

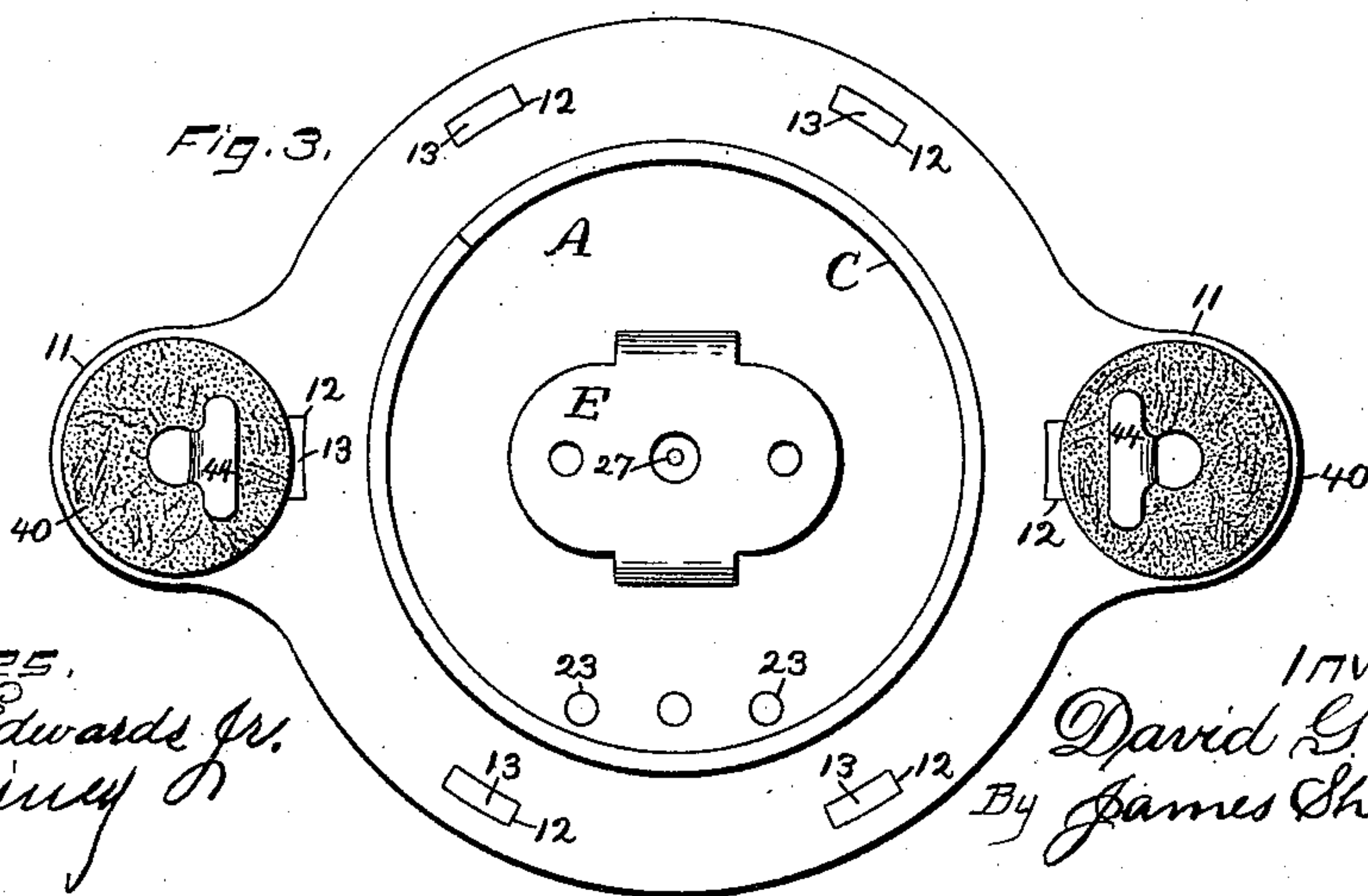
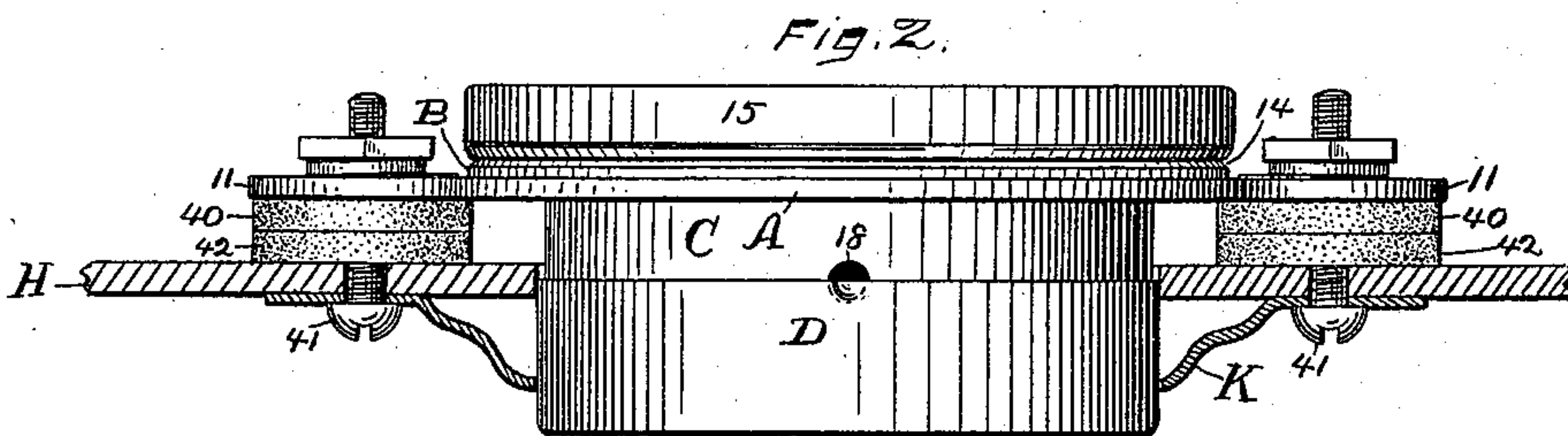
