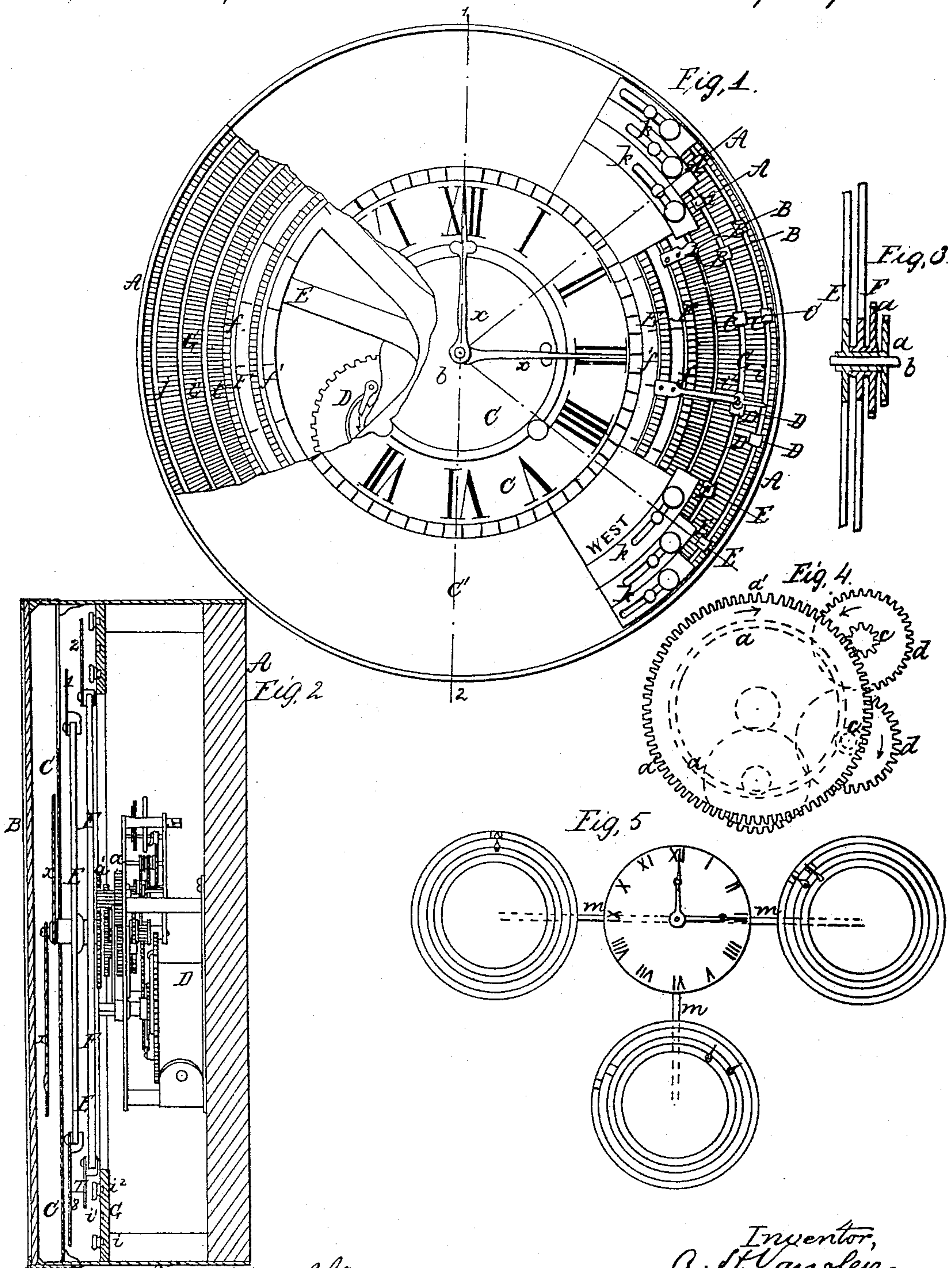


A. H. Vandervee

Time Check.

No. 89,524.

Patented Apr. 27, 1869.



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Letters Patent No. 89,524, dated April 27, 1869.

IMPROVEMENT IN RAILROAD REVOLVING TIME-TABLE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, AARON H. VANCLEVE, of South Amboy, county of Middlesex, State of New Jersey, have invented a Revolving Time-Table; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists of an instrument, fully described hereafter, in which a clock or other time-keeper is combined with one or more revolving pointers, representing a train or trains running in one direction, and one or more pointers representing a train or trains running in the contrary direction, and arranged in accordance with the graduations of the clock-dial and with the running-time of the trains, all substantially as described hereafter, the main object of the instrument being to enable the responsible attendant at the central station to ascertain at a glance the proper position of the different trains, as regards the different stations, and to guide this attendant in telegraphing to the different stations authority for the starting of the different trains therefrom, the instrument thus forming an accurate time-table, which can be referred to by the attendant, and telegraphed with much more promptitude than the elaborate time-tables in common use.

