(No Model.)

W. A. McCOOL & W. G. ALGEO, Jr.

DRAW PLATE.

No. 567,606. Patented Sept. 15, 1896.

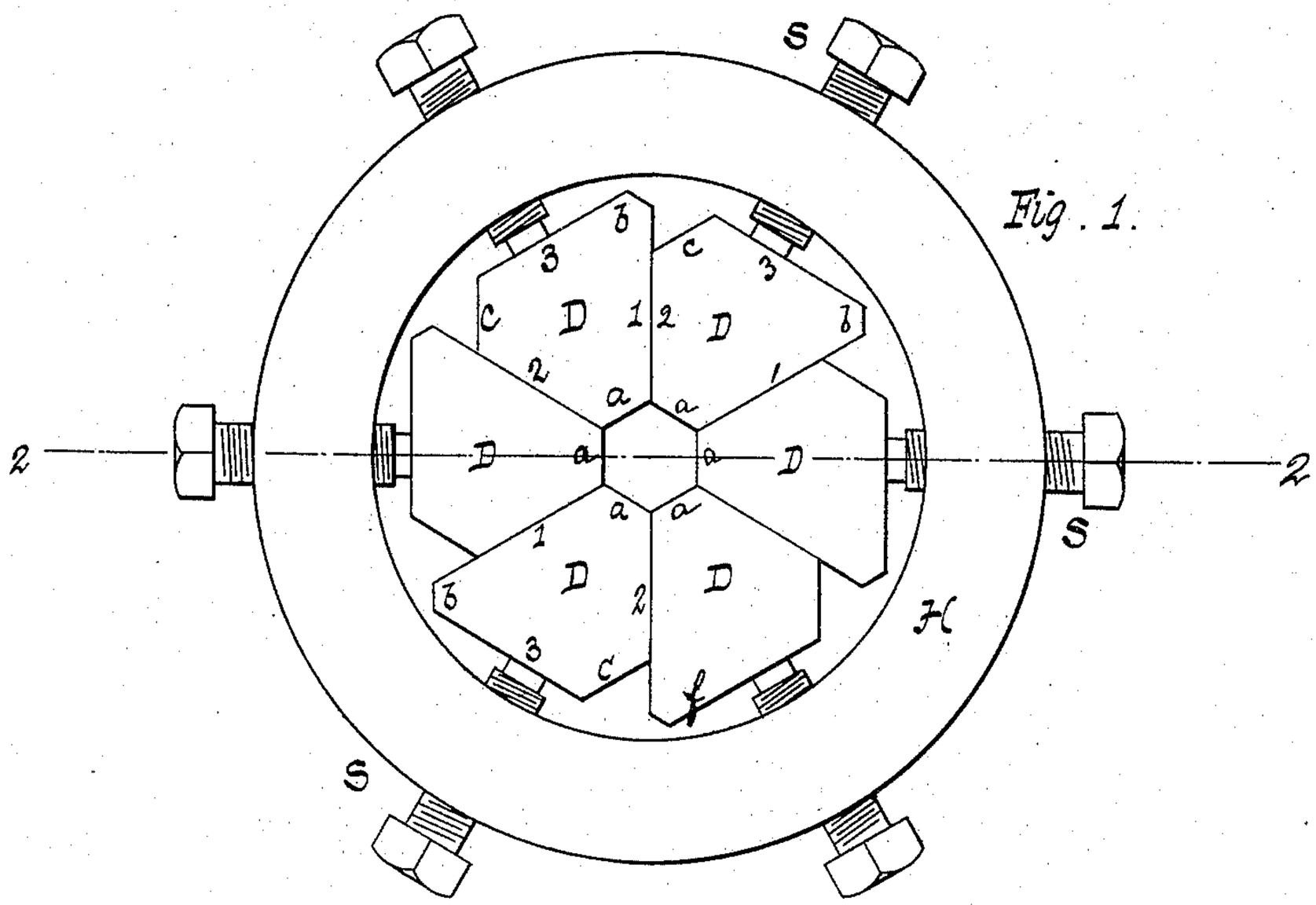


Fig. 1.

