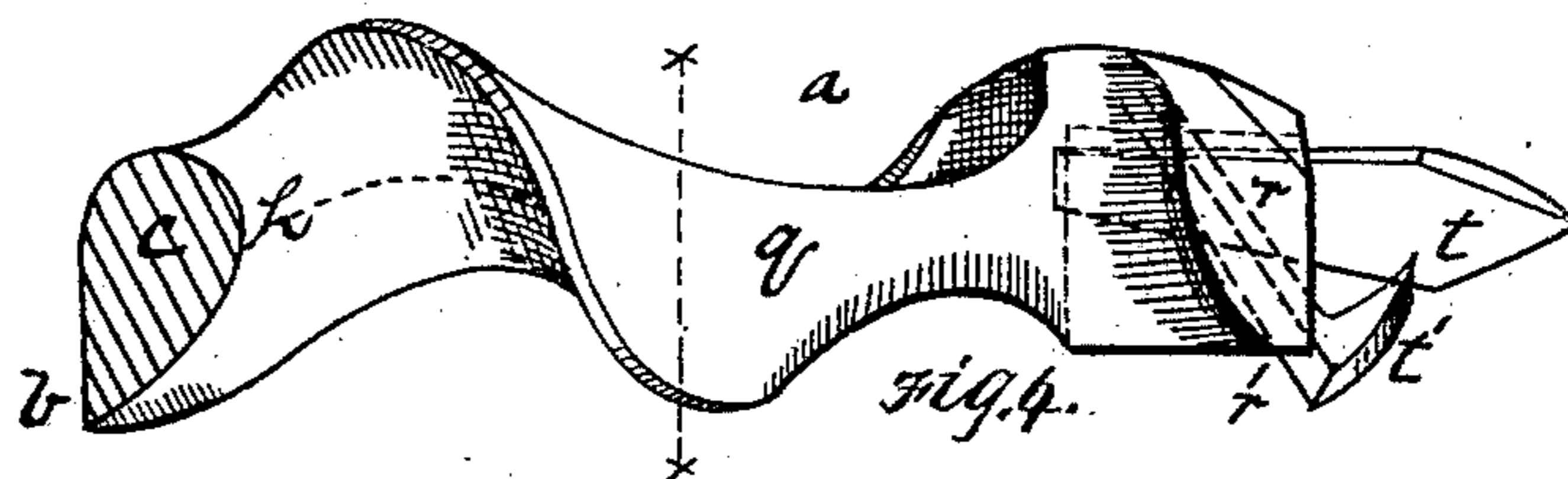


Fig. 4.

