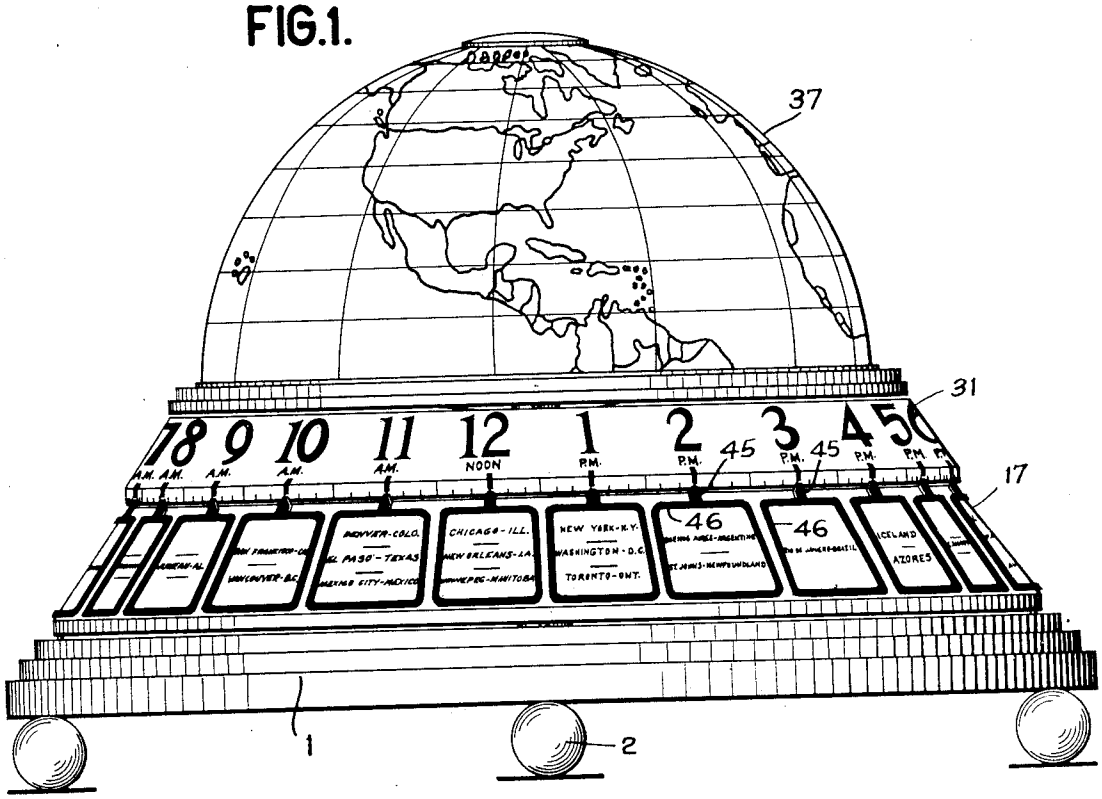
March 31, 1936. L. S. HARRISON 2,036,046

TIME INDICATING DEVICE

Filed Oct. 20, 1934 2 Sheets-Sheet 1

FIG.1.



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Filed Oct. 20, 1934 2 Sheets-Sheet 2

