(No Model.) 2 Sheets—Sheet 1.

B. HAIGH.

HAND TOOL FOR CUTTING HOLES IN METAL PLATES.

No. 547,665. Patented Oct. 8, 1895.

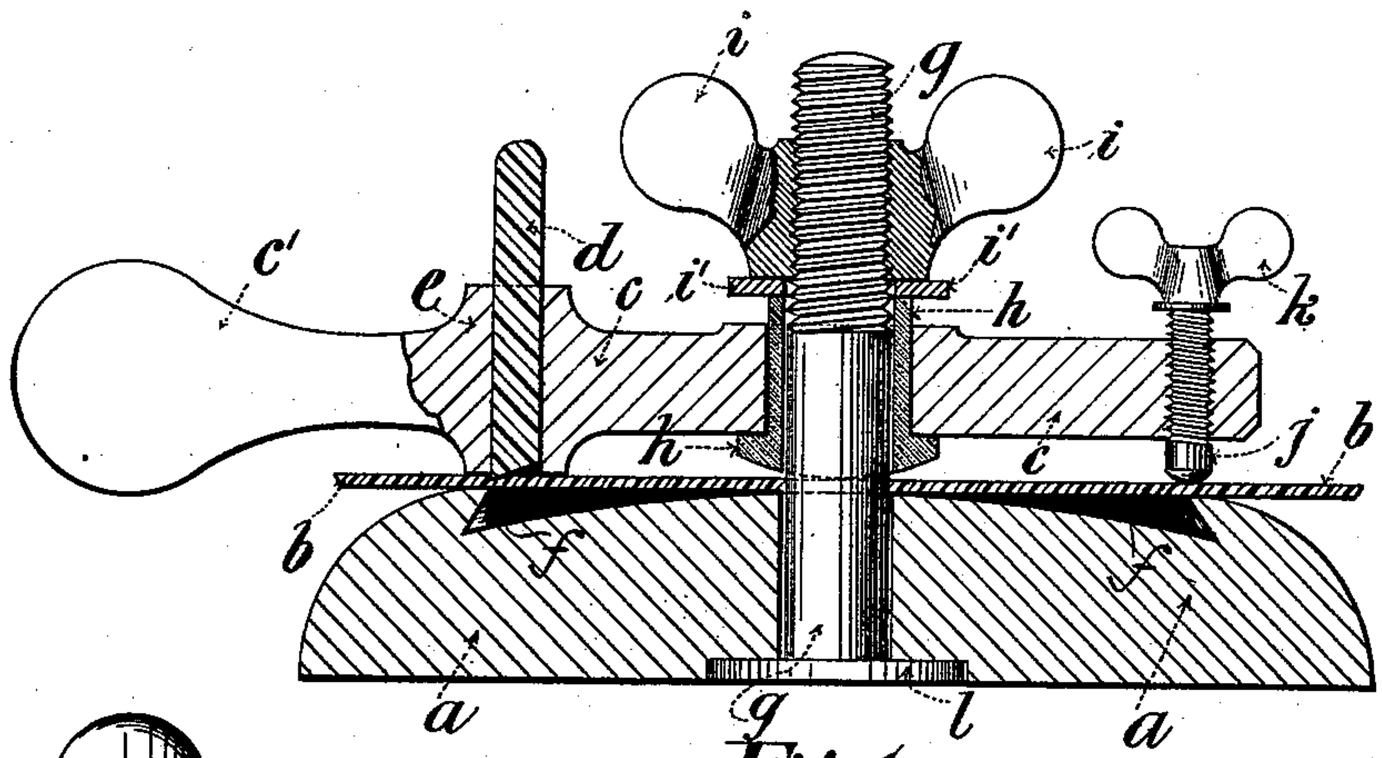

Fig. 1

