

No. 712,729.

Patented Nov. 4, 1902.

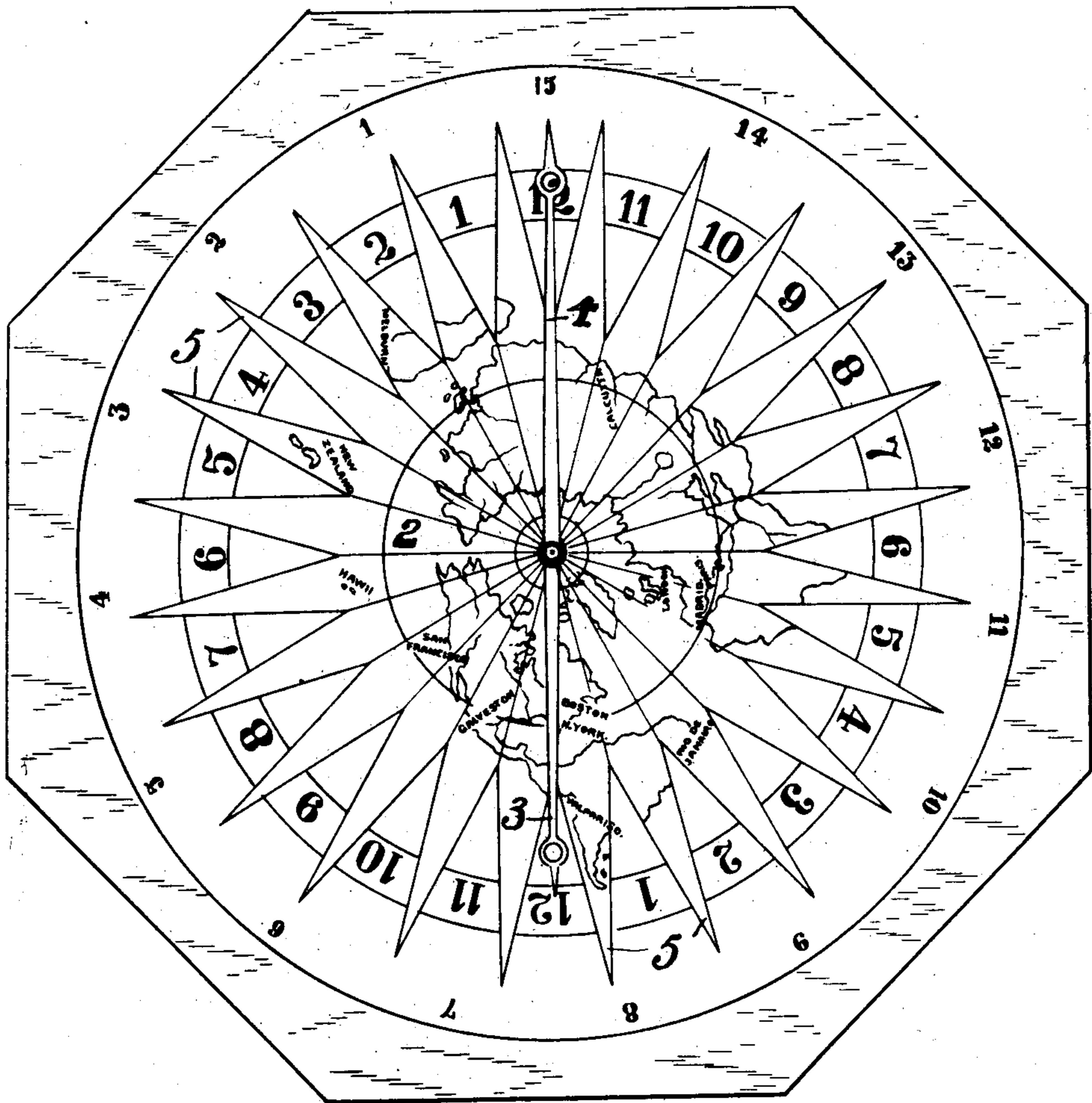
H. SCHUMACHER.
GEOGRAPHICAL CLOCK.

(Application filed Apr. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



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2 Sheets—Sheet 2.

Fig. 2.

