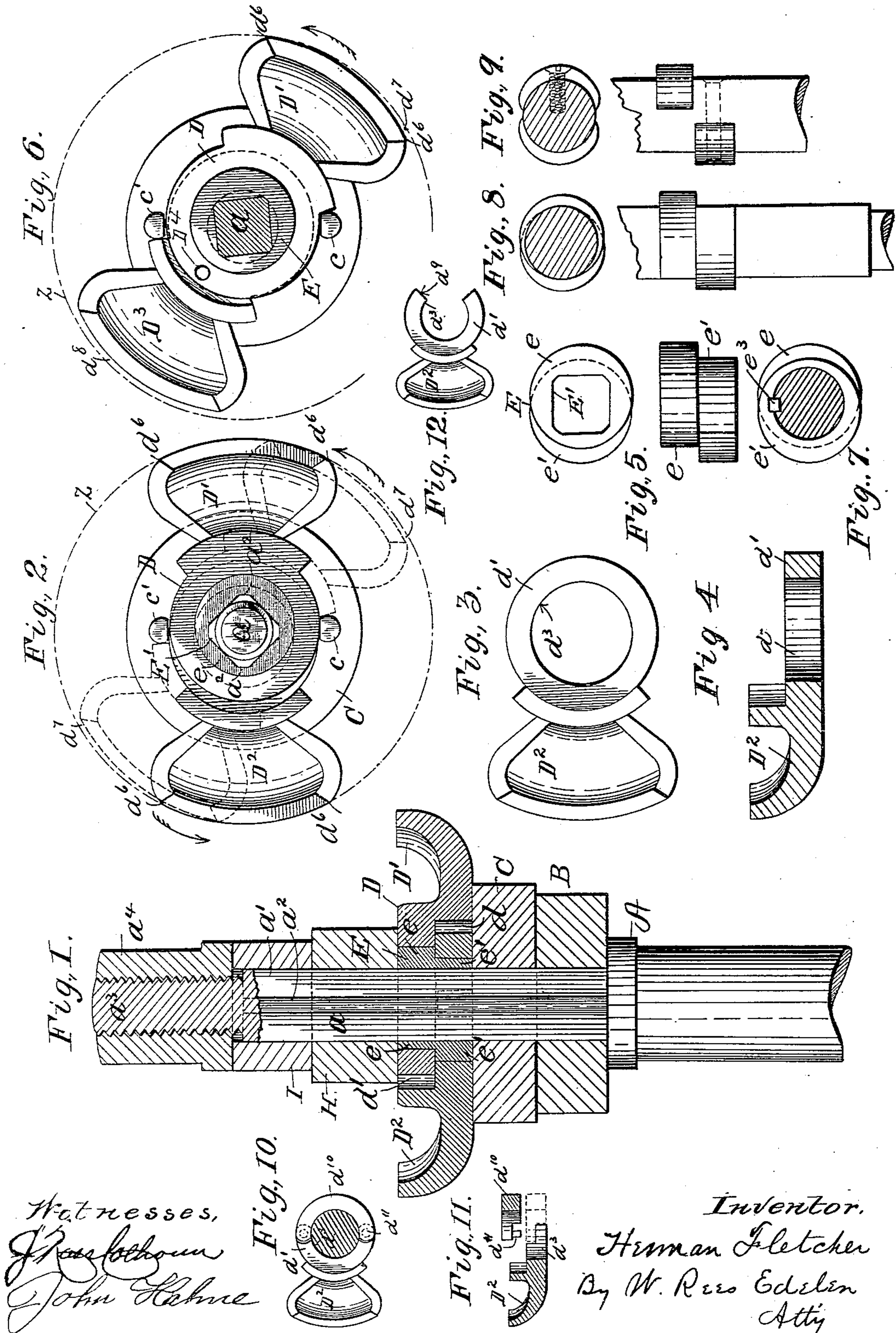


(No Model.)

H. FLETCHER.
CUTTER HEAD.

No. 559,971.

Patented May 12, 1896.



ANDREW B GRAHAM, PHOTO LITHO WASHINGTON, D.C

UNITED STATES PATENT OFFICE.

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CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 559,971, dated May 12, 1896.

Application filed November 27, 1895. Serial No. 570,268. (No model.)

To all whom it may concern:

Be it known that I, HERMAN FLETCHER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Cutter-Heads; and I 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.