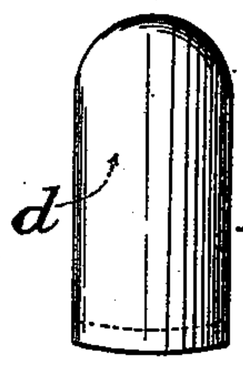

Fig. 3

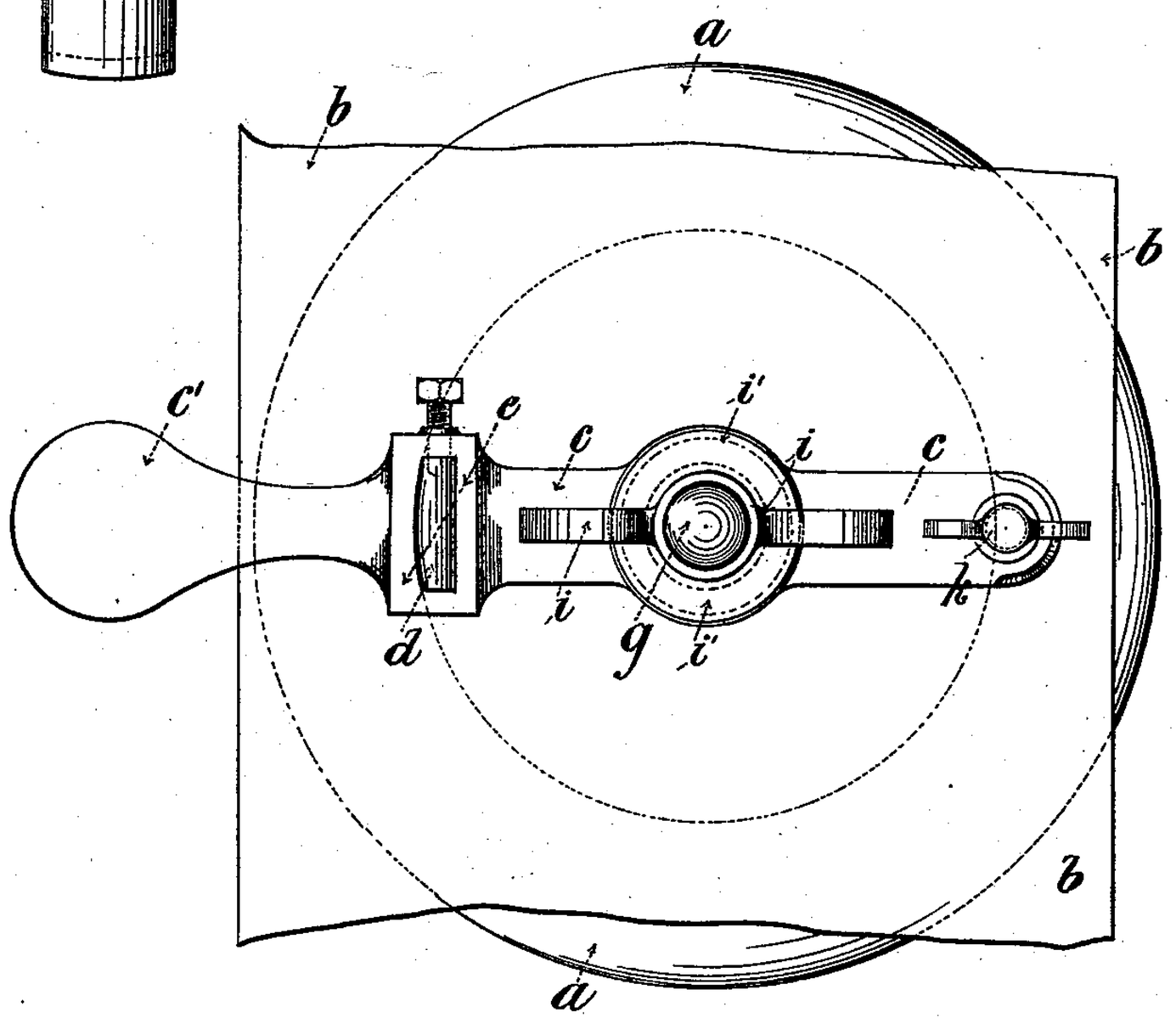

Fig. 2

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(No Model.) 2 Sheets—Sheet 2.

