(No Model.) 2 Sheets—Sheet 1.

F. A. HUMPHREY.

TEMPORARY CENTER AND TEMPLET INSTRUMENT.

No. 346,048. Patented July 20, 1886.

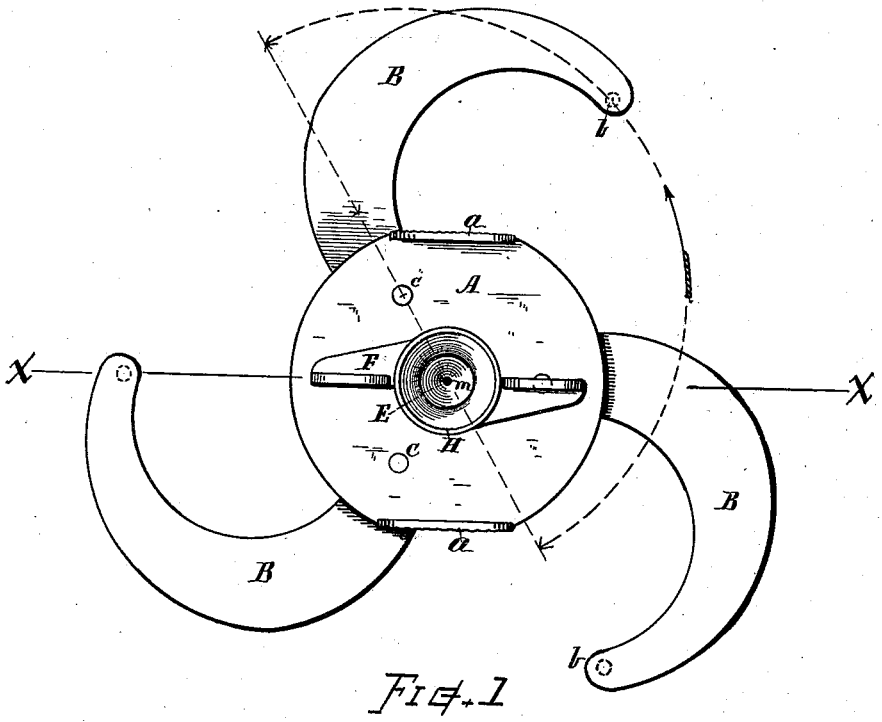

FIG. 1

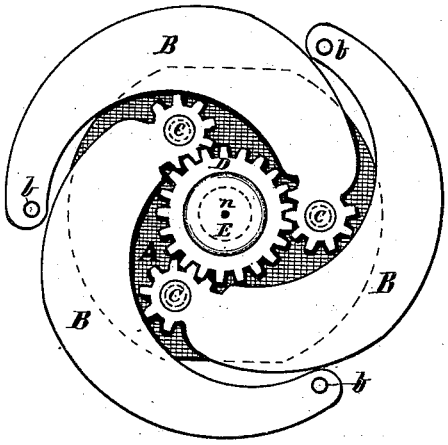

FIG. 2

WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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TEMPORARY CENTER AND TEMPLET INSTRUMENT.

No. 346,048. Patented July 20, 1886.