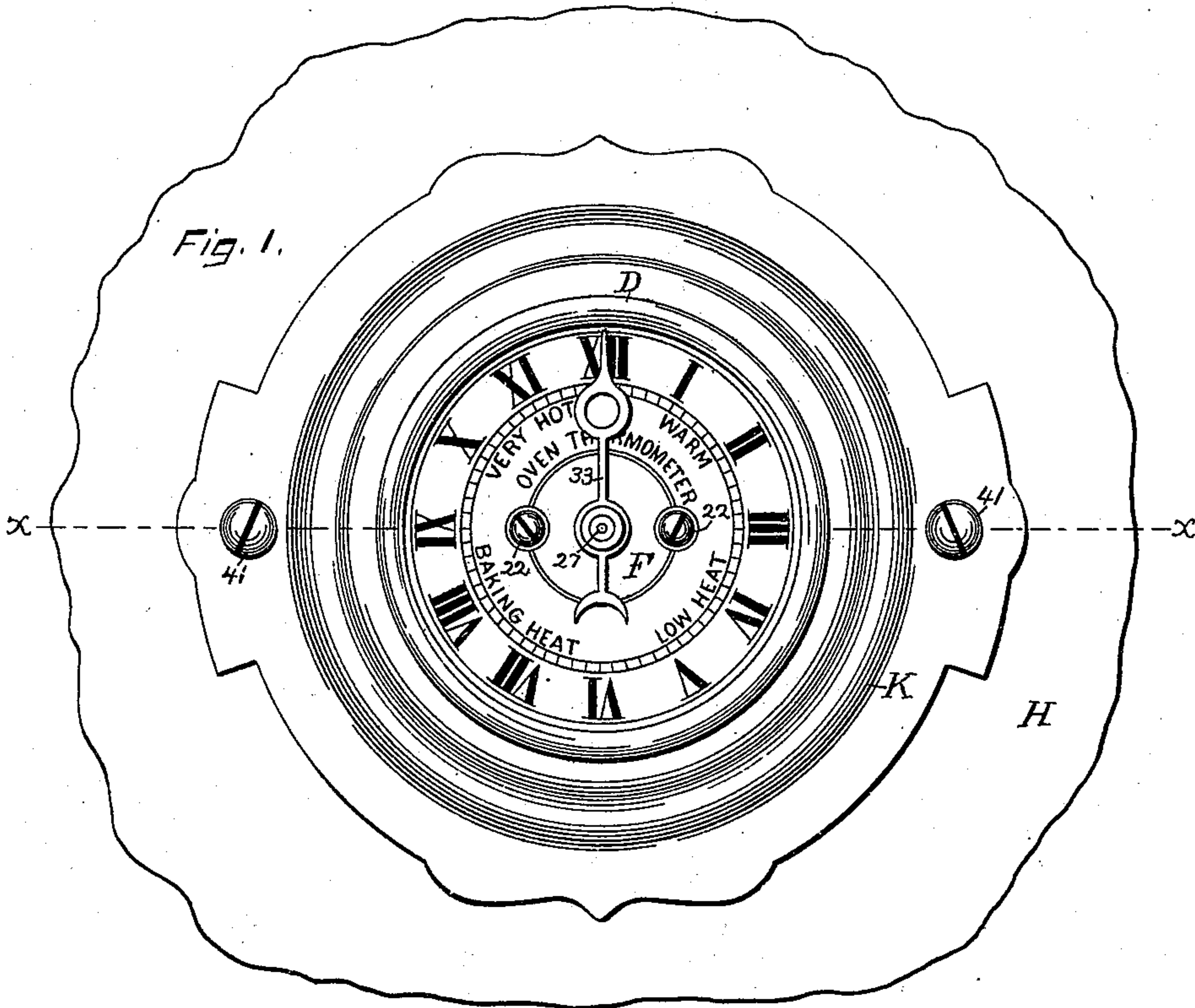
(No Model.)

