(No Model.)

H. L. PHILLIPS.

CLOCK.

No. 329,078. Patented Oct. 27, 1885.

Fig. 2.

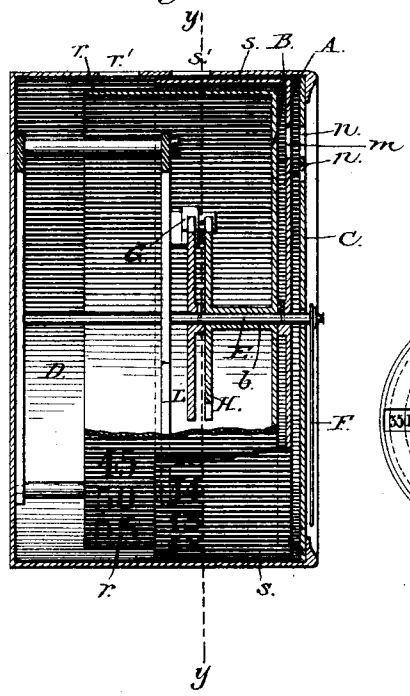


Fig. 3.

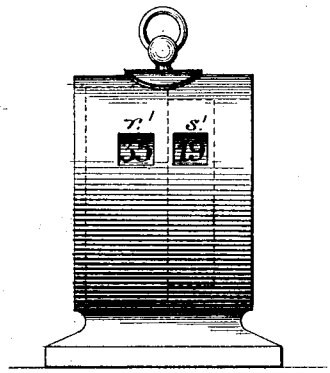


Fig. 4.

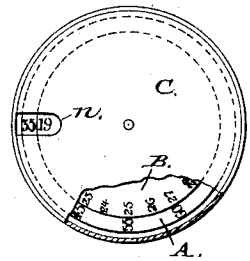


Fig. 5.

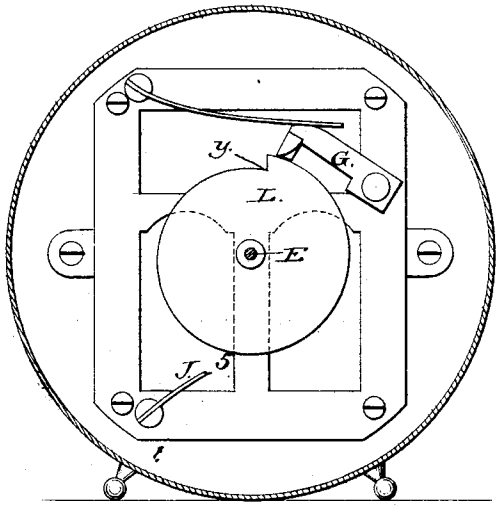
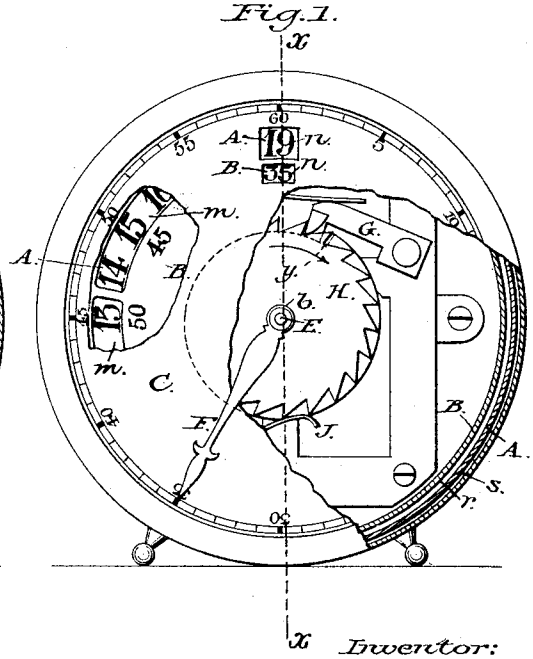


Fig. 1.



Attest:
John A. Ellis
A. B. Mowry

Inventor:
Henry L. Phillips
By David A. Burr
Atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HENRY L. PHILLIPS, OF NEW YORK, N. Y.

CLOCK.

SPECIFICATION forming part of Letters Patent No. 329,078, dated October 27, 1885.

Application filed February 19, 1885. Serial No. 156,346. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. PHILLIPS, of the city, county, and State of New York, have invented a new and useful Improvement in Clocks; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates more especially to that class of clocks in which a moving dial is employed, and has for its object a convenient construction and arrangement of the dials, whereby the hour and minutes marked upon the dials may be read off upon the periphery of the case as well as upon the face of the clock through openings therein.

It consists in the combination, in a clock, with each other and with a face-plate perforated to permit portions of both to be seen through it, of two superimposed dials mounted parallel with the face, the one carried by the main arbor or spindle of the clock to indicate minutes, and the other actuated intermittently by the movement of said spindle, once at each revolution thereof, to indicate the hours, (12 or 24,) and of concentric flanges projecting inwardly, one from the edge of each dial, and whose peripheries are divided and marked to indicate, respectively, the hours and minutes through openings in the periphery of the clock-case.