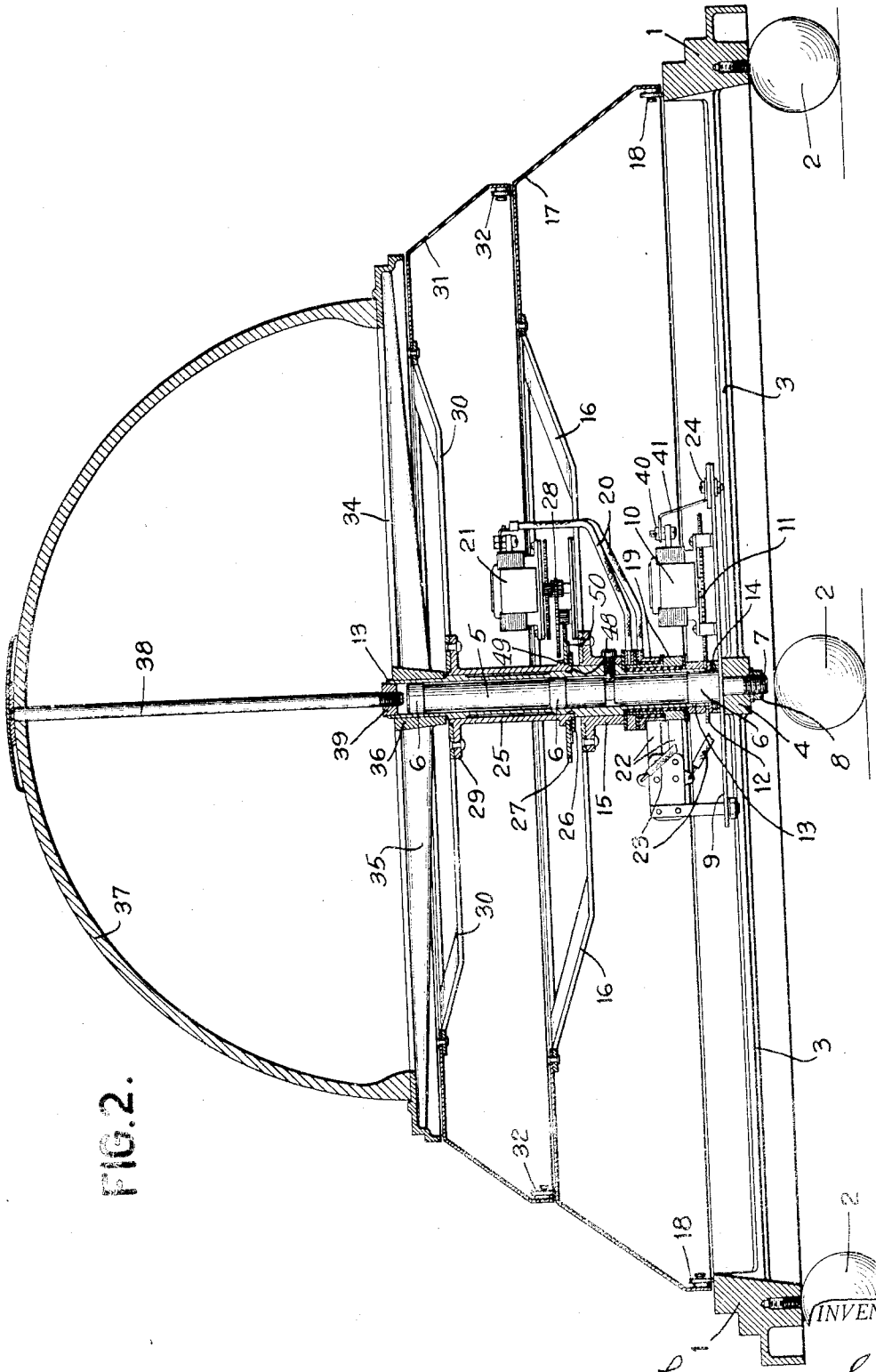

FIG. 2.

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TIME INDICATING DEVICE

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11 Claims. (Cl. 58—44)

This invention relates to clocks and more particularly to a world clock in which the time in different parts of the world is simultaneously indicated.

It is an object of this invention to provide a new and novel time indicating mechanism having a movable member carrying time indicating numerals adjacent to a plurality of stations with representations thereon designating different locations throughout the world.

It is another object of this invention to provide a mechanism for moving the member carrying time indicating numerals relative to the stations and for moving both relative to an observer whereby the stations may be observed in succession from a fixed position of the observer or at any angle by a plurality of observers.

Various other objects and advantages of my invention will be obvious from the following particular description of one form of mechanism embodying the invention or from an inspection of the accompanying drawings, and the invention also constitutes certain new and novel features of the construction and combination of parts hereinafter set forth and claimed.

In the drawings:

Fig. 1 shows a front elevation of the clock.

Fig. 2 shows a section taken on a line through a central axis.

In the preferred embodiment shown in the drawings, a circular base 1 is provided which is mounted on four spheres 2 fixed thereto. The base, which may be a casting of suitable metal or of wood is provided with a plurality of radial webs 3 terminating in the center at a boss 4, (Fig. 2). A vertical spindle 5 provided with three bearing surfaces 6 is fastened to the base 1 by means of a threaded portion 7 of smaller diameter projecting through an aperture in the boss 4 and held by means of a nut 8. A shoulder formed between the lower bearing surface 6 and the extension 7 serves to hold a plate 9 firmly clamped against the boss 4. Mounted on the plate 9 is a self-starting synchronous motor 10, which is connected by a suitable train of gears 11 to a gear 12, which is fixed to a sleeve 13. The sleeve 13 is pivotally mounted on the spindle 5 bearing against the bearing surfaces 6 of said spindle which are relieved in between, and resting at the base on a ball race 14 which in turn rests on the plate 9.