My invention will also be equally applicable at every station on the road where a telegraph-operator is employed, and may be placed at a conspicuous point, so as to exhibit to passengers in waiting where the expected train should be, if on time.

The instrument, when reduced to a small scale and attached to a watch, will also be of great use to engineers and conductors of trains, enabling them to properly regulate their own time, and indicating where and when they should pass other trains.

Another important use of my invention is to facilitate the framing, in the manner described hereafter, of the time-tables with which engineers and other officers of the road are furnished.

My invention also consists of certain pointers, indicating the different trains, and rendered adjustable on revolving plates or rings, graduated in accordance with the dial of the clock.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a face view of my revolving time-table;

Figure 2, a sectional view of the same, on the line 1-2, fig. 1;

Figures 3 and 4, detached views of part of the instrument; and

Figure 5, a modification of my invention.

Similar letters refer to similar parts throughout the several views.

On well-regulated railroads it is customary, on the arrival of a train at any station, to telegraph the fact to the central office, a competent attendant then com-

paring the time of arrival with the time set down on the tables with which he is provided, and retelegraphing to the station at which the train has arrived authority for it to leave.

This system is also pursued with trains about to start from either terminus of the road, it being in every case the duty of the responsible attendant at the central office, who is guided by his tables, to authorize the departure of the train by telegraph.

This plan, which places in the hands of one competent officer the control of the starting and stopping of all the trains, the regulation of their rate of speed from station to station, and, in fact, the entire management of their time by fixed tables, is exceedingly valuable, as it reduces the working of the railroad to a system, and almost entirely prevents the danger of collisions and other accidents which result from a careless running of trains.

It will be evident, however, that on an extensive railroad, where there is a great number of trains daily running in opposite directions, and at different rates of speed, the duties of this official will be very laborious, he having to refer constantly to large and complicated time-tables, which require considerable study, and which cannot possibly be so arranged as to indicate at a glance the position of any running train.

My improved indicator, or time-table, the construction and operation of which I will now proceed to describe, has been designed to overcome these objections, by indicating the position and direction of each running train at any time during its passage from one terminus to another, as well as its rate of speed and the points at which the different trains pass each other.

The instrument may also be used as a valuable medium for facilitating the arrangement of time-tables for the engineers and other officers of the road.

On reference to the drawing—

A represents a case, having a glazed door, B, through which a dial-plate, C, may be observed, and within this case, and secured to the back of the same, is an ordinary system of clock-work D, by which the hands *x x* are operated in the usual manner.

A disk, or ring E, having a cog-wheel *a*, is arranged to turn upon the clock-spindle *b*, and a similar disk, or ring F, provided with a cog-wheel *a'*, is arranged to turn upon the tubular spindle which connects the ring E and its cog-wheel together. (See fig. 3.)

Motion is communicated to these rings, or disks by means of pinions *c c*, (fig. 4,) which gear into the cog-wheels *a a'*, and which are themselves turned by wheels *d d*, geared together, and driven by the works of the clock.

The rings are thus turned in opposite directions, but at the same rate of speed, each disk being, in the present instance, arranged to make a complete revolution in twenty-four hours.

It should be understood here that although I have

described specific mechanism for imparting motion to the rings from the clock, different systems of gearing may be employed for the purpose, without departing from the main features of my invention.

A portion of the ring F, which is somewhat larger in diameter than the ring E, can be seen beyond the edge of the latter, and each ring is graduated to conform to the divisions of time on the clock-dial.

In each ring adjacent to these graduations is an annular groove, *f*, to which the pointers 1, 2, 3, 4, 5, &c., are so fitted that they can be adjusted to any position on the rings, as will be hereafter described.

A stationary ring, G, concentric with those referred to above, is secured to the case A, and that portion of it which is seen beyond the edge of the larger ring F, is graduated to conform to the divisions of time made on the dial-plate and on the movable rings.

The ring G has also, upon its face, a number of annular grooves, there being in the present instance three, marked, respectively, *i*, *i'*, and *i''*, and in each of these grooves is arranged to slide a number of adjustable studs, A, B, C, D, &c., which represent the different stations on the line of the railroad, and which I shall hereafter term station-indices.

A portion only of the movable rings and of the stationary ring G is visible, through an opening in the cover-plate C', and extending beyond this opening, and at each end of the same are three curved slides *k*, each of which is directly over one of the grooves *i* of the plate G, so that by adjusting the opposite slides from or toward each other, the visible portion of each groove may be lengthened or shortened at pleasure.

In fig. 1 of the drawing, the visible portion of the outer groove *i* is the longest, and the station-indices, A, B, C, D, and E are adjusted upon the same, to determined positions.

The next groove *a'* is somewhat shorter, and its station-indices, representing the same stations, are also adjusted to a determined position.

