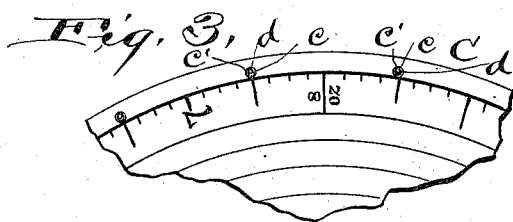
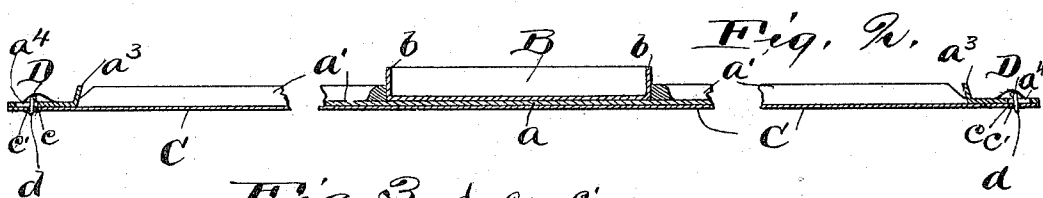
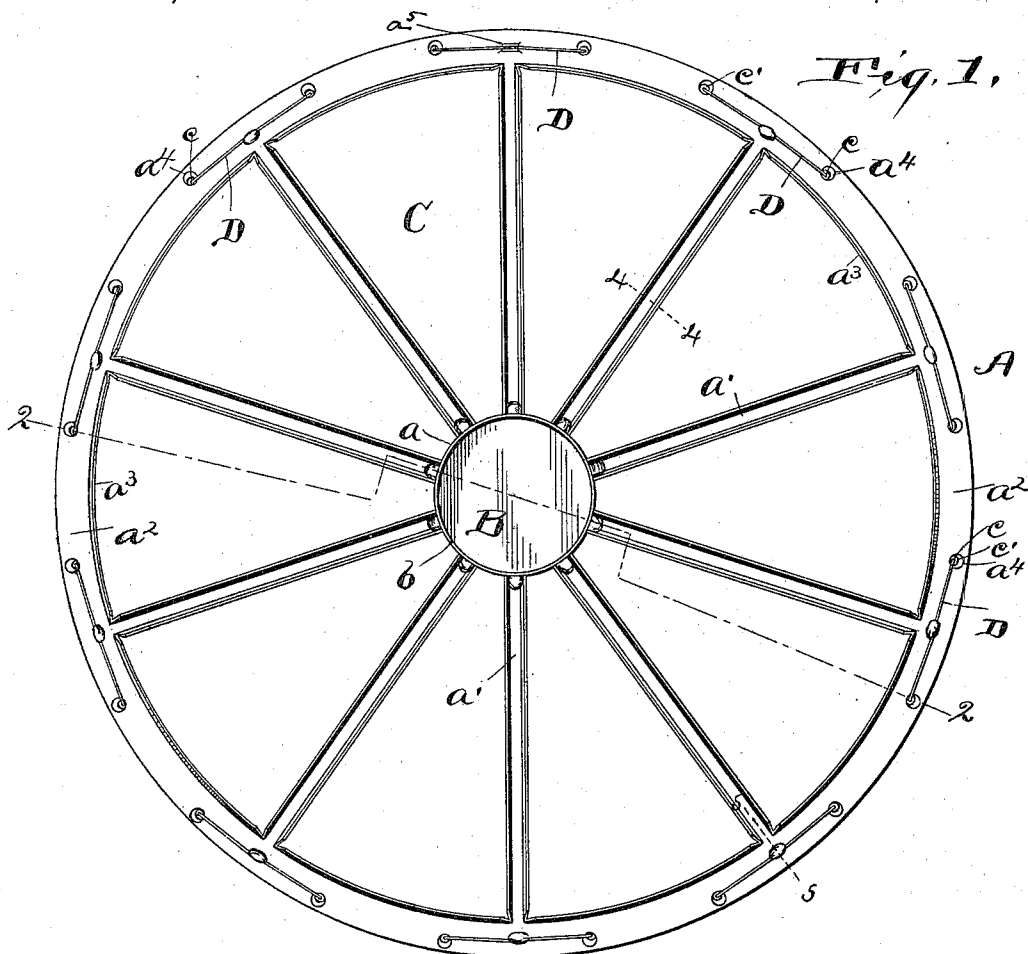


(No Model.)

J. H. SWIHART.  
DIAL.

No. 579,194.

Patented Mar. 23, 1897.