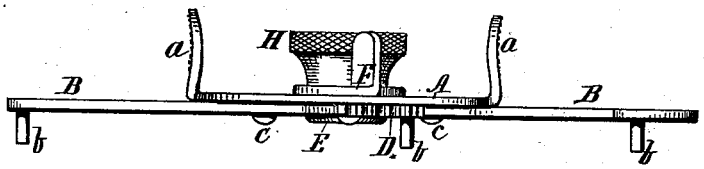

Fig. 3

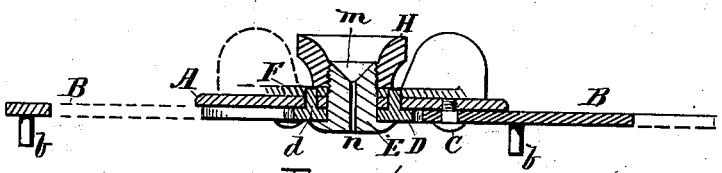

Fig. 4

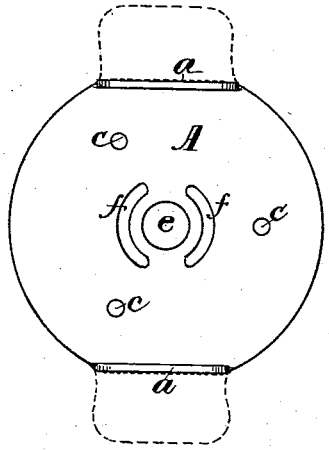

Fig. 5

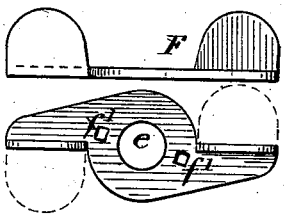

Fig. 6

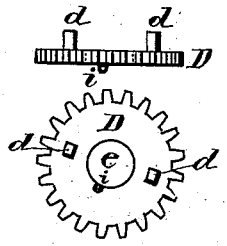

Fig. 7

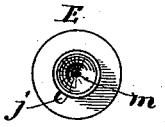

Fig. 8

WITNESSES.

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UNITED STATES PATENT OFFICE.

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TEMPORARY CENTER AND TEMPLET INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 346,048, dated July 20, 1886.

Application filed March 31, 1886. Serial No. 197,305. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HUMPHREY, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Temporary Center and Templet Instruments, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of this my present invention is to provide a practical and convenient tool for the use of pattern-makers, wood-workers, machinists, and other mechanics, for finding, establishing, and maintaining a center within a cavity, circle, or opening from which to work with dividers, compasses, or other tools, in the operation of laying out or perfecting their work; also to afford a tool that can be used for other centering purposes, outside or inside, and as a templet for assistance in measuring and forming cavities or interior spaces in different parts of mechanical work. These objects I attain by mechanism constructed and organized for operation, as herein illustrated and described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a top view of a center and templet tool constructed in accordance with my invention, showing the arms expanded or open. Fig. 2 is a bottom view of the same, showing the arms as closed. Fig. 3 is a side view. Fig. 4 is a central vertical section at line *x x*, Fig. 1. Figs. 5, 6, 7, and 8 show details of parts of the tool separated.

In referring to parts, A denotes a central supporting plate or frame having at its center the indent, stud, or centering-mark, and provided with thumb-pieces or handles *a* at its periphery, whereby it can be conveniently held between the thumb and finger of one hand.

B B B indicate a series of curved arms, respectively pivoted to said plate by suitable studs, *c*, eccentric to but at uniform distances from the center thereof, and from each other. The outer ends of the arms are furnished with downwardly-projecting points or cylindrical pins *b*. Said arms are adapted to swing in the arcs of circles of about one hundred and eighty degrees, (more or less,) as indicated by dotted line on Fig. 1 of the drawings, for carrying the points or pins *b* through an expanding area from the least to the greatest limit in the capacity of the instrument.

D indicates a centrally-disposed wheel having gear-teeth that mesh with teeth formed on the inner ends of the respective arms B, whereby all of said arms can be simultaneously and uniformly operated or adjusted by rotative action of said wheel.

E indicates the center stud, F the thumb-bar or handle for turning the gear, and H the clamp-nut for retaining the parts at position of adjustment.

The plate A is made, substantially as indicated in Fig. 5, of suitable material, or preferably punched from sheet metal as a circular disk with side parts extended, as per dotted lines, which parts are afterward bent up to form the handles or thumb-plates *a a*, the outer surfaces of which may be roughened or checked to prevent their slipping from the hand. The plate A has a central opening, *e*, for the center stud, E, and concentric therewith are provided curved slots *f* for the operating parts.