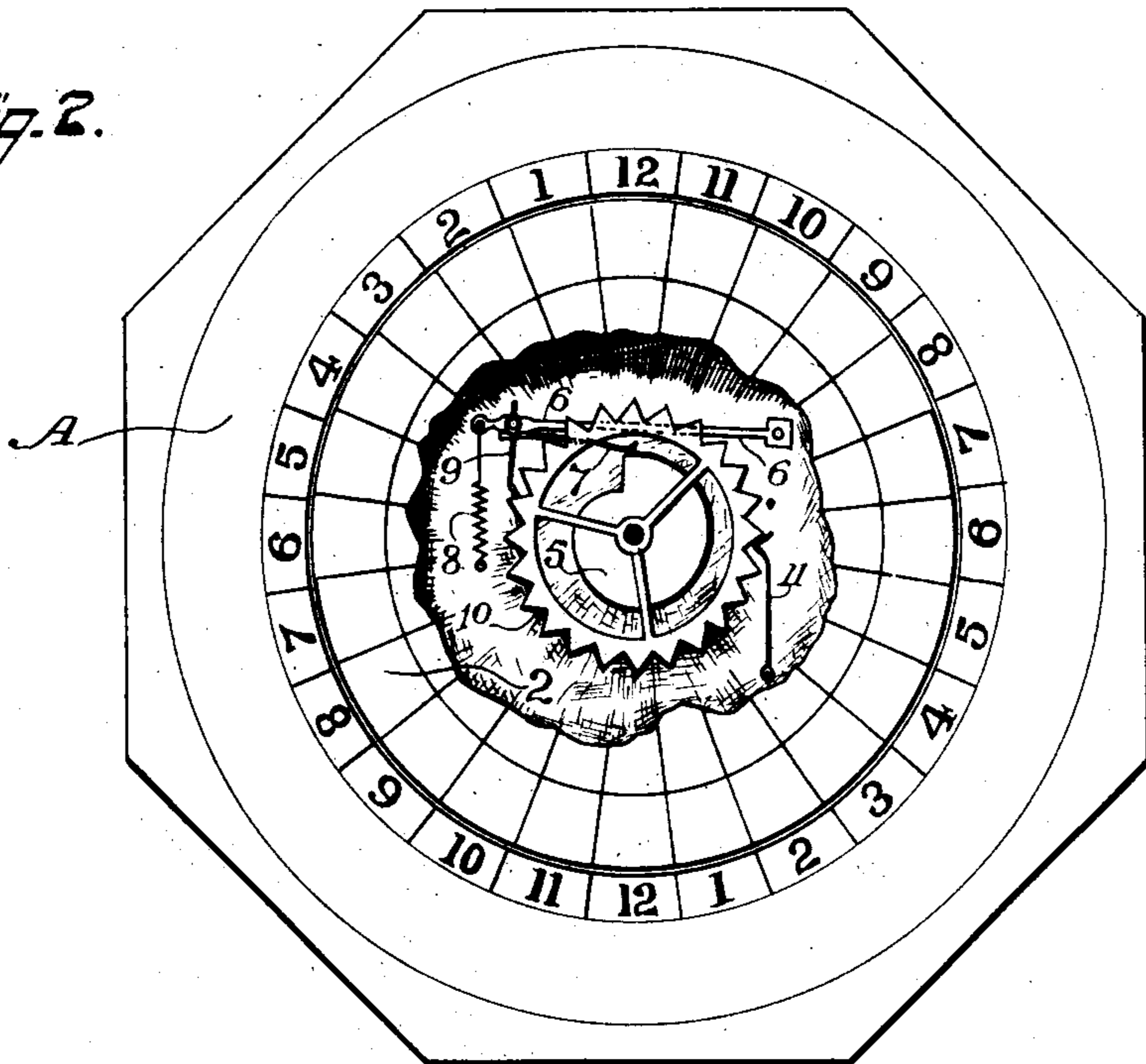


Fig. 3.