B. HAIGH.

HAND TOOL FOR CUTTING HOLES IN METAL PLATES.

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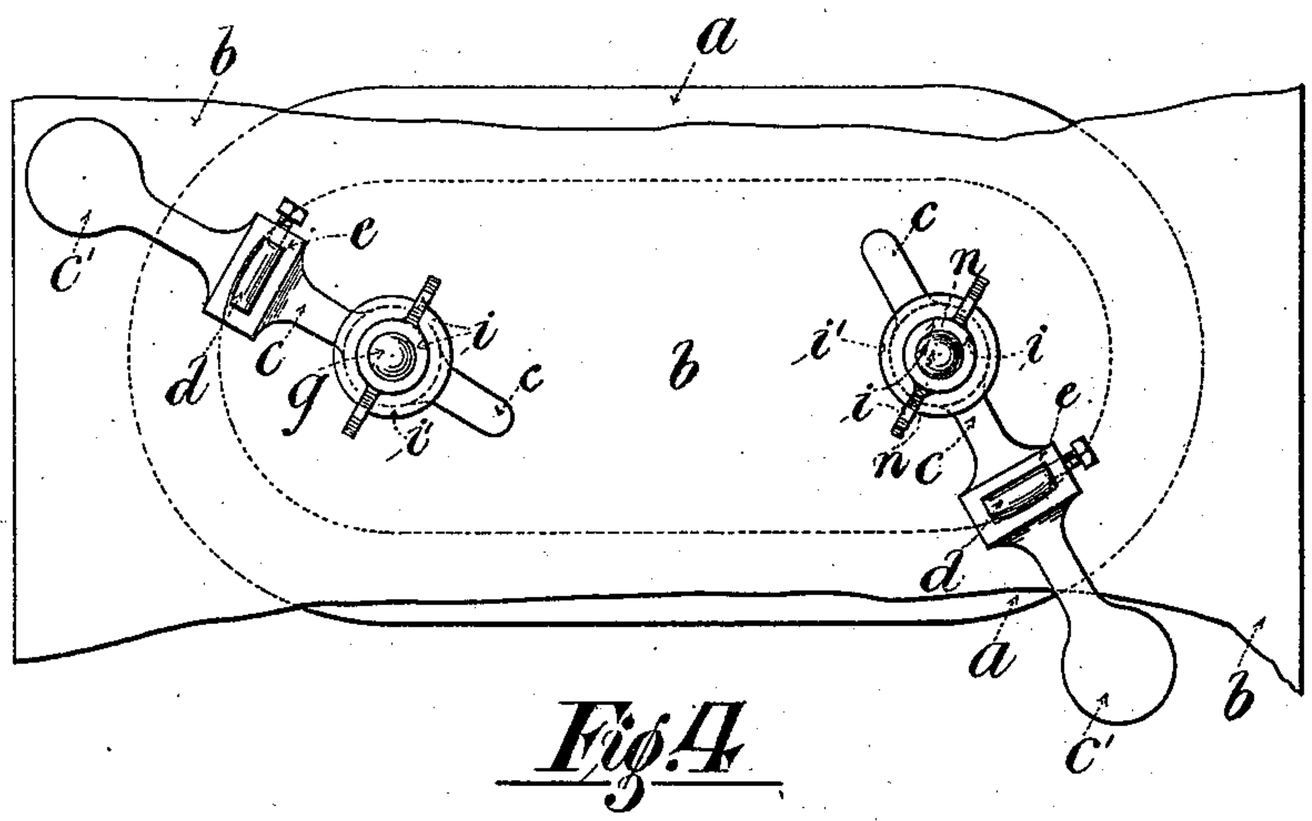


Fig. 4.