2 Sheets—Sheet 1.

D. G. COOPER.
OVEN THERMOMETER.

No. 447,129.

Patented Feb. 24, 1891.



Witnesses,
John Edwards Jr.
J. O. Drury

INVENTOR,
David G. Cooper.
By James Shepard
Atty.

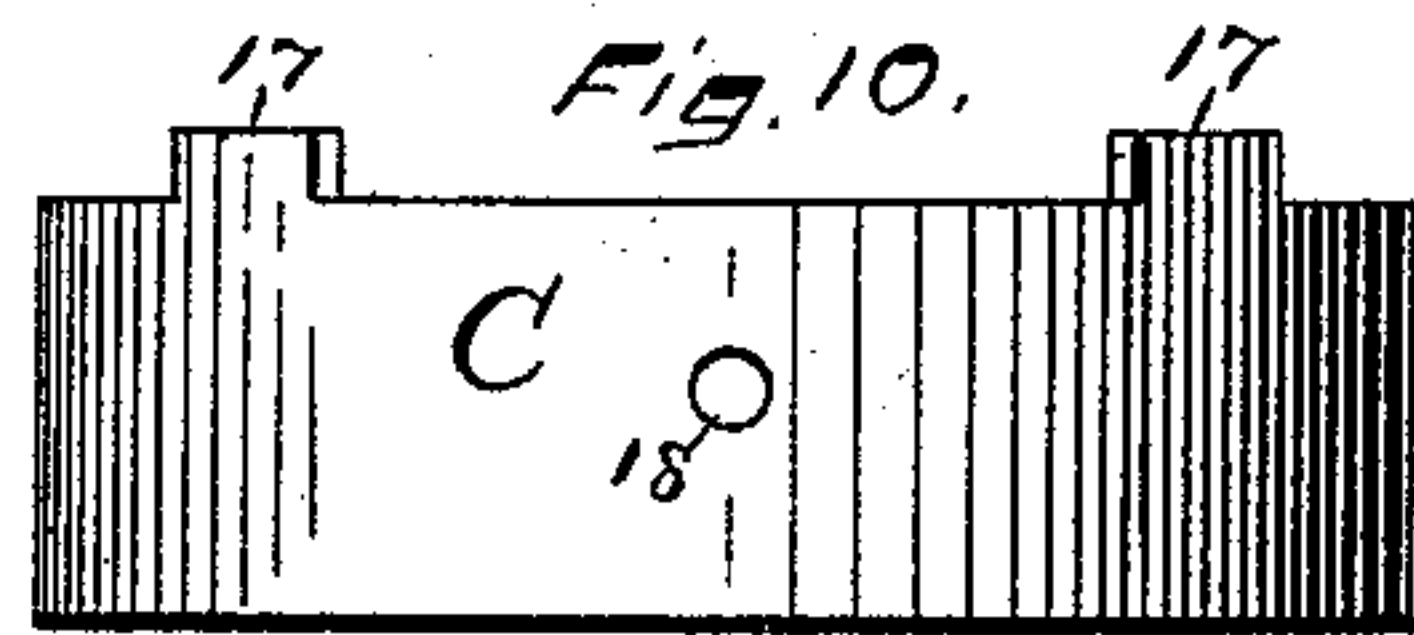
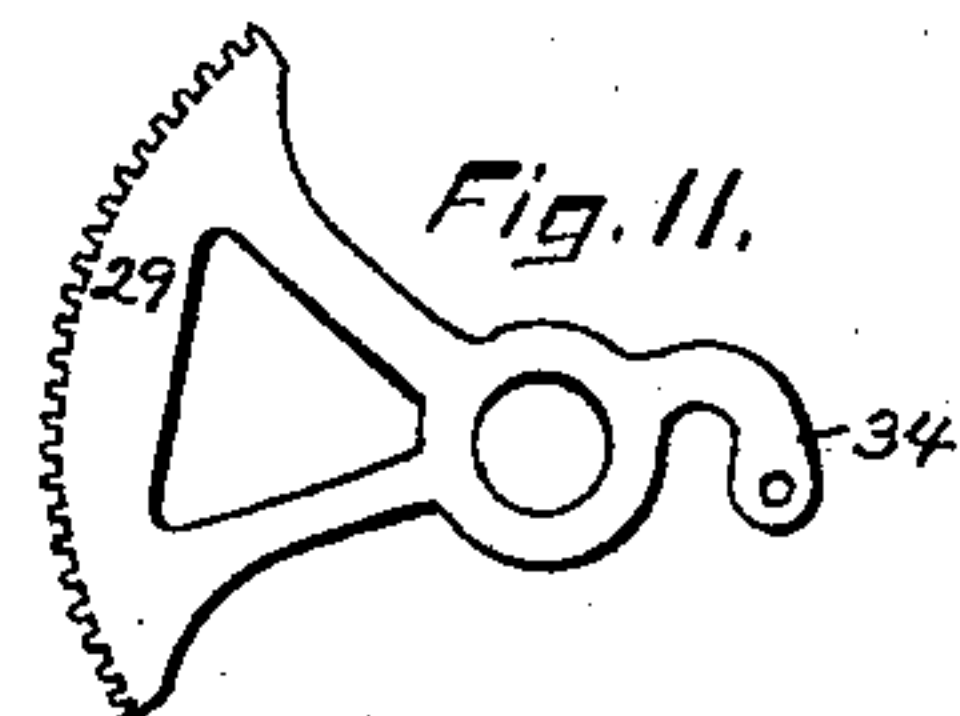