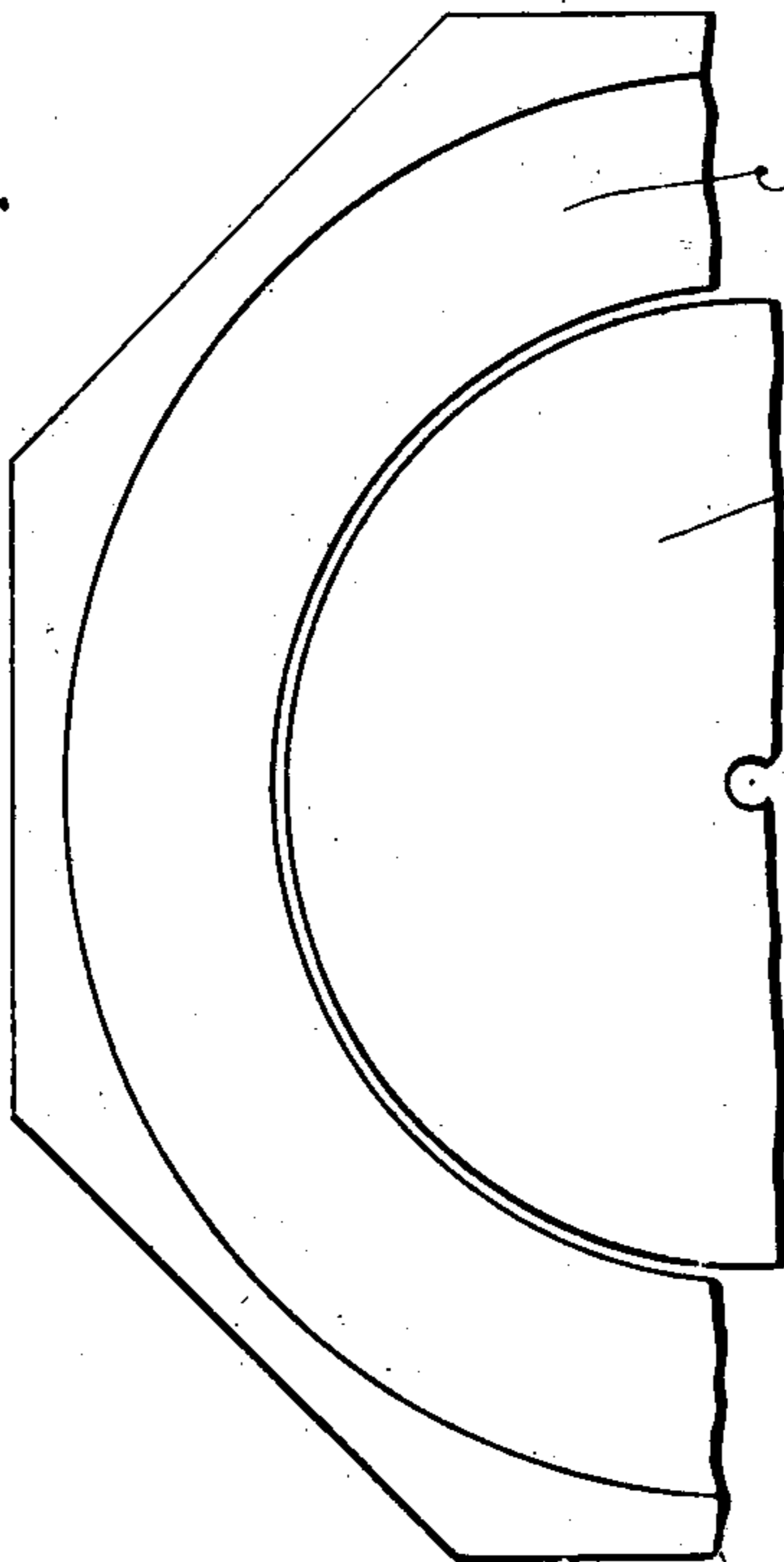
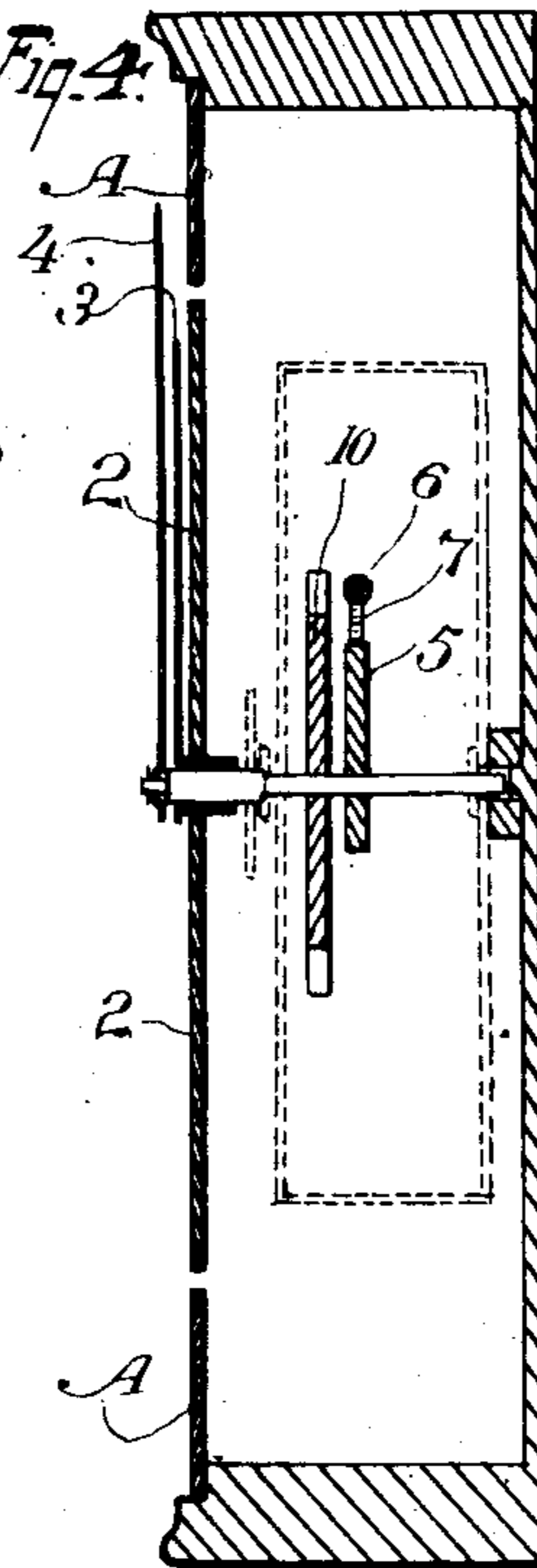