Fixed to the sleeve 13 is a flange 15 which supports a plurality of brackets 16 attached thereto. These brackets in turn are fixed to a member 17 which in the preferred form is a hollow, pressed metal, member of conoidal shape. These members are provided with a plurality of wheels 18 at the lower edge which rest on the base 1 and support it while rotating.

Also fixed to the sleeve 13 are collector rings 19 which are suitably insulated from the sleeve and from each other and which are connected by means of wires 20 to a motor 21 supported by one of the brackets 16.

Wiping on the collector rings 19 are two brushes 22 which are stationary and mounted on plate 9. These brushes are connected by wires 23 to suitable binding posts such as at 24 but in the drawings the wires have been cut away in order not to confuse the details of the drawings.

A sleeve 25 is rotatably mounted on the sleeve 13 and bears at its lower end on a shoulder 48 of the sleeve 13. A disk 26 is fixed to the sleeve 25. A gear 27 is rotatably mounted on the sleeve 25 and is held in frictional cooperation with the disk 26 by means of a shoulder 49 on the sleeve 25 and a friction spider 50 held between the disk and the gear 27. This is the usual construction and method used between the driving gear and the minute-hand of the clock to permit the minute-hand to be set. In the applicant's structure the member 31 may be turned manually against the friction spider 50 in event the motor 21 should stop and the clock require setting. Normally the member 31 is driven by the motor 21.

The motor 21 is connected to the gear 27 through the gear train 28 by means of a pinion mounted on the motor shaft and meshing with said gear train. The sleeve 25 is therefore rotated by said motor through the friction spider previously explained and consequently the member 31 is rotated. Integral with the sleeve 25 at its upper end is a flange 29 which supports a plurality of brackets 30 fixed thereto and said brackets in turn are fixed to the member 31 which is a hollow, sheet metal member of conoidal form similar to the member 17. The member 31 is also provided with a plurality of wheels 32 at its lower periphery which rest on the upper surface of the member 17 and support the member 31 during rotation.

A plate 34 having stiffening ribs 35 terminating in a boss 36 is fixed to the sleeve 13 and mounted on this plate is a representation of the Northern Hemisphere of the world indicated by the reference numeral 37. This member 37 is securely fastened to the plate by means of a rod 38 which is screwed into a plug 39 which in turn is fixed to the end of the sleeve 13.

Although only one terminal 24 is shown it is to

be understood that two such terminals are provided, they being located in the same plane and one behind the other. As shown in Fig. 2, there would be only one such terminal appear to view in the drawings. This is likewise true of terminals 40 and wires 41. A suitable source of alternating current supply may be attached to terminal 24 and thus operate the synchronous motor 10. The gear train 11 between the motor 10 and sleeve 13 is such that it will cause the sleeve 13 to revolve twice a minute relative to the fixed base 1. The synchronous motor 21 being mounted on the sleeve 13 will also rotate in an orbit about the spindle 5 and the member 17 likewise rotates about the spindle at the rate of two revolutions per minute. Inasmuch as the wires 23 are also connected to terminals 24 and thence to the power supply, current will be transmitted through said wires, to brushes 22, thence to the collector ring 19, through wires 20, to the terminals of the synchronous motor 21. The gear train 28 connecting this motor to the sleeve 25 is such as to rotate the sleeve 25 at the rate of one revolution per twenty-four hours relative to the sleeve 13. As the member 31 is connected to the sleeve 25 this member will rotate one revolution per twenty-four hours relative to the member 17.