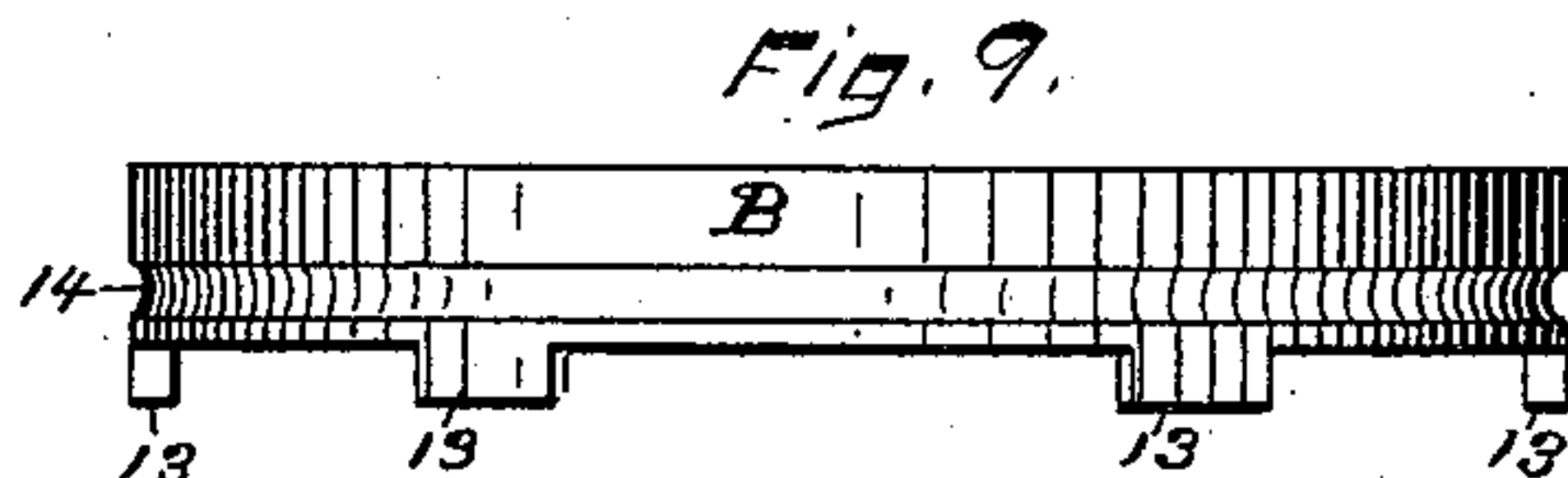
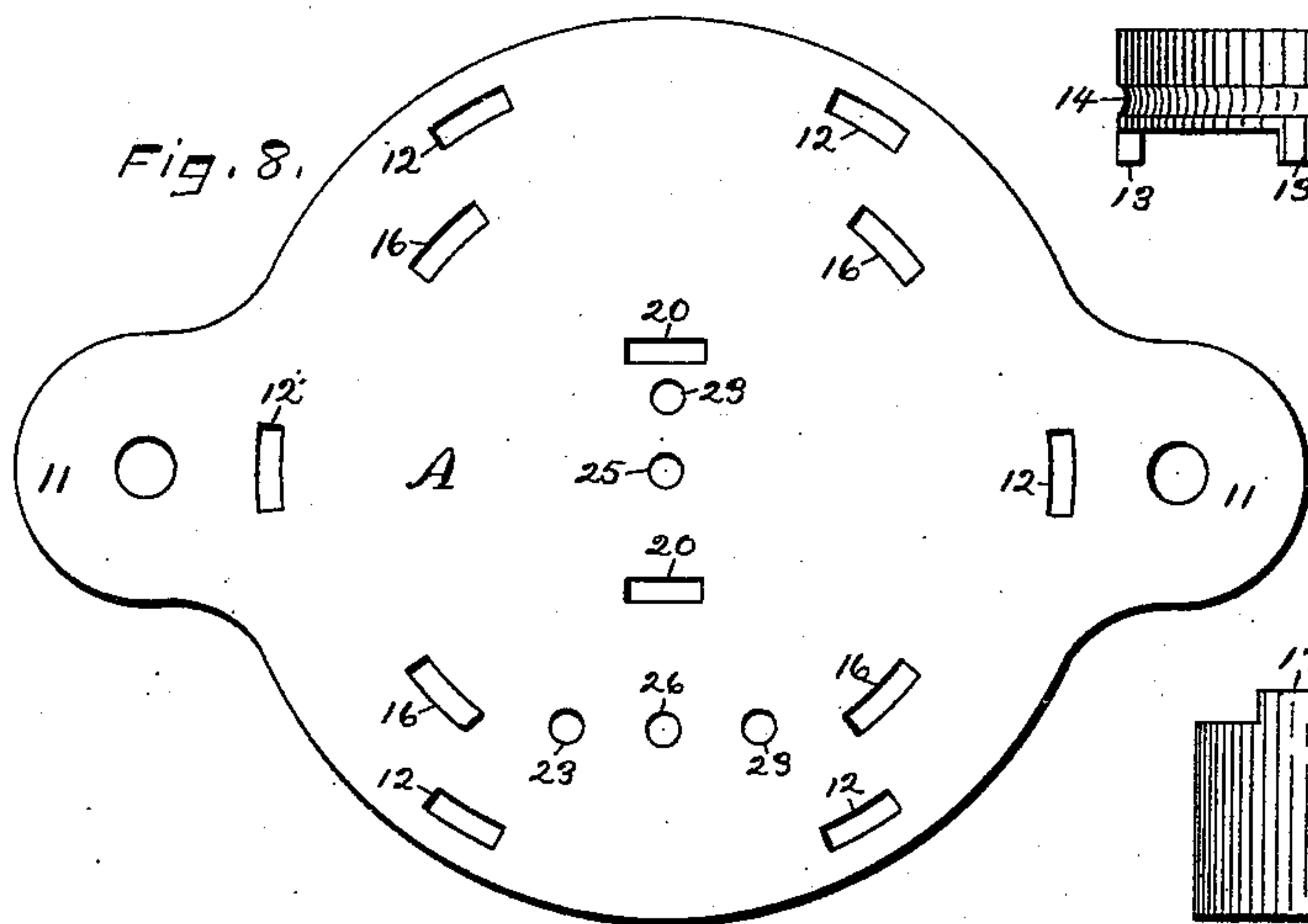
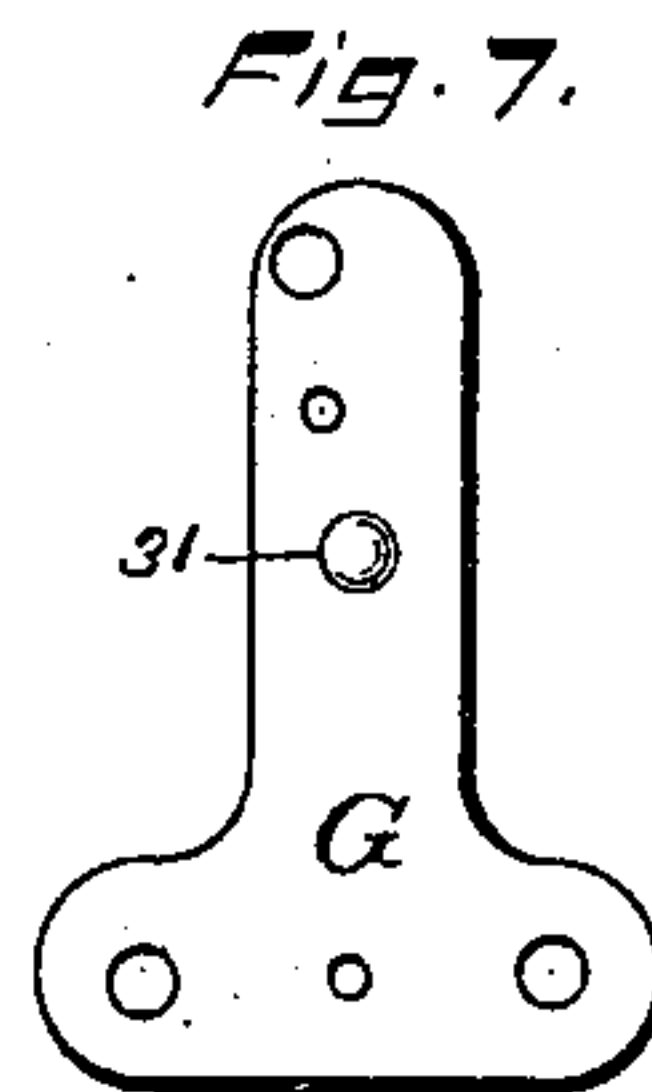