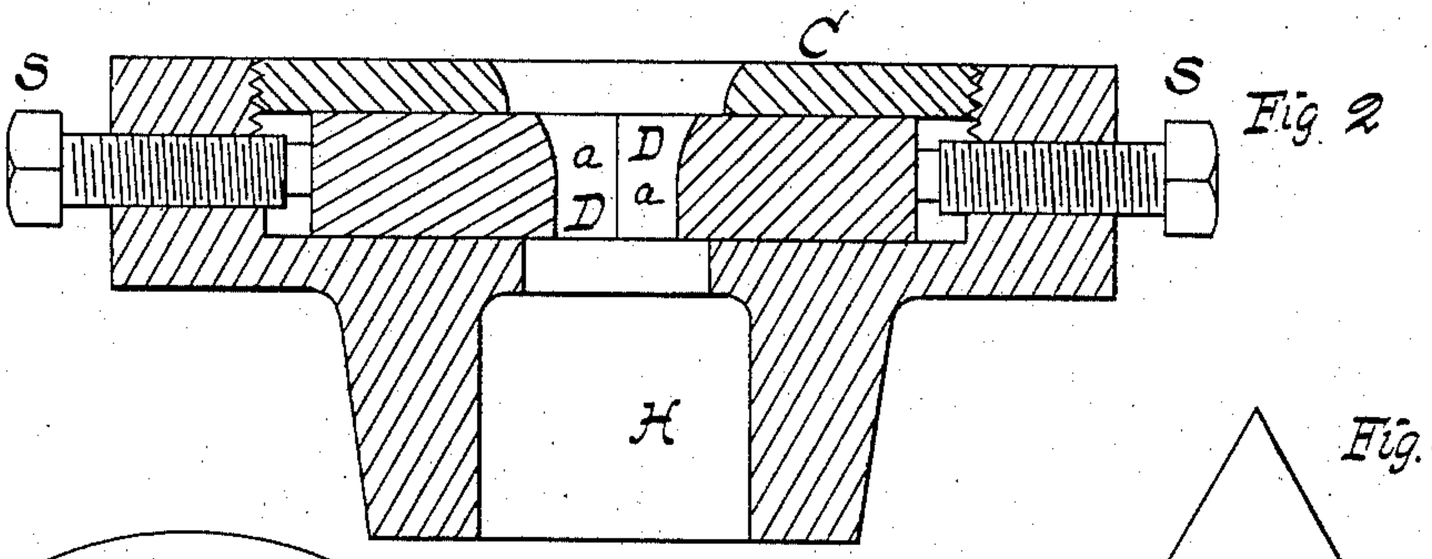
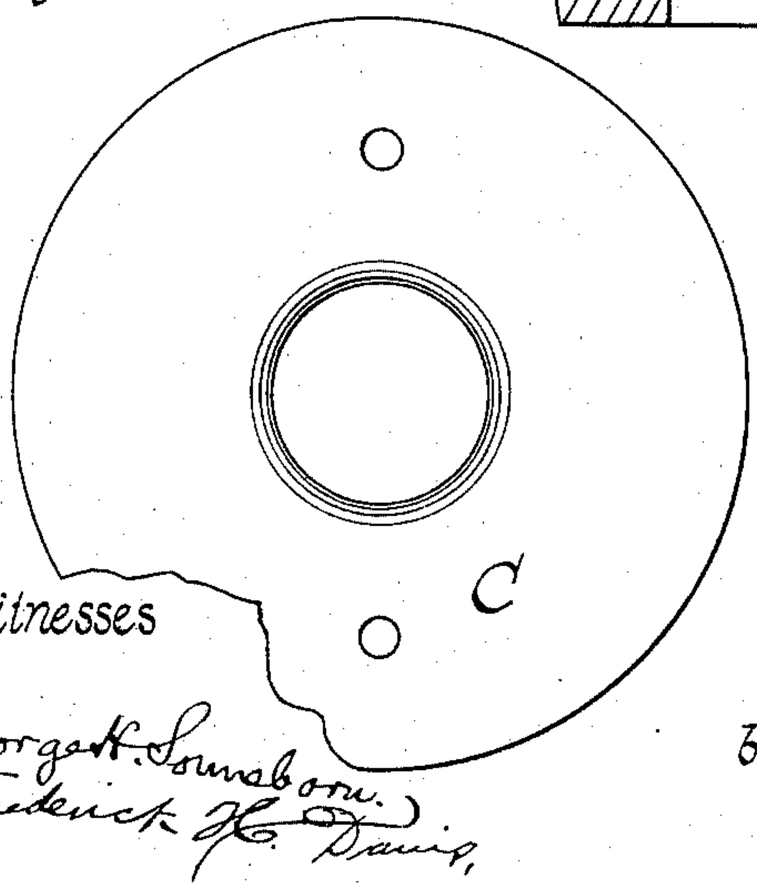


Fig. 2

Fig. 3.