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY SCHUMACHER, OF SAN FRANCISCO, CALIFORNIA.

GEOGRAPHICAL CLOCK.

SPECIFICATION forming part of Letters Patent No. 712,729, dated November 4, 1902.

Application filed April 2, 1901. Serial No. 54,023. (No model.)

To all whom it may concern:

Be it known that I, HENRY SCHUMACHER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Timepieces; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device for instantly determining the time upon any meridian in the world and the relative time of different meridians.

It consists of the parts and the construction and arrangement of parts hereinafter described and claimed.

Figure 1 represents a polar map, showing the meridian-points for the southern hemisphere. Fig. 2 shows a portion broken away to illustrate the intermittent movement of the hour-hand. Fig. 3 is a section of movable disk and stationary outer part. Fig. 4 is a section of same, showing relative position of driving device and the hands.

I have here illustrated my invention as applied to an ordinary clock or timepiece. It will be manifest that the construction may be varied to suit requirements. As here shown, the dial A is subdivided into halves, each of which is divided to represent the twelve hours, which are the ordinary subdivisions of time, and one of said subdivisions is designed to represent the hours from six in the morning to six at night, while the other may indicate the hours from six at night to six in the morning. It will be understood, however, that if found more desirable the dial can be marked from one to twenty-four to cover the entire twenty-four hours. The central portion 2, interior to the dial, is here shown as forming what is known as a "polar" map, in which the north pole forms the center and the northern hemisphere is mapped about this center. Meridians radiate from this polar center to the periphery, and this central portion of the map is independent of the dial, but is fixed to turn with the hour-hand 3 upon its central post or sleeve.

If it is desired to keep the time of any particular locality, as Washington, the clock is set with the hour-hand coinciding with the meridian of Washington, and as the clock runs the hour-hand and the central map or

meridians will travel together, while the meridians of the map other than the one with which the hour-hand coincides will point to different hours on the dial, and thus show at once the time at either of the places through which the meridians pass.