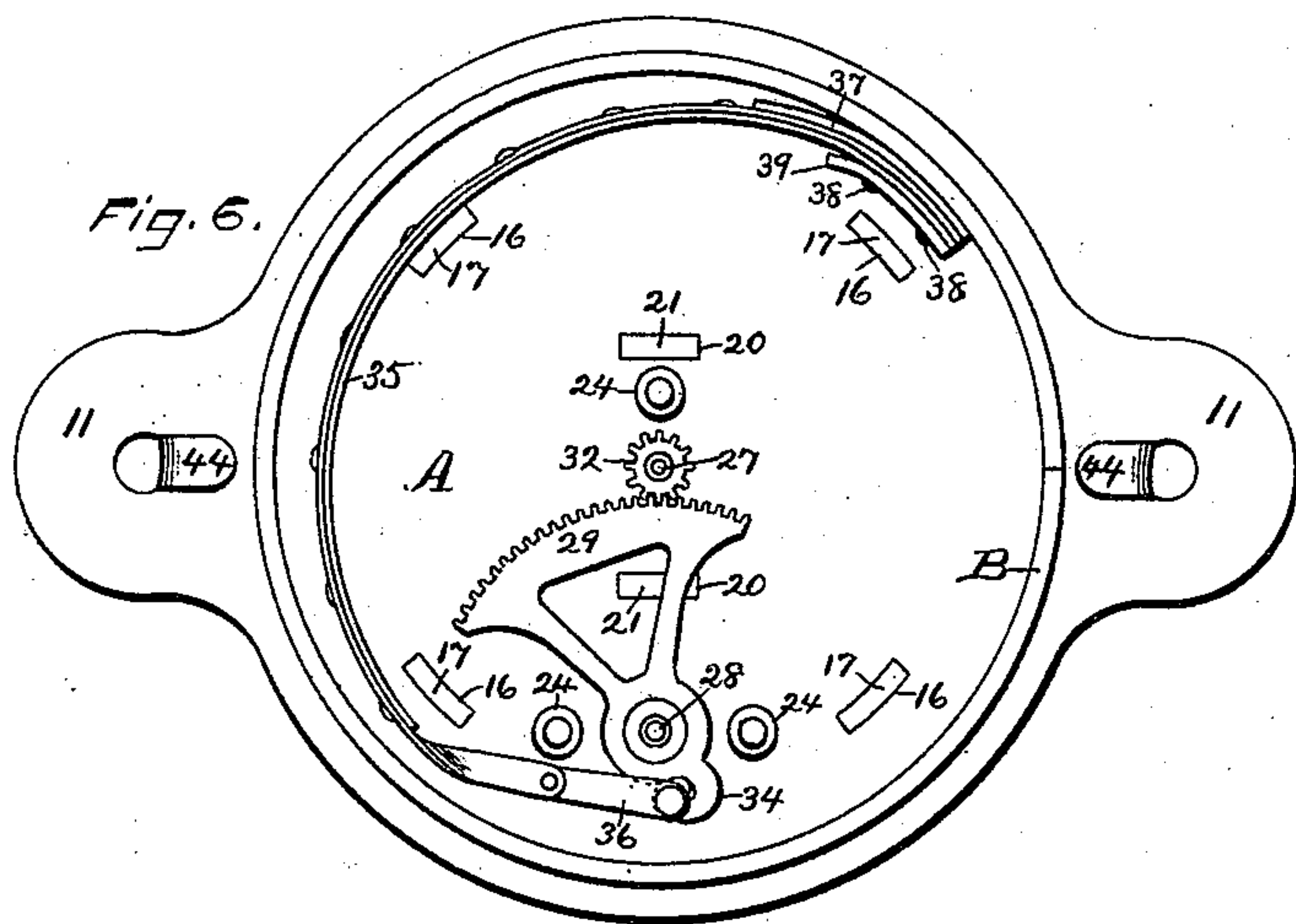
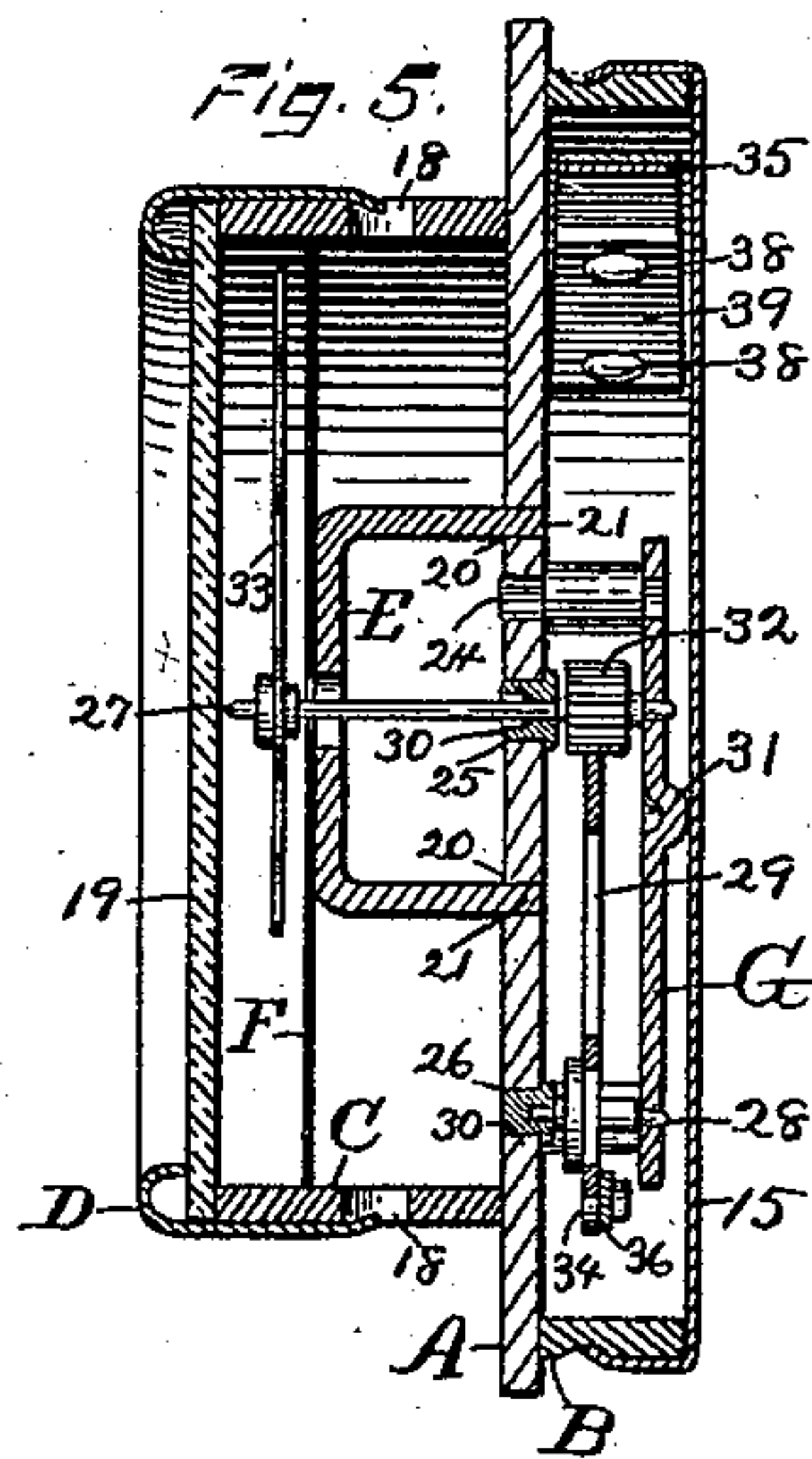
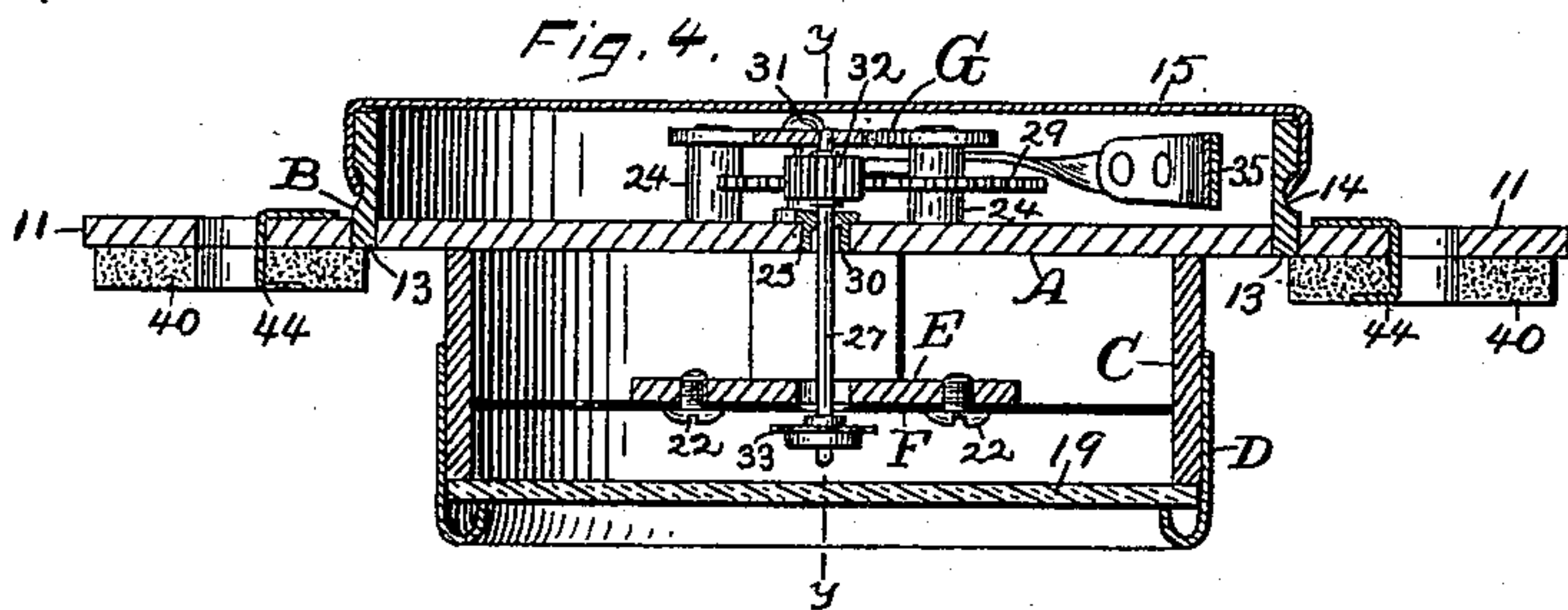
(No Model.)