Witnesses:  
E. B. Gilchrist  
N. H. Rankin

*Fig. 4,*  
U a'

Inventor:  
John Henry Swihart  
By E. L. Thurston  
his atty.

# UNITED STATES PATENT OFFICE.

JOHN HENRY SWIHART, OF CLEVELAND, OHIO.

## DIAL.

SPECIFICATION forming part of Letters Patent No. 579,194, dated March 23, 1897.

Application filed October 30, 1896. Serial No. 610,535. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HENRY SWIHART, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Dials; 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 relates to improvements in dials, which consist of a stiffening-frame and a flexible dial proper or face whereon the graduations and notations are printed. The frame is generally made of metal which expands and contracts under the influence of heat and cold, and the flexible dial proper, which is usually made of paper, cloth, celluloid, or other analogous material, absorbs moisture and loses its stiffness, the result being that the dial proper does not always lie flat and smooth, but under different atmospheric conditions becomes at times more or less puckered and wrinkled.

The principal object of my invention is to provide a construction wherein the dial proper will be held flat and straight at all times.

The invention, which is hereinafter described, and pointed out definitely in the claims, is illustrated in the drawings, wherein—

Figure 1 is a rear view of my improved dial. Fig. 2 is a sectional view on line 2 2. Fig. 3 is a front view of a small part of the dial at and near the edge thereof, and Fig. 4 is a section through one of the spokes. Fig. 5 is a sectional view on line 5 5.

Referring to the parts by letters, A represents the dial-frame, which consists of the hub *a*, the longitudinally-curved spokes *a'*, the rim *a<sup>2</sup>*, and the rearwardly-projecting flange *a<sup>3</sup>* upon the inner edge of the rim, said frame being cut and stamped into the shape and form shown from a single piece of thin sheet metal. The frame may be additionally strengthened by a disk B, having an annular cylindrical flange *b*, which disk lies against the rear side of the hub, while the turned-up sides of the spokes abut against and are soldered to the flange *b*.

The flexible dial proper, C, may be made of

paper, celluloid, or any other suitable material. At intervals holes *c* are made in it near its edge, and eyelets *c'* are secured in these holes to prevent the surrounding material from being torn. Corresponding holes *a<sup>4</sup>* are made in the rim of the frame.

D represents springs which are secured to the rear side of the rim. They have outwardly-bent ends *d*, which extend loosely through the holes *a<sup>4</sup>* and into the eyelets *c*, with which they engage and exert a continuous force upon the edge of the dial away from the center. These springs, as shown, consist of small pieces of spring-wire having both ends *d d* bent outward and extended through the holes *a<sup>4</sup>* and into the eyelets. The middle part of the spring-wire, which is slightly bent outwardly from said holes, is then soldered to the rim *a<sup>2</sup>*. This form of spring is cheap, light, and effective, but any other form of spring might be substituted. These connections between the rim and springs are strengthened by the rearwardly-extended integral tongues *a<sup>5</sup>*, between which the middle part of the springs lie.

Having described my invention, I claim—

1. In a dial, the combination of a stiff frame and a flexible dial having a series of holes near its edge, with a series of springs engaging with the dial in said holes, and exerting their force to draw the edge of the dial away from the center, substantially as and for the purpose specified.

2. In a dial, the combination of a stiff frame having a series of holes, and a flexible dial having corresponding holes near its edge, with a series of springs secured to the frame extended through the holes therein and into the holes in the dial, and exerting their force to draw the edges of the dial away from the center, substantially as and for the purpose specified.

3. In a dial, the combination of a stiff frame having a series of holes, and a flexible dial having corresponding holes in which eyelets are secured, with a plurality of spring-wires having outwardly-turned ends which pass loosely through two holes in frame and into the said eyelets, the middle part of said wires being bent outwardly and soldered to said frame, substantially as and for the purpose specified.

4. In a dial, a frame consisting of the following integral parts, viz., a hub, a series of longitudinally-bent spokes, a rim, and a rearwardly-turned flange upon the inner edge of the rim, combined with a disk having a cylindrical flange, which disk is secured at the center of the frame with its flange in contact with the inner ends of the spokes substantially as and for the purpose specified.
- 10 5. In a dial, the combination of a stiff frame having a series of holes near its edge, and the rearwardly - extended integral tongues  $a^5$ , and a flexible dial having corresponding holes,

with spring-wires having outwardly-turned ends which pass loosely through the holes in the frame and engage in the holes in the dial, the middle part of said spring-wires being in engagement with said tongues, and soldered to the frame, substantially as and for the purpose specified.

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

JOHN HENRY SWIHART.

Witnesses:

E. L. THURSTON,  
E. B. GILCHRIST.