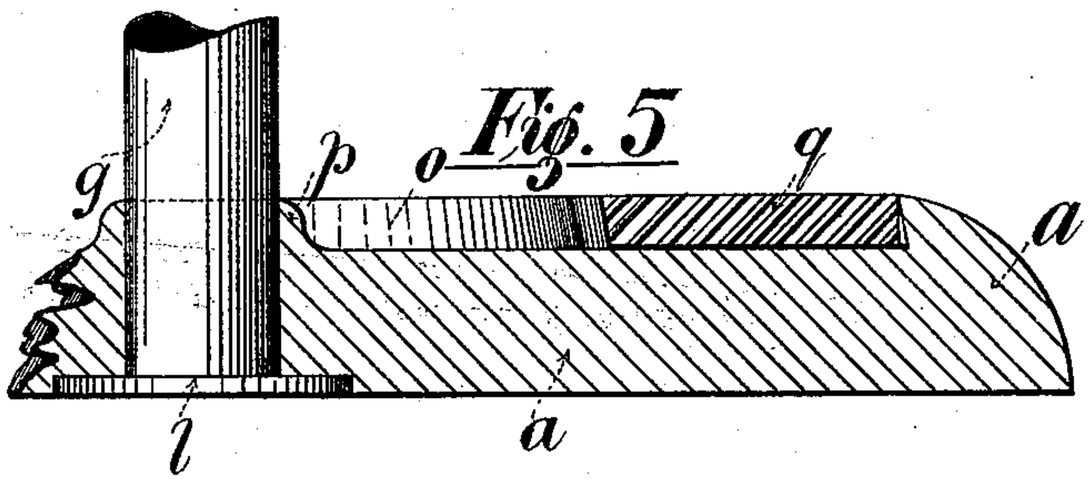
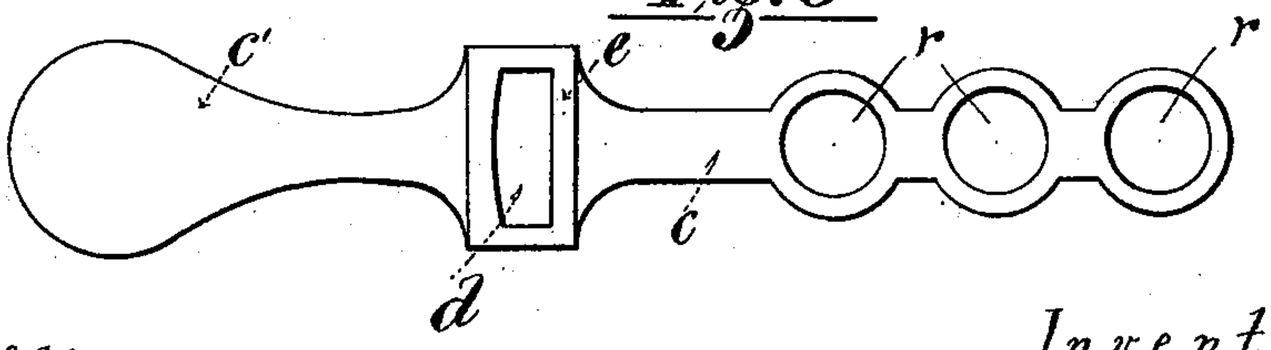


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

BENJAMIN HAIGH, OF LONDON, ENGLAND, ASSIGNOR TO GEORGE SONNENTHAL, OF SAME PLACE.

HAND-TOOL FOR CUTTING HOLES IN METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 547,665, dated October 8, 1895.

Application filed December 21, 1893. Serial No. 494,301. (No model.) Patented in England January 30, 1893, No. 2,017; in Germany December 6, 1893, No. 76,953; in Austria-Hungary December 12, 1893, No. 67,251; in Switzerland December 20, 1893, No. 8,025; in Italy December 20, 1893, No. 35,442; in France December 20, 1893, No. 234,945, and in Belgium December 20, 1893, No. 107,751.