2 Sheets—Sheet 2.

D. G. COOPER.
OVEN THERMOMETER.

No. 447,129.

Patented Feb. 24, 1891.



Witnesses,
John Edwards Jr.
J. D. Dunning

Inventor,
David G. Cooper.
By James Shepard Atty.

UNITED STATES PATENT OFFICE.

DAVID G. COOPER, OF PEQUABUCK, CONNECTICUT.

OVEN-THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 447,129, dated February 24, 1891.

Application filed January 21, 1890. Serial No. 337,581. (No model.)

To all whom it may concern:

Be it known that I, DAVID G. COOPER, a citizen of the United States, residing at Pequabuck, in the county of Litchfield and State of Connecticut, have invented certain new and useful Improvements in Oven-Thermometers, of which the following is a specification.

My invention relates to improvements in oven-thermometers; and the principal objects of my improvement are simplicity and economy of construction and general efficiency in use.

In the accompanying drawings, Figure 1 is a front elevation of my thermometer, together with a portion of an oven-door, to which it is applied. Fig. 2 is a plan or edge view of my thermometer with a horizontal section of the portion of the oven-door and the thermometer-hood on the line *xx* of Fig. 1. Fig. 3 is a front elevation of my thermometer with the bezel-ring and dial removed. Fig. 4 is a horizontal section of my thermometer on line *xx* of Fig. 1, the screws and index-shaft being shown in elevation. Fig. 5 is a vertical section of the same on line *yy* of Fig. 4, the index-shaft being shown in elevation. Fig. 6 is a rear elevation of the same with the cap and movement-plate removed. Fig. 7 is a detached view showing the broad side of the movement-plate. Fig. 8 is a detached view showing the broad side of the main plate. Fig. 9 is an edge view of the movement case or rim. Fig. 10 is a like view of the dial case or rim, and Fig. 11 is a detached view showing the broad side of the rack.

My thermometer is principally designed for use upon the ovens of kitchen stoves and ranges; but it is applicable for use upon any oven or hot-air chamber when it is desirable to indicate the temperature thereof.

In constructing my thermometer I form a principal or main plate A, the middle or body portion of which is substantially in circular form, with laterally-projecting side lugs 11 on diametrically-opposite sides, which lugs are perforated to receive bolts for fastening the complete device in place. Said main plate is also provided with a series of elongated openings 12, arranged in a circle near the outer edge of the plate, which openings are designed to receive the lugs 13, corre-

sponding in number and position on the movement case or rim B, the same being secured by riveting or heading said lugs. This case or rim B is grooved at its periphery, as shown at 14, and its back is covered by a thin metal cap 15, which fits upon said case or rim snugly, like a box-cover, the flange of the cap being of a width that will reach the groove 14 and its edge is turned into the groove slightly, as shown best in Figs. 2 and 4, to firmly secure said cap upon the case or rim B.

The main plate A is provided with a second series of perforations 16 on a smaller circle to receive correspondingly-arranged lugs 17 on the edge of the dial case or rim C, which in like manner is secured by riveting or heading said lugs. This dial-case is perforated at two or more points, as at 18, and receives upon its outside a bezel-ring D, which is turned over to form a bead at its front edge, so that when slipped or crowded upon the dial-case and over the dial-glass 19, Figs. 4 and 5, it holds said glass firmly between the bead and the front edge of the dial case or rim. The holes 18 are located at the rear edge of the bezel-ring when the bezel-ring is in place, and portions of the bezel-ring are slightly indented and pressed into said holes with any suitable punch or set, as shown in Figs. 2 and 5, to firmly hold the sash in place. The main plate A is also provided with a pair of elongated openings 20 to receive lugs 21 for securing the dial-bridge E in place, to which bridge the dial F is secured by means of suitable rivets or screws 22. The main plate is also provided with a series of round perforations in its middle portion, of which three, as at 23, are to receive the pillars or posts 24 of the movement-frame, and the other two 25 and 26 are to receive bushings 30, respectively, for the index-shaft 27 and the shaft 28 of the segmental rack 29. By the employment of said bushings I am enabled to make the main plate A also serve the function of one of the plates of the movement-frame. The other movement-plate G is secured to the opposite ends of the pillars or posts 24, as shown, and is provided with holes to constitute bearings for the respective shafts 27 and 28. On the movement-case B, I swage or strike up a little boss or projection 31, which is raised to a point substan-

tially in the same plane as the rear edge of the movement case or rim B, whereby a central support is formed for the cap 15, which prevents said cap from being pressed against the ends of the shafts of the movement. The shaft 27 is provided within the movement case or rim with a pinion 32, and in the dial-case in front of the dial with a pointer or index 33. The shaft 28 is provided with a segmental rack 29, the teeth of which engage the pinion 32, and is provided at the end opposite the teeth with an adjustable arm 34.