The method of accomplishing this adjustment is as follows:

The time of starting and the number of hours required for the train to complete its trip are first determined, and the indices A and E, representing the termini, are adjusted to positions determined by the running-time, as indicated by the clock, the studs B, C, and D, representing intermediate stations, being adjusted in accordance with the proper running-time between these several stations and those of the termini, the clock and the graduations on the plate G aiding in this adjustment.

The train-pointers are then adjusted on the revolving rings, in such a position, as regards the dial of the clock and the station-indices, that they shall point to the latter at the proper time for the arrival of the train which such pointer represents.

Supposing the train has to start at 2.15 p. m., and that the distance travelled and rate of speed are to be indicated by the pointer 1 of the ring F, and that the station-indices, A to E inclusive, have been adjusted in the groove.

The pointer 1 has been so adjusted upon its ring, that at 2.15 p. m. it shall point directly to the station A. A message is then telegraphed from the central station to the terminus A, authorizing the starting of the train in its course from east to west. (See fig. 1.)

Supposing the train be due at the station B, say at twenty minutes past three, the attendant at the central station examines the instrument, and observes the pointer 1 as it approaches the stud B. If, on the pointer reaching the stud, he has received no telegram announcing the arrival of the train at B, he becomes aware that the train has not been running on time.

Thus the instrument and the telegraph at the different stations serve to indicate to the responsible attendants at the stations the travelling-time and ap-

proximate position of the train throughout its course from one terminus to the other.

If another and a slower train has to follow that above referred to, the studs on another groove are resorted to as station-indices for the slower train, and are consequently placed further apart, but at proportionate distances, so that the pointers, all of which move at the same rate, shall arrive at the proper studs at the proper time.

The instrument, as shown in fig. 1, is arranged for four trains, two running in one direction and two in the other. Thus the groove *i* represents a line of railway, with stations, and on this line are running two trains, in contrary directions, each train being represented by a long pointer 2, one of which only appears in the drawing. The groove *i'* represents the same line of railway, on which two other trains are running at a different rate of speed from the first—one in one direction, and the other in a contrary direction, each train being represented by one of the short pointers, one only of which appears in the drawing.

It will be understood that the grooves and pointers may be multiplied so as to represent additional trains, running over the same railway, at a speed differing from that of the trains referred to above.

On a long line of railroad, where there is a great number of trains and stations, I prefer to carry out my invention, as shown in the diagram, fig. 5. In this case the clock, which is placed in a central position, communicates motion to several shafts *m m m*, each of which operates the train-pointers of a separate indicator, each of which has at least two pointers moving in contrary directions.

I am thus enabled to avoid complication, by using separate indicators, or time-tables for different classes of speed.

It is important for the attendant at the central station, that no more of the stationary and movable graduated rings and the pointers should be exposed to view than are absolutely necessary to enable him to determine the travelling-time and position of the running trains; otherwise the multiplicity of graduations and pointers might tend to confuse him and thwart the object aimed at, which is the discovery of the arrival or non-arrival of a train at a given station at the proper time, a discovery which should be made at a glance, in order to keep pace with the rapid action of the telegrapher. Hence I have covered, with a plate, C', so much of the instrument as need not be seen by the attendant. In some cases, however, the speed of trains is altered, and the visible space should be increased or contracted, in accordance with the speed of the train. Hence the use of the adjustable slides *k k*, in a manner which will be readily understood without description.

It has been remarked above that one of these instruments may be used as a valuable medium for facilitating the arrangement of time-tables, for the use of the engineers and other officers of the road.

The present mode of arranging time-tables is one demanding the greatest care and much tedious calculation, which may be avoided by the employment of the above-described instrument, in the following manner:

The instrument may be placed on a table, and the spindle of the clock provided with a handle, by which the pointers can be operated.

The station-studs, having been previously adjusted in accordance with the running-time, by the aid of the graduations on the rings and those on the dial of the clock, the officer who has to arrange the time-table operates the handle so as to move the station-pointers simultaneously with those of the clock, and he carefully notes the time indicated by the dial when the different pointers arrive at the different stations. Thus the time-table indicating the arrival of the different

trains at the several stations can be readily and accurately determined, without the aid of the large sheets of mapping-paper and the many careful calculations which the usual process requires.

It will be seen that the studs may be arranged in a straight line, and that the pointers may move on this line instead of in a circle.

Without confining myself to any specific mechanism for transmitting motion from the clock to the pointers,

I claim as my invention, and desire to secure by Letters Patent—

1. In combination with a clock or other time-keeper, and operated by the same, one or more pointers, representing a train or trains running in one direction, and one or more pointers representing a train or trains running in the contrary direction, and a number of

station-studs or their equivalents, representing stations on the road, and arranged in accordance with the graduations of the clock-dial and with the running-time of the trains, all substantially as and for the purpose herein set forth.

2. The train-pointers, made adjustable on rings or plates operated by the clock, and graduated in accordance with the dial of the same.

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

A. H. VANCLEVE.

Witnesses:

E. H. BAILEY,
HARRY SMITH.