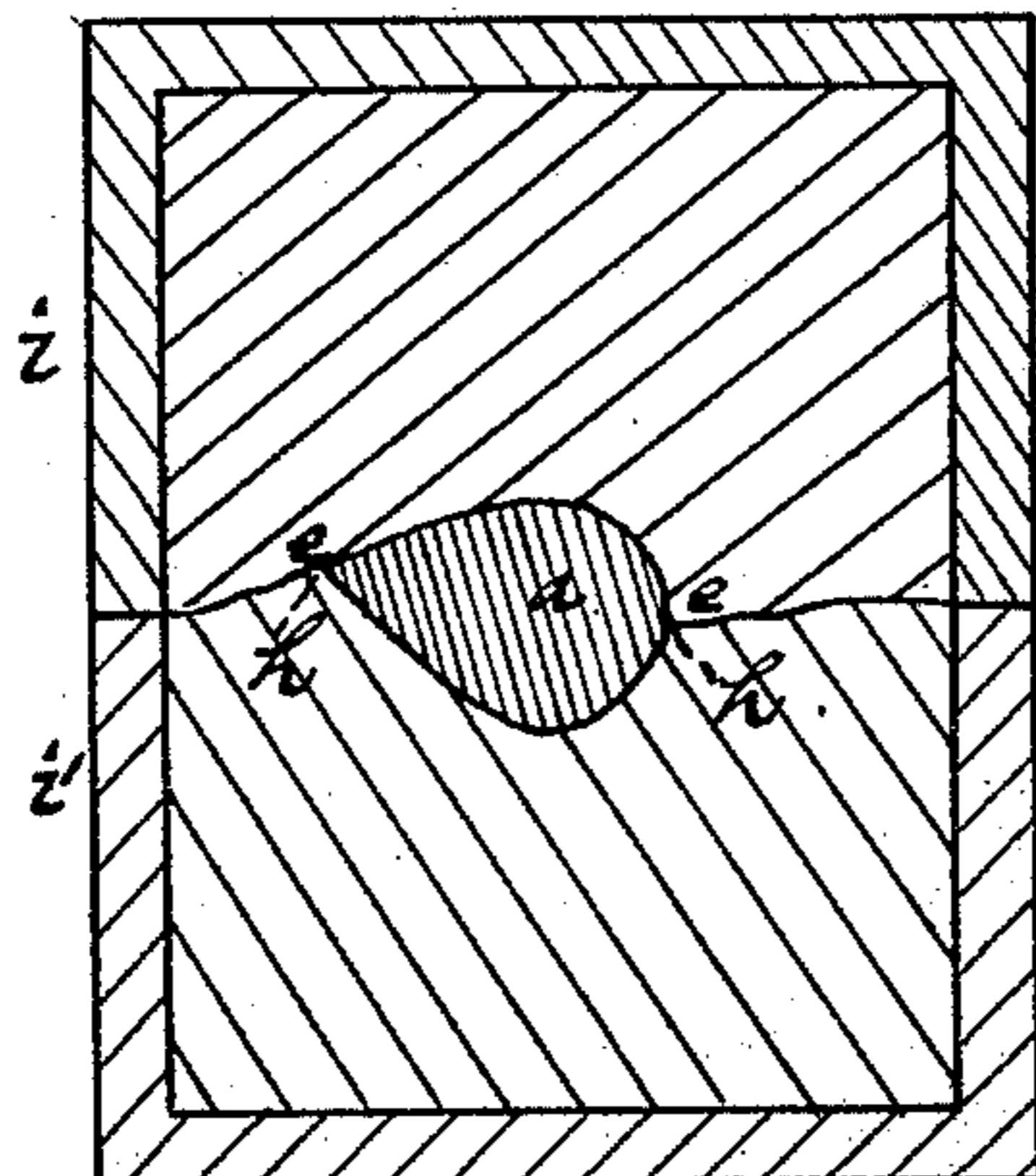


Fig. 5.

Witnesses.

J. W. Bakewell.

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Inventor
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UNITED STATES PATENT OFFICE.

DARIUS W. SIPRELL, OF CANAL DOVER, OHIO, ASSIGNOR OF ONE-THIRD
OF HIS RIGHT TO JOHN A. HOSTETLER.

MANUFACTURE OF MINING-AUGERS.

SPECIFICATION forming part of Letters Patent No. 232,767, dated September 28, 1880.

Application filed August 12, 1880. (No model.)

To all whom it may concern:

Be it known that I, DARIUS W. SIPRELL, of Canal Dover, in the county of Tuscarawas and State of Ohio, have invented a new and useful Improvement in the Manufacture of Mining-Augers; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of one-half of the mold in which I cast my improved auger-stem. Fig. 2 is a side view of the same containing the pattern. Fig. 3 is a cross-section. Fig. 4 is a view of the bit-section, showing the knife-sockets and knives. Fig. 5 is a cross-section of the mold, and Fig. 6 is an illustrative diagram.

Like letters of reference indicate like parts in each.

My invention consists in making augers for mining purposes by casting; and it also consists in the improved form of the augers so made.

The casting of augers has never to my knowledge been practiced, and, in fact, it would be impossible to cast any of the forms now in general use, because that the patterns could not be drawn from the sand without destroying the mold. I have, in devising a form of auger especially adapted to boring coal and other minerals, obtained a form which can be cast, as the pattern can be drawn in the manner usually practiced in casting. Thus I have invented a new method of making auger-stems. I have also devised a certain way of forming the mortises for uniting the sections and for receiving the knives, whereby the knives can be certainly given the highest pitch.

The auger-stems heretofore used for boring coal and other minerals have always had a uniform spiral or thread, and have all been open to the objection that when used in damp rock the borings moving back from the bit do not pass out, but become packed around the stem, clogging it and preventing the auger's advance. This difficulty is obviated by my improved auger.

