

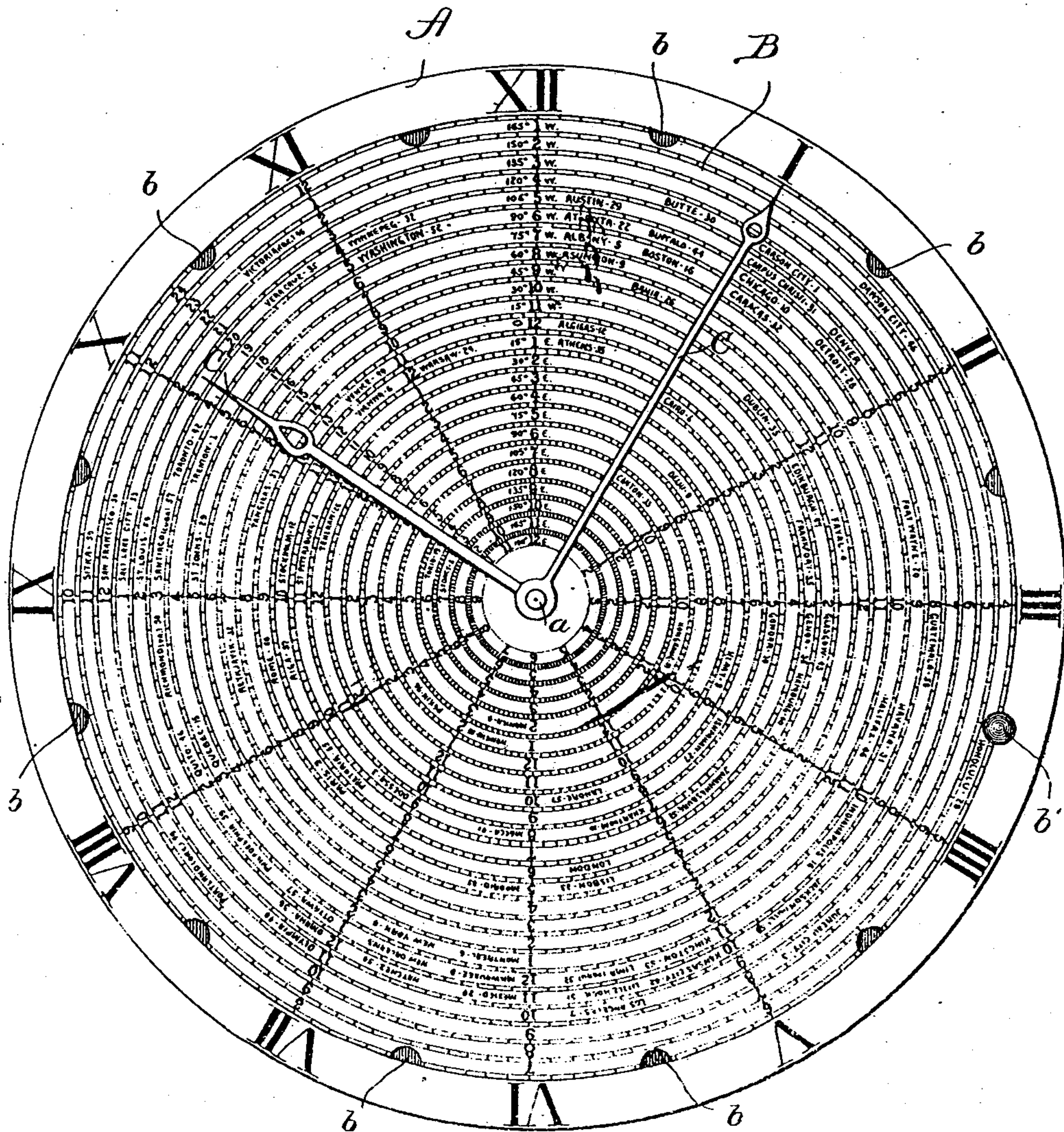
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Patented Sept. 11, 1900.

A. G. BEAUNISNE.
GEOGRAPHICAL CLOCK.

(Application filed Feb. 12, 1900.)

(No Model.)



Witnesses:
Geo. C. Davison
John Enders, Jr.

Inventor:
Albert G. Beaunisne,
By Dyumforth, Dyumforth & Lee,
Att'ys.

UNITED STATES PATENT OFFICE.

ALBERT G. BEAUNISNE, OF CHICAGO, ILLINOIS.

GEOGRAPHICAL CLOCK.

SPECIFICATION forming part of Letters Patent No. 657,686, dated September 11, 1900.

Application filed February 12, 1900. Serial No. 4,923. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. BEAUNISNE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Clocks, of which the following is a specification.

My invention relates particularly to clocks designed to show simultaneously the hours for different longitudes.

My object is to provide a clock of this class of extremely-simple construction and yet capable of showing at a glance the time for a large number of different longitudes.

I accomplish my purpose by employing a stationary composite dial made up of concentric rings of dial-numerals, the corresponding characters whereof are separated by angular distances corresponding to differences in longitude, and in connection with this dial hour and minute hands of sufficient length to indicate time on all of said rings of dial-numerals.

Preferably for the purpose of my invention the earth's surface (or such portion thereof as provision is made for) is divided arbitrarily into time divisions or zones after the manner of the standard-time divisions now employed in this and other countries.

In the accompanying drawing the invention is shown embodied in a convenient form. Preferably an outer permanently-fixed annular dial A is employed, and an adjustable inner composite dial B is fixed within the annulus afforded by the outer dial. At the common center are the hand-posts, the minute-hand post being indicated by *a*.

C C' represent the minute and the hour hand, respectively.