To the inner walls of the movement case or rim B, I secure a semicircular bimetal strip 35, the free end of which is connected by means of the link 36 to the arm 34 of the segmental rack. A bimetal strip, rack, and pinion in a thermometer of themselves are not new and are hereby disclaimed. In addition to these I provide the adjustable arm 34 on the segmental rack, which I first form, substantially as shown in Fig. 11, of a metal capable of being bent for the purpose of adjusting the thermometer by bending said arm. While I prefer to employ said adjustable arm as a matter of convenience, it is evident that other parts of my invention may be employed in connection with a rack having a non-adjustable point for the attachment of the link 36. Besides the adjustable arm, I add to this thermometer-movement there-enforcing piece 37, placing the same between the sides of the case and the end of the strip that is secured thereto, said re-enforcing piece extending along on the outer side of the bimetal strip for a short distance after it begins to separate from the side of the case, thereby strengthening the strip at its junction with the case, and yet leaving it with some elasticity at that point. During transportation or from any sudden jar the strip is more liable to be injured by bending at its junction with the case than at any other point, and by the employment of this re-enforcing piece extending a little beyond the point of attachment this liability to injury is prevented. I secure this strip to the rim of the case by means of two rivets 38, and I place a second re-enforcing piece 39 on the inner side of the strip and pass said rivets through the whole. This second re-enforcing piece, or "washer," as it may be termed, has the end that faces the body of the strip curved outwardly a little, as shown in Fig. 6, so as to allow free movement of the strip, and thereby do away with any angular bearing-point of the strip. I arrange the shaft 28 of the rack 29 centrally between two of the pillar-posts 23, thereby making said pillar-posts serve as stops to limit the movement of the rack and prevent it from ever being turned in either direction far enough to disengage its teeth from the pinion 32.

The dial may have any desired figuring or lettering upon it; but I have found in practice that some arbitrary figures—as, for instance, 1 to 12, as in a clock-dial—is more readily understood than figures indicating

the heat by degrees according to any standard scale, and therefore I use a dial with twelve figures and a circle divided into sixty degrees without any figure or figures to indicate the degrees Fahrenheit, as in the ordinary thermometer. I also prefer to place the words "Warm," "Low heat," "Baking heat," and "Very hot" at the proper points upon the dial, and to so adjust the thermometer that the pointer stands at twelve o'clock when there is no heat in the oven.

I have now described the thermometer proper, and will proceed to describe its attachment to the oven and some special provisions therefor. For its best working it should be insulated from the oven, and in order to provide such insulation and insure that it shall be properly placed I arrange upon each of the lugs 11 a washer 40, of asbestos or other insulating or non-conducting material, and I secure the same thereto by means of clips 44, which are preferably T-shaped, and are secured with the T-head upon one side, and the shank or middle portion extending through the hole in the washer and lug and then clenched upon the opposite side, as shown in Figs. 3, 4, and 6, so that the washers will surely be in the proper place when the thermometer is attached to the oven or stove door H. A hole is made in said door large enough to let the dial-case pass through it and project a greater or less distance upon the front of the door, and the thermometer secured by means of bolts 41, passing through the door, and the lugs 11, either with or without the addition of other washers, although it is preferred to place other washers thereon to bring the movement-case well into the oven, which additional washers, as at 42, may be of any suitable material, either non-conducting or otherwise.

Washers may be used in suitable thickness and number to make the front of the dial-case project only a short distance through the door; but if the room in the oven is wanted, or if for any reason it is desired not to have the thermometer project so far into the oven, a surrounding hood K may be placed on the front of the door, so as to surround and inclose the dial-case, as shown in Figs. 1 and 2, thereby protecting said case from the external air and at the same time giving an ornamental effect. This hood may be fastened on by the same bolts which secure the thermometer.

I claim as my invention—

1. In an oven-thermometer, the main plate A, having a series of perforations 12 and a series of perforations 16, with the movement case or rim B on one side and the dial case or rim C on the other, said cases having lugs received within said perforations for securing the cases to said plate, substantially as described, and for the purpose specified.

2. In an oven-thermometer, the combination of the main plate A, forming one of the movement-plates, the dial-case on one side

and the movement-case upon the other, with the posts or pillars 24, secured directly to said plate, and the plate G, secured to said posts, said plate A having perforations 25 and 26, with bushings 30 for bearings of the shafts of the movement, substantially as described, and for the purpose specified.

3. In an oven-thermometer, the combination of the movement-frame and its case or rim B, the plate G of said movement-frame, with the boss or projection 31 formed thereon, and the cap 15, held out of contact with the movement-shafts by said boss, substantially as described, and for the purpose specified.

4. In an oven-thermometer, the rack 29, provided with the curved adjustable arm 34, substantially as described, and for the purpose specified.

5. In an oven-thermometer the movements of which consist, essentially, of an actuating-strip, a segmental rack and its shaft, and an index shaft and pinion, the combination of the two lower pillar-posts 24, the shaft 28 for said rack, located between said pillar-posts 24 and the pinion 32, said two posts serving as stops for limiting the movement of the rack, substantially as described, and for the purpose specified.

6. In an oven-thermometer, the combination of the curved bimetal strip, the move-

ment case or rim B, and the intermediate re-enforcing piece 37, extending along by the side of the strip beyond its point of separation from said case, substantially as described, and for the purpose specified.

7. In an oven-thermometer, the combination of the movement case or frame B, the bimetal strip 35, and the inner re-enforcing plate between the rivet-heads and said strip and having the end which faces the body of the strip curved inwardly, substantially as described, and for the purpose specified.

8. In an oven-thermometer having fastening-lugs, the combination of said lugs with the non-conducting washers 40 and clips 44 for securing said non-conducting washers in place prior to attachment, substantially as described, and for the purpose specified.

9. The combination of an oven-thermometer having a circular dial-case for projecting through the door to which it is attached, and the surrounding ornamental and protecting hood K, adapted to be secured with the same bolts by which the thermometer is secured in place, substantially as described, and for the purpose specified.

DAVID G. COOPER.

Witnesses:

JAMES SHEPARD,
JOHN EDWARDS, Jr.