The gear-wheel D is located beneath the plate A. It is mounted on the center stud, E, and is furnished with studs or connecting-pins *d*, that extend up through the slots *f* and engage with recesses *f'* in the thumb-bar F, so that rotation of said thumb-bar effects the rotation of said gear. The gear D is provided with a lug, *i*, that engages with a recess, *j*, in the head of the stud E, whereby said stud is caused to rotate with the gear and thumb-bar, (see Figs. 7 and 8,) to prevent the unscrewing of the clamp-nut H by the rotative movement when adjusting the tool. The thumb-bar F is preferably made as in Fig. 6, stamped from sheet metal, as indicated in dotted lines, and the parts bent up to form the thumb-plates.

The stud E is provided with an indent or central depression, *m*, in its upper end, (see Fig. 4,) and with a small hole, *n*, extending through its axis. This depression and hole constitute the center or indicating-point from which the work is laid off.

The nut H is made cup-formed, and screws onto the threaded end of the stud E and against the thumb-bar F, for clamping the thumb-bar F, plate A, and gear D between said nut and the head of the stud.

In lieu of making the parts of sheet metal by punching and bending, they may be cast or otherwise formed of any suitable material, if preferred.

The manner of using my improved cavity-center is as follows: When it is desired to lay off a circle upon the work with dividers or compasses and the center falls at the center of a hole or cavity where there is no available support, then the operator, taking the tool in his hand by the thumb-plates *a*, places it over the cavity, and with his other hand swings the thumb-bar F, which effects the operation of the gears, and thereby expands or opens the arms B until the points *b* press the edges of the cavity. He then clamps the devices by a turn of the nut H and leaves the two supported within and bridging the cavity, when he can lay off the desired circles by placing the foot of the compass in the depression *m*, which is the desired center established and maintained in the manner set forth.

An outside center on the end of a cylinder or hub can in similar manner be found and provided for by closing the points *b* onto the periphery of said cylinder end, and then clamping the devices to maintain the instrument in position thereon. The tool can also be used for finding the center at the bottom of a cylindrical cavity by expanding the arms B until their outer surfaces strike the interior of the cylinder, then pricking the center by means of a point or marker inserted through the hole *n*. The tool can also be used as a templet for gaging and measuring cavities, spaces, and forms for a variety of purposes, especially in turning and forming pattern-makers' work, and is adapted for circular, elliptical, triangular, and other polygonal openings, and it will give the true center of all forms of openings having equilateral sides corresponding with the number of the arms in the tool.

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

1. A tool for establishing and maintaining a center over or within a cavity, provided with a series of eccentrically-pivoted swinging arms uniformly adjustable about a central disk or plate supporting an axially-disposed center or indent, which is adapted to receive the foot of a compass or similar tool, substantially as hereinbefore set forth.

2. A tool for finding and establishing a center, consisting of a central plate or frame supporting an indent or center-mark, a series of swinging arms eccentrically pivoted to said plate and uniformly adjustable by means of a centrally-disposed gear, means for rotating said gear upon the plate, and a clamping device for retaining the parts at position of adjustment, substantially as set forth.

3. The combination of the plate A, the curved arms B, pivoted on said plate, and provided with pins *b*, the gear-wheel D, the thumb-bar F, connected with said gear-wheel, the central stud, E, having an indent or centering-point, and the clamping-nut H, substantially as and for the purposes set forth.

4. The plate provided with the curved slots *f*, the wheel having studs *d* projecting through said slots, and the thumb-bar F, having recesses *f'*, in combination with the arms B and clamping devices, as and for the purpose set forth.

5. In a centering-tool, the arms B, curved in the manner shown, and expanding or swinging outward beyond the periphery of the supporting center or plate, as set forth, whereby the outer edges of said arms are substantially circular and the tool adapted for use as a templet, as set forth.

6. In combination with the plate A, having slots *f*, thumb-bar F, and clamp-nut H, the gear-wheel having the lug *i* and studs *d*, and the center stud, E, provided with a recess for engaging said lug, whereby said center stud is caused to rotate with said gear and thumb-bar, substantially as and for the purpose set forth.

Witness my hand this 27th day of March, A. D. 1886.

FRANK A. HUMPHREY.

Witnesses:
CHAS. H. BURLEIGH,
HERBERT P. BARTON.