The dial B is divided, by preference, into twenty-four concentric rings or dial zones, designated by the numerals from "1" to "24," inclusive. Each zone thus represents a time-division or earth zone fifteen degrees in width, and the time changes one hour in passing from one zone into another. The inner boundary of the inner dial zone and the outer boundary of the outer dial zone represent the date-line, these boundaries being approximately one hundred and eighty degrees east or west of Greenwich. The mean solar time of the outer boundary of each earth zone has

been arbitrarily selected as the time for the zone, and it will thus be seen that the mean solar time for any point in an earth zone may be found by adding a correction to the earth-zone time. It follows that the outer boundary of the twelfth dial zone from the center corresponds to the meridian of Greenwich, and therefore, adopting Greenwich as the base-meridian, said twelfth dial zone may properly be marked as of "0" degrees. Progressing outwardly from the twelfth zone the zones may be marked in an increasing series of degrees west, and progressing inwardly in an increasing series of degrees east.

The prominent cities of each time zone are designated on their respective dial zones, and for convenience of reference the names are alphabetically arranged circumferentially of the zones, beginning always at a common angular division of the dial itself.

The dials may be numbered from "1" to "12" to indicate the hours of the half-day, or from "1" to "24" to indicate the hours of the whole day. They are here shown numbered from "1" to "12." The day is assumed to begin at one hundred and eighty degrees east. The number "12" of the inner zone-dial is at the top, and progressing outwardly this number is one space removed to the right in every new zone met. When the Greenwich zone is reached, the number "12" again appears at the top. The dial B is shown so set with relation to the dial A that the Greenwich zone-dial corresponds to the dial A, and the clock may be said to be set for Greenwich time.

To enable the dial B to be moved to cause any zone-dial to correspond with the outer and more prominent dial A, a series of half-circular perforations *b* are provided at the margin of the dial B, any one of which may be caused to register with a half-circular perforation in the dial A for receiving a pin *b'*, which locks the two parts together. Once the dial is set for a given locality it remains stationary.

The correction to be added to the indicated zone-time for any city in a given zone in order to secure mean solar time is set down close to the name of the city—for instance, after Washington occurs the number "52," indicating that fifty-two minutes is the cor-

rection to be added to the time for the Washington zone to give the mean time for Washington itself.

It is to be understood that the improved dial and appropriate hands may be (and ordinarily are) used in connection with the ordinary clock frame and mechanism. Where the composite dial is adjustable, any suitable adjusting means may be employed. In many (and probably the majority of) instances the dial will be less elaborate than here shown; but the principle of my invention which cannot be departed from without great disadvantage is that of having concentrically-arranged dials the corresponding figures of which are separated by angular distances corresponding to longitudinal differences. It is not essential that the composite dial be formed in one piece. The hands are shown pointing to five minutes past ten for the inner zone, five minutes past nine for the adjacent zone, &c. Assuming a. m. time in the inner zones, p. m. time of a prior day is present when the tenth zone from the center is reached. The dial is shown graduated to five seconds. This graduation, consisting of short radial lines, is shown arranged in narrow rings separating the time zones, and it is to be borne in mind that one of these separating-rings is to be regarded really as a wide line or space separating time zones.

By way of further illustration, if the time for Athens is desired the name will be sought in the proper sector under the alphabetical arrangement, the time for the Athens zone will be noted as five minutes past eleven; and the mean time for the city will be found by adding the correction "35" noted after the name, giving its local mean time as forty minutes past eleven. Similarly the mean time for Washington will be found to be fifty-seven minutes past four. It will be noted that the method of reckoning is to take the hour indicated by the hour-hand on the zone whose time is sought and the minutes on the zone which is the basis of comparison. The reason for this is that the zone times differ by whole hours only, since the zones are fifteen degrees in width.

What I claim as new, and desire to secure by Letters Patent, is—

1. A dial divided by concentric circles into dial zones, each dial zone bearing dial-numerals for indicating time for a corresponding earth zone and bearing names of places located on said earth zone, one marginal dial

zone representing an extreme eastern or western earth zone and the remaining dial zones being successively removed therefrom in a common direction and located according to the longitudes of the earth zones respectively represented, substantially as and for the purpose set forth.

2. A dial divided by concentric circles into dial zones, each dial zone bearing dial-numerals for indicating time for a corresponding earth zone and bearing names of places located on said earth zone, the concentrically-arranged dial-numerals being also disposed in radial alinements, any given numeral of any dial zone being in radial alinement with a different numeral of any adjacent dial zone, the names of places appearing on the several dial zones and having the same initial letter being in radial alinement, substantially as and for the purpose set forth.

3. The combination of a dial divided by concentric circles into dial zones, each dial zone representing an earth zone of fifteen degrees width and bearing dial-numerals for indicating time for said earth zone and bearing also names of places on said earth zone, the numerals of the dial zones being in radial alinements, any given numeral of any dial zone being in radial alinement with different numerals of adjacent dial zones, and hour and minute hands moving over the face of said dial, said hour-hand being disposed to indicate simultaneously the hours for the several zones while the minute-hand indicates the common minute for the several zones upon one given dial zone, substantially as and for the purpose set forth.

4. The combination with a permanently-fixed prominent ring of dial-numerals, of a normally-stationary adjustable dial divided by concentric circles into dial zones, said dial zones bearing dial-numerals and also names of places on the respective earth zones represented, said numerals being disposed in radial alinements, adjacent numerals of each alinement being dissimilar, the adjustability of the composite dial permitting any dial zone to be placed with its numerals in radial alinement with like numerals of said prominent dial, whereby a time-indicator for use in different longitudes is afforded, substantially as and for the purpose set forth.

ALBERT G. BEAUNISNE.

In presence of—

D. W. LEE,
A. D. BACCI.