My invention has reference to improvements in cutter-heads for shaping or molding machines; and it consists of certain novel features of construction, which will be hereinafter described, and pointed out in the claims.

The object of the present invention is to construct a reversible rotary cutter-head with independent cutters pivotally connected or hinged to the operating-spindle of the machine and adapted to be shifted automatically to present a cutting edge in either direction.

A further object of the invention is to provide suitable eccentrics secured to a spindle and adapted to hold in position pivoted or hinged cutters when reversing the machine and to allow said cutters to roll around the eccentrics, so as to afford sufficient clearance.

A further object of the invention is to provide suitable stops for retaining the cutters in their working position when automatically shifted through the reversing of the cutter-spindle.

A further object of the invention is to provide a single reversible cutter operated by a single eccentric and kept in equilibrium by means of a counterweight.

Referring to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in the various views, Figure 1 is a central vertical section, partly in elevation, of my improved device. Fig. 2 is a plan view of the same with the nut and washers removed, exhibiting the cutters in a non-working position. Figs. 3 and 4 are respectively plan and section of the left-hand cutter. Fig. 5 represents plan and side elevation of the double eccentrics. Fig. 6 represents a single cutter with its accompanying counterweight, the spindle being in cross-section.

Fig. 7 represents a bottom view of eccentrics secured to the spindle, which is in section, by a feather or key. Fig. 8 represents, respectively, plan and elevation of eccentrics integral with the spindle. Fig. 9 represents plan and elevation of cams or lugs screwed and also riveted to the cutter-spindle. Fig. 10 represents a modification in plan of a left-hand cutter composed of two parts and held in position by pins. Fig. 11 is a section of the same with the removable part immediately above its normal position, exhibiting the pin-fastening. Fig. 12 is a slight modification of one of the cutters with a portion removed.

My invention consists of a spindle A, provided with a stem a , having flat and rounded parts a' and a'' running longitudinally of said stem, the extreme end of said stem being provided with a threaded portion a^3 , which is adapted to receive a nut a^4 for securing cutters D through the medium of sleeves H and I. Said cutters are mounted on a large collar C, the latter being supported by a smaller collar B. Collar C is provided with stop-pins c and c' for engaging the shoulders on the opposite sides of each cutter D' and D^2 when reversed, as shown in dotted lines, Fig. 2. Collar C, previously referred to, can be substituted for collar H, and said pins c and c' depend from said collar C, this position of the collar being preferable with operators on this class of machines. Mounted on spindle-stem a is an integral double eccentric E, comprising eccentrics e and e' , which have their bearing upon collar C, and having their lobes or thicker portions directly opposite each other, and are prevented from turning by means of the polygonal opening E' embracing said polygonal stem a .

Stem a can be circular in cross-section and adapted to secure eccentric E by means of a feather e^3 , as indicated at Fig. 7, and work equally as well as the polygonal stem previously referred to.

The cutters D' and D^2 are stepped at their shanks, as indicated at d' , (see Figs. 1 and 4,) and overlap each other, the openings d^3 in the cutters embracing or being pivotally connected to the eccentrics e and e' , previously referred to. This stepping of the pivotal portion of said cutters is very essential, as the

horizontal faces or opposite sides of the same must be parallel, which is necessary when one cutter must follow in the track of the other or preceding cutter. By this means a hinged joint is formed, which is necessary in my improved cutters, and which will be hereinafter more fully described. It is preferable to have the depth of the combined eccentrics e and e' about one-hundredth of an inch longer than the height or depth of the overlapping portions d' of said cutters, so that the impinging collars H and C may be firmly seated against said eccentrics, thus allowing said cutters to swing in a horizontal position free from the collars previously referred to.

When necessary to reverse the machine or cutter-head, the operator shifts the belt on the driving-pulleys, (which are of ordinary construction and not shown in the drawings,) which consequently turns or revolves spindle a in the opposite direction, and as stop-pins c and c' revolve with said spindle a they come in contact with the opposite sides of said cutters and cause them to revolve in the same direction with said spindle a .