In the accompanying drawings, Figure 1 is a front elevation of a clock fitted with my improved revolving dials, portions of the face and dials beneath being broken away; Fig. 2, a diametric section in line *x x* of Fig. 1, the movements of the clock not being shown; Fig. 3, a side elevation of a similar clock, on a reduced scale, showing the openings for the time at one side; and Fig. 4, an elevation of the face of the clock with the dials constructed and arranged in simplest form without an auxiliary minute-hand; Fig. 5, a transverse section in line *y y* of Fig. 2, illustrating the mechanism for imparting an intermittent movement to the hour-dial.

A represents the minute-dial, and B the hour-dial, of a clock, which is designed to indicate the hours, consecutively, from one to twenty-four. The minute-dial is mounted upon the main arbor or spindle E of the clock-movement, to rotate once in an hour, parallel with the clock-face and immediately back of it. The hour-dial B is mounted upon a tubular spindle, *b*, encircling the spindle E, to turn loosely thereon, and revolves parallel with the minute-dial A back of it and in close proximity thereto. Its face is divided into twenty-four points, which are marked, respectively, with the figures or numerals from 1 to 24. The hour-dial is made to move intermittently one twenty-fourth part of a revolution at each complete revolution of the minute-dial by means of a weighted or spring-actuated pawl, G, pivoted to the frame of the clock to drop upon a ratchet-wheel, H, (see Fig. 1,) of twenty-four teeth made fast to the inner end of the tubular spindle *b*.

A spring, J, is made to rest upon and bear successively against the extreme end or points of each of its teeth with a pressure which, being exerted upon the end only of the inclined tooth, has a tendency to carry it forward and to produce thereby a slight rotation of the wheel toward the pawl when the pawl is lifted clear of the teeth.

A cam-wheel, L, whose extreme diameter is slightly greater than that of the ratchet-wheel H, is secured upon the spindle E of the minute-dial to rotate with it in close proximity to the ratchet-wheel, so that the pawl G may rest upon its periphery. The periphery of the cam is cut to change abruptly at *y* from its extreme to its least diameter, so that the pawl, which is gradually lifted as it rides upon the cam out of engagement with the ratchet-wheel, (see Fig. 5,) suddenly drops thereon when it reaches the point *y*. The disengagement of the pawl from the ratchet occurs somewhat before it is allowed to drop, and in this interval the action of the spring J throws the ratchet forward far enough so that when the pawl drops it will strike the outer edge of the next tooth, (see Fig. 1,) and, bearing upon its inclined surface, will thereby cause the ratchet-wheel to revolve a distance measured by the length of the tooth, or until the pawl G reaches the extreme inner end of the notch between the teeth.

A series of segmental openings, *m m*, (see

Fig. 1,) are cut out of the face of the minute-dial A, to form a circle immediately over the series of numerals indicating the hours upon the underlying hour-dial B, so that the latter may be seen through the face of the minute-dial, and apertures *n n* are formed in the face-plate C of the clock, through which the ordinals indicating the hours on the dial B and the minutes on the dial A may be clearly seen, as shown in Fig. 1.

The spindle E may be fitted with a minute-hand, F, which, by the rotation of the spindle actuated by the clock-work, is carried continuously over the face of the clock, to indicate in the customary manner the minutes upon a scale on the margin of the face. I contemplate omitting this minute-hand in the simpler forms of clocks.

The rim of each dial is formed with an inwardly-projecting flange, the flange *r* of the hour-dial B being made so much wider than the flange *s* of the minute-dial as that the periphery of the former may be seen beyond the latter in a side view thereof, and the figures on the peripheries of both dials may be seen side by side through two apertures, *r' s'*, cut in the side or the top of the outer case, C, of the clock, as shown in Figs. 2 and 3.

The dials A and B may be constructed simply as thin plates or disks, revolving in manner as described, the one over the other, under a clock-face having suitable index-openings, *n*, therein, (see Fig. 4,) in which case the necessity of cutting the segmental openings through the outer minute-dial to disclose the numbers on the underlying hour-dial is avoided, the minute-dial being made of so much smaller diameter than the hour-dial as that the rim of the latter, bearing the hour-figures, may project and disclose said figures beyond it, (see Fig. 4,) or with the same arrangement of dials the figures may appear at the top of the clock with the hour above the minutes, or at the bottom of the clock with the minutes above the hour.

The movements of the clock within the inner case, D, (see Fig. 2,) are not shown in the drawings, and, being constructed in the customary manner well known to the art, do not need herein to be particularly described or illustrated.

The hour-dial may be subdivided into twelve parts and rotate once in twelve hours, with twelve intermittent movements, to indicate the ordinary division of time, instead of the twenty-four-hour system above described.

I claim as my invention—

The combination, in a clock having a perforated case, with two revolving disks or dials actuated by its movements, the one to make an intermittent movement at each complete revolution of the other, of concentric flanges projecting, respectively, from the rim of each disk, the outer flange being wider than the inner, so that each shall be separately visible through an opening in the case to disclose the figures marked on its periphery, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY L. PHILLIPS.

Witnesses:

P. ELBERT NOSTRAND,

A. B MOORE.