To all whom it may concern:

Be it known that I, BENJAMIN HAIGH, plumber, a subject of the Queen of Great Britain and Ireland, residing at Pleasant Villa, Plashett Grove, East Ham, London, in the county of Middlesex, England, have invented a certain new and useful Hand-Tool for Cutting Holes in Strong Steel or other Metal Plates, (for which I have obtained patents in Great Britain, No. 2,017, dated January 30, 1893; in Switzerland, No. 8,025, dated December 20, 1893; in Italy, No. 35,442, dated December 20, 1893; in Germany, No. 76,953, dated December 6, 1893; in France, No. 234,945, dated December 20, 1893; in Belgium, No. 107,751, dated December 20, 1893, and in Austria-Hungary, No. 67,251, dated December 12, 1893,) of which the following is a specification.

This invention is designed to supply an easy method of cutting out round or circular holes or disks in metal or other hard substances.

It consists of a circular or oblong block of steel or other suitable material, which may be formed whole or in adjustable sections and may be of any suitable size. In this block a recess or die, either circular or with circular ends, is formed of any required depth, the inside face of the recess being made with a true or cutting edge, and the diameter being the same as that of the hole or disk required to be cut in or from the sheet of metal. Through the center of this block a vertical pin or bolt passes, on which slides a flanged collar or sleeve. Around this collar and resting on the flange at the lower end thereof is fitted a horizontal bar, on the outer end of which is a handle. One or more sockets are made in this bar to carry a vertical cutter. The flanged collar serves to keep the sheet of metal in place when being operated upon, and it is tightened by means of a fly-nut on the upper end of the bolt. It will be seen that the principle of the invention is very simple—namely, a horizontal arm carrying a vertical cutter revolving around a fixed center pin or pivot upon a suitable die or base-plate.

I will now describe the invention with reference to the accompanying drawings, in which—

Figure 1 shows a sectional elevation of my cutting-tool. Fig. 2 shows a plan view of the same. Fig. 3 shows a front elevation of the cutter or cutting-blade only. This blade in cross-section corresponds with the hole or socket *e*. Fig. 4 shows a plan view of my cutting-tool applied to cutting the curved end of oblong holes, two working centers being used instead of one. Fig. 5 shows half of a sectional elevation of a block constructed to receive loose annular concentric cutting-rings of different diameters inside the recess of the fixed block *a*, in order to cut circles of different sizes. If preferred, the concentric cutting-edges can be formed solid with the block itself. It will be observed that the cavity *o* is flat, with a boss *p* around the center bolt-hole. *q* is a loose annular cutter. Fig. 6 shows a plan view of the bar *c* with three center holes for receiving the center pivot *g* when concentric cutting-rings are employed, as in Fig. 5.

a is the block or base of my apparatus.

b is the sheet of metal to be cut.

c is the handle-bar, in which is the socket *e*, which carries the cutter *d*.

c' is the handle, which may, if preferred, be crutch shape or of any preferred form suitable for the purpose.

d is the vertical cutter or cutting-blade formed with a convex face. This may be formed, as in some cases, with a revolving wheel-cutter, if preferred. *e* is the socket for holding the cutter.

f is the recess or die in block *a*.

g is the bolt forming the center pivot, on which the cutter-bar works.

h is a sliding collar or sleeve, which, by means of the fly-nut *i* and with or without a washer *i'*, secures the rotating bar *c* and keeps the plate of metal in place to be acted on by the cutter *d*.

i is the fly-nut for adjusting the sleeve *h*.

j is a small screwed pin, which passes on through the outer end of the handle-bar *c* and serves as a gage for the cutting-tool. It can

be fitted with a wheel or roller, if preferred. It also equalizes the pressure on either side of the center pivot *g* and helps to keep the plate level.

k is a small thumb-bit for operating or adjusting the pin *j*.

l is the head of the vertical bolt *g*.

m is the cutting-edge of the recess *f*, which, with the vertical cutter *d*, forms the cutting part or shears of the tool.

n is an auxiliary working center. (See Fig. 4.)

o is the bottom of the recess *f*.

p is a boss in the center of *o*, forming a support to the material being cut.

q is a loose steel ring forming an additional die or matrix of different diameters to that formed on the block *a*.