It will be observed that the cutters D' and D^2 in Fig. 2 are directly opposite each other and held in this abnormal position by the extreme throw of said eccentrics. (See eccentrics in Fig. 1.) They are shown in this position to indicate that they are concentric with the dotted line Z. The extreme cutting edges d^6 of said cutters are situated on said dotted line Z when cutting in either direction. In Fig. 2 they are cutting in the direction of the arrows, said cutters being shown in working position in dotted lines. It will be observed that the rear end of each cutter, as indicated at d^7 , is some distance from the peripheral line Z, which indicates the clearance of the heels of said cutters, proper clearance being maintained throughout the use of the same until they are cast aside for want of strength, caused from frequent grinding. The cutters are held in this position by means of the stops c and c' previously referred to, and when necessary to reverse said cutters they are shifted against the opposite sides of said stops c and c' , and that which is considered as clearance at d^7 will disappear, this edge of said cutters will become flush, with the dotted line Z becoming the cutting edge, and d^7 will be indicated at the opposite side or end of said cutters when reversed as d^6 . This clearance d^7 is obtained by means of said cutters D' and D^2 , rolling around said eccentrics e and e' , previously referred to. Said eccentrics e and e' , which are integral, as previously stated, can work equally as well if separate.

It is obvious from the construction of my improved cutters that there is no danger to be apprehended from the same becoming detached from their spindle irrespective of the speed acquired, nor is there any necessity to manipulate them in any respect when necessary to reverse to cut in an opposite direction, as the operator merely reverses the spin-

dle in the ordinary manner, the cutters reversing themselves automatically.

I have provided a sectional cutter, which is bisected and removably secured by dowelpins, as shown in Figs. 10 and 11, which by partially removing nut a^4 the semicircular portion d^{10} can be released from the other portion, being held in place by means of pins d^{11} . This device may have some merits, when frequent grinding of the cutters is required, as a time saver. In Fig. 12 a portion d^9 of the periphery of the pivotal or hinged part has been removed, sufficient arc of contact, however, remaining, which will operate in a similar manner to the cutters previously referred to. Fig. 6 is similar in construction as regards the cutters previously referred to, except as to the action, there being only one cutter D' used at one time and operated by a single eccentric. The opposite cutter D^3 , which is secured to or integral with cutter D' , acts as a counterweight and of course is diametrically opposite said cutter D' . In this case the cutter D^3 is shown, as indicated at D^4 , secured by a pin.

When necessary to use D^3 as a cutter and cutter D' is to be employed as a counterweight, both cutters are removed from the spindle and the counterweight-cutter D^3 is turned around, so that the swell or lobe of the eccentrics will operate upon it in a similar manner as in the present position upon cutter D' . Of course this only occurs when cutter D' becomes too much worn from grinding the same, when it will act as a counterweight. The clearance d^8 between counterweight D^3 and line Z is caused by the single eccentric drawing it away from said line.

Having described my invention, that which I desire to secure by Letters Patent of the United States is—

1. The combination with a spindle of eccentrics, a polygonal opening in said eccentrics through which the spindle passes, said eccentrics passing through the shanks on cutters the whole being constructed and adapted to shift the position of the cutters to operate in either direction of rotation, substantially as described.

2. The combination with a spindle and eccentrics through which the spindle passes, of cutters, shanks on the cutters mounted upon eccentrics, the whole being constructed and adapted to shift the cutters to operate in either direction of rotation substantially as described.

3. The combination with a spindle passing through eccentrics, cutters having shanks surrounding said eccentrics, and stop-pins mounted on a collar for limiting the extreme movement of said cutters, when necessary to operate in either direction of rotation, as described and specified.

4. The combination with a polygonal spindle passing through eccentrics, cutters having shanks surrounding said eccentrics, said cutter-shanks overlapping each other for the

purpose as specified, and stop-pins mounted on a collar for limiting the shiftability of said cutters, when operating in either direction of rotation substantially as described.

5 5. The combination with a spindle passing through eccentrics of the kind as shown and described, cutters having bisected shanks for surrounding said eccentrics, and stop-pins for limiting the extreme shiftability of said cutters, when operated in either direction of rotation, as specified.

10 6. The combination with a spindle passing through eccentrics, cutters having bisected shanks surrounding said eccentrics, said cutter-shanks provided with dowel-pins: stop-

pins for limiting the movement of said cutters when operated in either direction of rotation, as described and specified.

7. The combination with cutters having shanks with annular openings, said cutters 20 embracing by said annular openings, integral eccentrics, and a vertical shaft or spindle passing through said eccentrics for the purpose as shown and described.

In testimony whereof I affix my signature 25 in presence of two witnesses.

HERMAN FLETCHER.

Witnesses:

W. REES EDELEN,
J. ROSS COLHOUN.