In order to correctly indicate the times, I have arranged the figures on the dial to run from right to left around the dial instead of from left to right, in the usual manner, as this correctly represents the movement of the earth with relation to the sun while the clock is running. In order to operate this, the internal gearing of the clock would be arranged to cause the hour-hand and the meridian-map to turn to the left instead of to the right. This being a simple mechanical contrivance is not here illustrated.

If it is desired to cause the minute-hand to move to the right in order to correctly show the fractions of an hour, it can be done by interposing an idler-wheel, which will reverse the movement of the minute-hand and cause it to travel in the opposite direction from the movements of the hour-hand and meridian-map. The only object in such a change would be to enable the observer to note correctly that the time was five, ten, or fifteen minutes past the hour without the mental calculation if the minute-hand was running in the opposite direction to that usually given it, since in that case fifteen minutes after the hour would at first glance appear to be fifteen minutes before the hour.

In order to show the time in the southern hemisphere without duplicating the apparatus, I have arranged a series of meridian-lines upon projecting rays or spurs 5, which may extend from the central meridian-map outwardly, so as to coincide with the figures on the dial. Thus any meridians in the southern hemisphere—such as Melbourne, Calcutta, Cape Town, Rio Janeiro, and Valparaiso—may be indicated upon these projecting radial arms or rays, and the relation of the time of either of these meridians to the time to which the clock is set can be as readily determined as the meridians of places in the northern hemisphere.

It will be manifest that if the dial is subdivided to show twenty-four hours the rate of speed of the clock would have to be one-

half that which is usually given—that is to say, instead of making two circuits of the dial the hour-hand would only make one in the twenty-four hours. The same arrangement would be made if the dial shows two sets of figures running from “1” to “12.”

The hour-hand of the clock may move slowly and continuously; but I prefer to move it over the hour-spaces by intermittent movements, so that the hour-hand will stand at one division of time until the hour is completed and will then move to the next division by a single movement.

As here illustrated, the stem or post upon which the minute-hand 3 is mounted turns to the right and has a cam 5 fixed to turn with it. An arm 6, having a lug 7, is fulcrumed so that the lug rests upon the cam and may have any intervening antifrictional contact. As the minute-hand passes around the dial, the cam moves with it and the highest part of the cam lifts the lever, and when the cam has passed the lug 7 a spring 8 acts to pull the lever down with a sudden movement, which is allowed by the abrupt offset of the cam. The arm carries a pawl 9, which engages teeth of a ratchet-wheel 10, and this wheel is mounted and turnable with the hour-hand 3. The space between the ratchet-teeth and the lift of the arm and pawl equals the distance which the hour-hand is to move over the dial at each impulse. Therefore when the cam raises the pawl gradually during the movement of the minute-hand around the dial it will engage the following tooth of the ratchet-wheel, and when the cam releases the lever the spring 8 will move the arm, pawl, and ratchet and instantly advance the hour-hand one interval of the dial. 11 is a holding-pawl to prevent back movement of the ratchet.

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

1. The combination in a timepiece of a fixed

exterior dial having time subdivisions marked thereon, hour and minute hands movable over said dial, a central disk turnable in unison with said hour-hand, a polar map of one hemisphere upon said disk, and having substantially a triangular shape, radial projections upon the periphery of said disk, and segments of a polar map of the other hemisphere upon these projections.

2. The combination in a timepiece of a fixed dial with time subdivisions thereon, hands adapted to travel over said dial, a disk concentric with said dial and turnable in unison with one of said hands designated as the hour-hand, peripheral projections upon said dial which are movable over the time subdivisions of the fixed dial, said projections having substantially a triangular shape, a polar map of one hemisphere upon the disk, and a segment of a polar map of the other hemisphere upon each of said projections.

3. The combination in a timepiece of a fixed annular dial with time subdivisions marked thereon, a central disk independent thereof having a polar map and meridians of the northern hemisphere radiating from the center to the periphery, time-indicating hands turnable about the common center whereby the meridians other than that which coincides with the hour-hand will indicate correct time at those points, points or rays of substantially triangular shape projecting radially upon the periphery of said disk and coinciding with the meridians of places in the southern hemisphere whereby the relative time of all places in both hemispheres is simultaneously indicated.

In witness whereof I have hereunto set my hand.

HENRY SCHUMACHER.

Witnesses:

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S. H. NOURSE.