When the machine is to be used as a circular-hole cutter, the mode of operation is as follows: The sheet of metal or other material *b* is perforated to pass over the bolt *g* and is then placed upon the die *f*, and the collar *h* and bar *c* are put on and the sleeve is tightened up by means of the fly-nut *i*, which keeps the whole in place. The bar *c* is then caused to revolve on the sleeve *h* around the central pivot *g* by means of the handle *c'*, carrying the cutter *d* with it at a distance from the center corresponding to that of one of the cutting-edges *m*. It thus quickly effects a cut in the sheet *b*, and if, by reason of the hardness or thickness of the material operated on, the process is not fast enough any suitable leverage or force may be applied to the cutter *d*. For example, the head of the cutter may be struck with a hammer or the bar may be weighted. It will be seen that if the back side of the cutter *d* be made slightly arched or convex it will describe a clean and true circle in either direction without excessive friction; but, if preferred, revolving cutters may be employed. I also prefer to make the face or sharp edge of the cutter convex; but any other shape can be used, or it may be serrated, if desired.

Referring to Fig. 4, this shows a means by which oblong holes may be cut. It consists of employing two sets of my cutting mechanism working on separate centers *s n* and on an oblong die-base. One of the centers is placed at each end of the oblong die. Instead of turning the handles right around they are turned only half around, the half circles thus formed being concave to each other. When this is done, all that is necessary is to cut out the remaining straight line between the ends of the two half circles with a chisel or other suitable tool.

It is obvious that on a large base-block open concentric horizontal cutting-edges may be inserted, as shown in Fig. 5, and the cutter-bar may have corresponding center holes or sockets *r*, as shown in Fig. 6, for adjusting the vertical cutters, so as to cut several sizes of circles with the same instrument.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A circular cutting tool for metal and like purposes, consisting of a block or base, formed with a recess provided with a cutting edge, a rotating arm provided with a cutting blade adapted to travel in a line co-incident with said cutting edge, substantially as described.

2. A circular cutting tool for metal and like purposes, consisting of a block or base formed with a recess provided with a circular cutting edge, a pivot formed upon said base, a rotating arm mounted upon said pivot and a cutting blade carried by said arm and adapted to travel in a line co-incident to the cutting edge of said base, substantially as described.

3. In a circular cutting tool, the combination of a block or base provided with a cutting edge, a pivot formed upon said base, a sleeve mounted on said pivot, a rotating arm pivoted upon said sleeve, means for causing said sleeve to hold in place the material to be cut, a cutting blade mounted upon said arm to one side of said pivot, and a guide pin mounted thereon to the opposite side of said pivot, substantially as described.

4. In a circular cutting tool, the combination of the base or block formed with a recess, of a concentric disk provided with a cutting edge and fitting in said recess, a pivot upon said block, a rotating arm carrying a cutting blade mounted upon said pivot, substantially as described.

5. In a circular cutting tool, the combination with the block provided with a recess having a cutting edge, a pivot upon said block, a rotating arm carrying a cutting blade and provided with a series of apertures any one of which is adapted to fit upon said pivot so as to vary the distance of the cutting blade from the pivot, substantially as described.

Signed at London, in the county of Middlesex, England, this 24th day of November, A. D. 1893.

BENJAMIN HAIGH.

Witnesses:
HENRY E. DOD,
S. S. BROMHEAD.