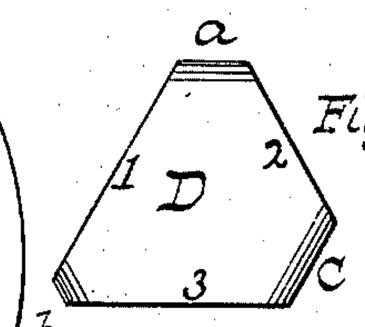


Fig. 5.

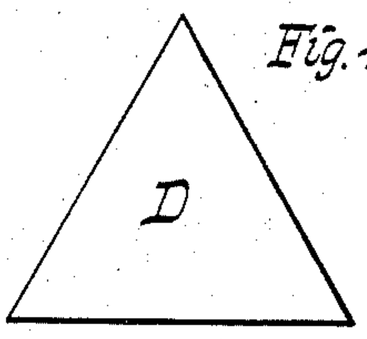


Fig. 4.

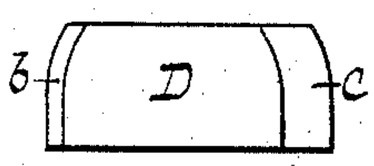


Fig. 6.

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UNITED STATES PATENT OFFICE.

WILLIAM A. McCOOL AND WILLIAM GIBSON ALGEO, JR., OF BEAVER FALLS, PENNSYLVANIA, ASSIGNORS TO THE UNION DRAWN STEEL COMPANY, OF SAME PLACE.

DRAW-PLATE.

SPECIFICATION forming part of Letters Patent No. 567,606, dated September 15, 1896.

Application filed October 22, 1895. Serial No. 566,467. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM A. McCOOL and WILLIAM GIBSON ALGEO, Jr., of Beaver Falls, Pennsylvania, have invented a new and useful Improvement in Draw-Plates, of which the following is a description, referring to the accompanying drawings, which form a part of this specification.

The object of the invention is to produce a die which may be used for fine work where almost absolute accuracy of size is needed, and which may be adjusted to take up or compensate for any wear or enlargement of the die without in any way sacrificing the rigidity of the die as held in the die block or holder, and without necessitating a recutting of the mouth or throat of the die.

To these and certain other incidental purposes, which will hereinafter be more fully set forth, our invention consists of the process or method by which the wear of the die is compensated for, and, in addition, our invention includes the apparatus constructed, arranged, combined, and used substantially in the manner hereinafter described, illustrated, and claimed.

The nature of the invention will be clearly understood from a description of the accompanying drawings, wherein—

Figure 1 is a face view of the draw plate or die secured in position in the die block or holder, but with the annular screw-cap, Fig. 2, removed. Fig. 2 is a cross-section on the plane 2 2 of Fig. 1, but showing the screw-cap in position. Fig. 3 is a plan view of the screw-cap. Fig. 4 is a face view of one of the die-sectors. Fig. 5 is an edge view, and Fig. 6 shows one of the blanks or plates from which the dies are formed.

Throughout the drawings like letters of reference indicate like parts.

If six equilateral triangles are placed together around a common point, they will, as is well known, form a perfect hexagon; and if any one of these six triangles is diminished by cutting a layer from any one side, or from all three sides of it, it may be still fitted into its place without disturbing the others. Following out this principle we have devised a hexagonal die for drawing hexagonal bars and a process of compensating for the wear and consequent enlargement of the die-surfaces.