To enable others skilled in the art to make and use my invention, I will describe its method of manufacture and use.

My improved auger *a* is not round in cross-

section, like the old form, but is oval or elliptical in cross-section, similar to a figure formed by the intersecting lines of two overlapping circles, as illustrated by Fig. 6 of the drawings, and as the thread constitutes a tapered spiral flange, *b*, running around the stem *c*, it will project in similar form from one side, as at *d* in Fig. 3. The stem *a* is therefore formed of a series of curved sections, the lines *e* of intersection of which extend diagonally across the stem, and as the circles *f g*, upon which the adjoining sections are struck, do not coincide, a corner, *h*, is formed at the intersection. The stem *a* is therefore formed of a series of curved intersecting inclined planes, which may be of the same or of several different angles, as may be desired, and at each intersection there is a corner or bead, *h*.

I form this stem by casting of any desired length in partible molds *i i'*, the pattern being molded in sand in the usual way practiced in casting. The part between the molds *i i'* is made on a zigzag line, *e*, so that all of the stem below the corner *h* shall be cast in the lower part of the mold and all above the line *h* in the upper mold. It is apparent that the pattern can be drawn from such a mold without destroying it or disturbing the sand. The line of part *e*, as viewed, Fig. 2, from the side, consists of a series of inclined planes, *e'*, connected by short nearly-vertical lines, *e''*, and the shoulder *h*, formed on the stem, cast in such a mold, will, of course, show the same appearance upon a side view.

As these augers are formed in sectional lengths, so that the stem can be lengthened or shortened at pleasure by adding or detaching sections, I insert in one end of the mold *i i'* a socket-pattern, *m*, for forming a socket, *n*, in the casting, and form in the sand, at the other end, a print, *o*, for making a square pin or projection, *p*, on the casting. Then the sections of the stem, being all alike, can be united by simply inserting the pin *p* into the socket *n* in an adjoining section.

In the bit-section *q*, I form sockets *r*, for the reception of the knives *t t'*, in a manner similar to that of forming the sockets *n*.

Heretofore the sockets for the reception of the knives have been made by boring and chis-

eling. This was a work requiring the utmost care and precision, as the shape and direction of the socket determined the position or pitch of the knives, and any variation from the proper angle was deleterious, if not fatal, to the usefulness of the tool. In addition to this the making of the sockets required the most skillful and expensive labor. By my method I am able to make the socket at little or no additional expense, and with absolute precision.

There is great advantage in the use of my improved auger. The borings, instead of becoming packed around the stem, are forced tightly up each incline, and then upon passing the corner *h* at each turn of the auger obtain clearance therefrom, and so are forced out to the mouth of the bore, while the effect of the corner *h* upon the rock is to wedge and break it off, and thus make a freer and fuller bore.

An advantage in the construction of the stem is that, whereas the coiling or planing by which old forms of auger were made either distorted or cut the fiber of the metal, in this it remains intact, preserving its original strength. In addition to this the flange *b* is formed tapering in cross-section—that is, with a wide base and tapering to a narrower apex, as shown by Fig. 3. This gives the flange a greater strength, which is further increased by the fact that it is supported by a solid stem, *c*, integral therewith.

The formation of the sockets *rr* by casting, instead of cutting out, gives them greater

strength, for the reason that thereby the fiber of the metal is not cut at that point nor the structure weakened.

Other advantages consist in the economy of manufacture, the ease of replacing broken parts, and the strength of the entire stem.

One turn of the web or flange constitutes the length of the diagonal elliptical sections which make up the stem.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of forming auger-stems herein described, which consists in casting them in partible molds, the line of part being in a series of inclined lines extending diagonally between the turns of the web, substantially as and for the purposes described.

2. A cast auger-stem formed with diagonal elliptical sections having a projecting edge or shoulder extending along its sides in a series of inclined lines between each turn of the web, substantially as and for the purposes described.

3. A cast auger-stem section having a cast socket or sockets in the end thereof for the reception of the pin of the adjoining section or of the cutting-knives, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand.

DARIUS W. SIPRELL.

Witnesses:

WM. H. ROWLES,
JOHN W. LILLER.