The member 31 is provided on the outside surface of its periphery with indicia and markings representing the hours of the day running from 12 midnight to 12 noon and from 12 noon to 12 midnight, with graduations between the hours indicating 10 minute intervals. Adjacent thereto and on the outside periphery of the member 17 are a plurality of pointers 45 registering with the time indicia on the member 31. The pointers are each connected integrally with a frame-like band 46 and within each frame is indicia representing various cities of the world. The cities indicated within the frame members are located relative to the meridians of the earth's surface so that the meridians being adjacent to the pointers 45 substantially pass through the cities listed within the frame 46 corresponding to that pointer. As will be seen from the previous description the hemisphere 37 and the member 17 are fixed relative to each other and should they remain stationary the member 31 only would rotate at the rate of one revolution per twenty-four hours. The pointers 45 register with the indicia on the member 31 to show the time of day or night it is at the places corresponding to that particular pointer as designated within its corresponding frame 46. Thus, as viewed in Fig. 1 the time shown is 12 noon at Chicago, Ill., New Orleans, La., Winnipeg, Manitoba; and 1:00 P. M. at New York, N. Y., Washington, D. C., Toronto, Ontario, etc. The members 17 and 37 revolve slowly together as previously described for the purpose of making it more convenient for the observer, thus making it unnecessary for him to walk around the clock to observe the different times at the various locations.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is as follows:

1. In a clock, a base, a vertical supporting element mounted on said base, a plurality of circumferential members adapted to be rotated about said vertical supporting element, time controlled means for effecting relative movement between the members about the supporting element as an axis and additional means for rotating the members in unison about said element without affecting the rate of said relative movement.

2. A clock comprising a member carrying time indicating numerals, a location indicating member cooperating with said numerals to indicate the time of day at the location, means for moving said numeral carrying member relative to said location indicating member, and means for moving the numeral carrying member and location indicating member together without interfering with the relative movement between said two members.

3. A clock comprising a member carrying time indicating numerals, a location indicating member cooperating with said numerals to indicate the time of day at the location, means for moving said numeral carrying member relative to said location indicating member, and means for moving the numeral carrying member and location indicating member together without interfering with the relative movement between said two members whereby all points of the location indicating member are brought into the vision of an observer at a fixed point.

4. A clock comprising a member carrying time indicating numerals, a location indicating member cooperating with said numerals to indicate the time of day at the location, means for moving said numeral carrying member relative to said location indicating member, and means for moving said numeral carrying member and location indicating member together without interfering with the relative movement between said two members, thereby presenting a fixed location on the location member to visibility from all angles.

5. A clock comprising a member carrying time indicating numerals, a location indicating member cooperating with said numerals to indicate the time of day at the location, means for moving said numeral carrying member relative to said location indicating member, and means for moving said numeral carrying member and location indicating member together without interfering with the relative movement between said two members, thereby presenting all points on the location member for observation with respect to the member carrying the time indicating numerals for observation from a plurality of positions.

6. A clock comprising a map, a time indicating member for indicating the time at various points on the map, time controlled means for moving the time indicating member relative to the map, and means for moving the time indicating member and map in unison without affecting said relative movement for presenting different locations on the map for observation from a predetermined point.

7. A clock comprising a map, a time indicating member for indicating time at various points on the map, time controlled means for moving the indicating member relative to the map, and means for moving the time indicating member and the map in unison without affecting said rel-

ative movement, for presenting different locations on the map for observation from a predetermined point, to present the readings resulting from the relative positions for observation from any point of the compass.

8. A clock comprising a geographical map, a location indicating member bearing names of locations on the map, a member carrying time indicating numerals cooperating with said map and said location indicating member to indicate the different times at the different geographical locations represented on the map and the location indicating member, and time controlled means for causing relative movement between the numeral carrying member and said map and between said numeral carrying member and said location indicating member.

9. A clock comprising a geographical map, a location indicating member bearing names of locations on said map, a member carrying time indicating numerals cooperating with said map and said location indicating member to indicate the time at the different geographical locations represented on said map and said location indicating member, time controlled means for causing relative movement between the numeral carrying member and the map and between the numeral carrying member and the location indicating member, and additional means for turning said map, location indicating member and numeral carrying member as a unit about a vertical axis without affecting said relative movement.

10. A clock, a base, a member representing the earth's hemisphere supported on said base for rotation, a member carrying time indicating numerals adjacent said first mentioned member and cooperating therewith to indicate the time at different points throughout the world, time controlled means for causing relative movement between said numeral carrying member and said first mentioned member, and additional means for causing movement of said numeral carrying member and said first mentioned member as a unit relative to said base.

11. A clock, a base, a member representing the earth's hemisphere supported on said base for rotation, a member carrying time indicating numerals adjacent said first named member and cooperating therewith to indicate the time at different points throughout the world, time controlled means for causing relative movement between said numeral carrying member and said first named member and additional means for rotating said numeral carrying member and said first mentioned member in unison without affecting relative movement.

LAURENCE S. HARRISON.