Fig. 6 shows in face view a plate or blank in the form of an equilateral triangle from which our dies are formed. Figs. 4 and 5 show the completed sector or member of our draw-plate or die. The complete die is shown in Figs. 1 and 2. It will be seen that six of these triangular sectors are placed together with the die-faces *a* placed to form the hexagonal throat or mouth. The curved or flaring form of these die-faces *a* is clearly shown in Fig. 5. The dies are pressed firmly together by means of the six screws S, set around the die-block or die-holder H. This holder is recessed to receive the dies, as shown in the cross-section Fig. 3, and the screw-cap C, threaded in the holder H, retains the dies in place, so that they may be acted upon by the screws S. By means of these screws the dies D may be adjusted so that the die-faces *a* form a perfect hexagon. The two other corners of each die are cut to form smaller or larger dies *b c*, so that each of the dies may be taken out and turned one hundred and twenty degrees to form a different die of greater or less diameter, as desired. The meeting surfaces *f* at the sides of the dies, and which give to each die the form of a perfect equilateral triangle before the die-faces *a b c* are cut, enable the six members of the die to fit together equally well for all three sizes of die. When one of the dies has been in use for a considerable time and has been appreciably worn away and enlarged, the dies are taken out of the holder and one of the surfaces *f* of each sector or member is carefully planed off, so that when the dies are replaced the worn faces *a* will again form a hexagon of the correct size without requiring any recutting of these surfaces *a*. For instance, if the diameter of the throat or mouth of the die has been enlarged two one-thousandths of an inch, and it is desired to correct this, one one-thousandth of an inch may be cut away from one of the meeting surfaces of each member of the die, which will cause a reduction of two one-thousandths in the diameter of the hexagon.

If the surface *f*, which is numbered 1 in Fig. 1, is cut away from each die, it is clear

that it will allow the die-faces *a* to come closer together in the manner just described and reduce the size of the throat or mouth formed by these faces *a;* but it is apparent that since the surfaces 2 and 3 are untouched the die-face *c* between these two surfaces will be in no way affected and the size of the hexagonal throat, which these faces *c* are adapted to form, will not be altered in size. It is therefore clear that with the triangular form of sector which I have shown two die-faces may be cut on each sector, and either of these may be adjusted by planing off the side of the sector to compensate for wear without in any way affecting the other die-face. It is also clear that with the triangular form of die-sector shown there will always be presented to the screws S a perpendicular bearing-face, and the screws S will therefore always act properly in compressing the dies and forcing them rigidly into proper adjustment.

In its broader aspect the invention may be applied to dies divided into four, eight, or other number of sections or sectors, but when this is the case the dies will not be reversible in the same manner, but a single die-face can be formed on each sector. However, the same process of cutting away and adjusting to compensate for wear may be employed with the same results as described above.

In applying the term "sector" to describe our die members we have used the word in its obvious analogy to the sector of a circle, and we mean thereby a part or member having sides which lie in two planes *f*, inclined to each other and both cutting the throat of the die. The word "sector" is used to succinctly express this relation. It is the angle or point produced by the meeting of these inclined sides *f* that is cut away to form the throat *a* of the die.

Having now set forth our invention, we claim as new, and desire to secure by these Letters Patent of the United States, together with such variations as may be made by mere skill in the art and with only such limitations as are expressed or by law implied in view of the related arts, as follows:

1. In combination in a draw-plate or die, two or more dies or die members fitted together and each provided with a die surface or face forming the throat or mouth of the die, the said members being of angular or sector-like form and the said die-surface being formed across the entering angle whereby when the several members are in place a rigid and unadjustable die is produced, a die-holder or die-block therefor, and means for holding the said dies together in the said holder, substantially as set forth.

2. In combination in a draw-plate or die, the die-block or die-holder II and the die consisting of the six sector-like parts D, each constituting an equilateral triangle having one or more of its corners cut away to form the face or throat of the die, substantially as set forth.

3. In combination in a draw-plate or die, the die-plate or die-holder II and the die consisting of the sector-like parts D fitted together and each being reversible and having two or more die-faces forming the throat of the said die, whereby two or more dies may be thereby formed, substantially as set forth.

4. A reversible die member or part, provided with two or more die-faces (as *a* and *b*) and with sides (as *f*) the said sides being at such angle to each other that each of said die-faces forms with the adjacent sides a wedge-shaped or sector-like die member, whereby the said die member or part may be reversed to present either the face *a* or the face *b* in an invariable and rigid relation substantially as set forth.

5. As an improvement in draw-plates or dies, the die having one or more removable wedge-shaped or sector-like members or parts provided with a die surface or face (as *a*) formed across and cutting off the angle of such wedge or sector, whereby the said member or part may be removed and replaced with perfect rigidity and accurate registering, substantially as set forth.

In testimony whereof we have hereunto set our hands, at Beaver Falls, Pennsylvania, this 16th day of October, A. D. 1895.

WILLIAM A. McCOOL.
WILLIAM GIBSON ALGEO, JR.

In presence of—
F. N. PEEGLE,
JOS. O. ROUZER.