No. 732,985. PATENTED JULY 7, 1903.

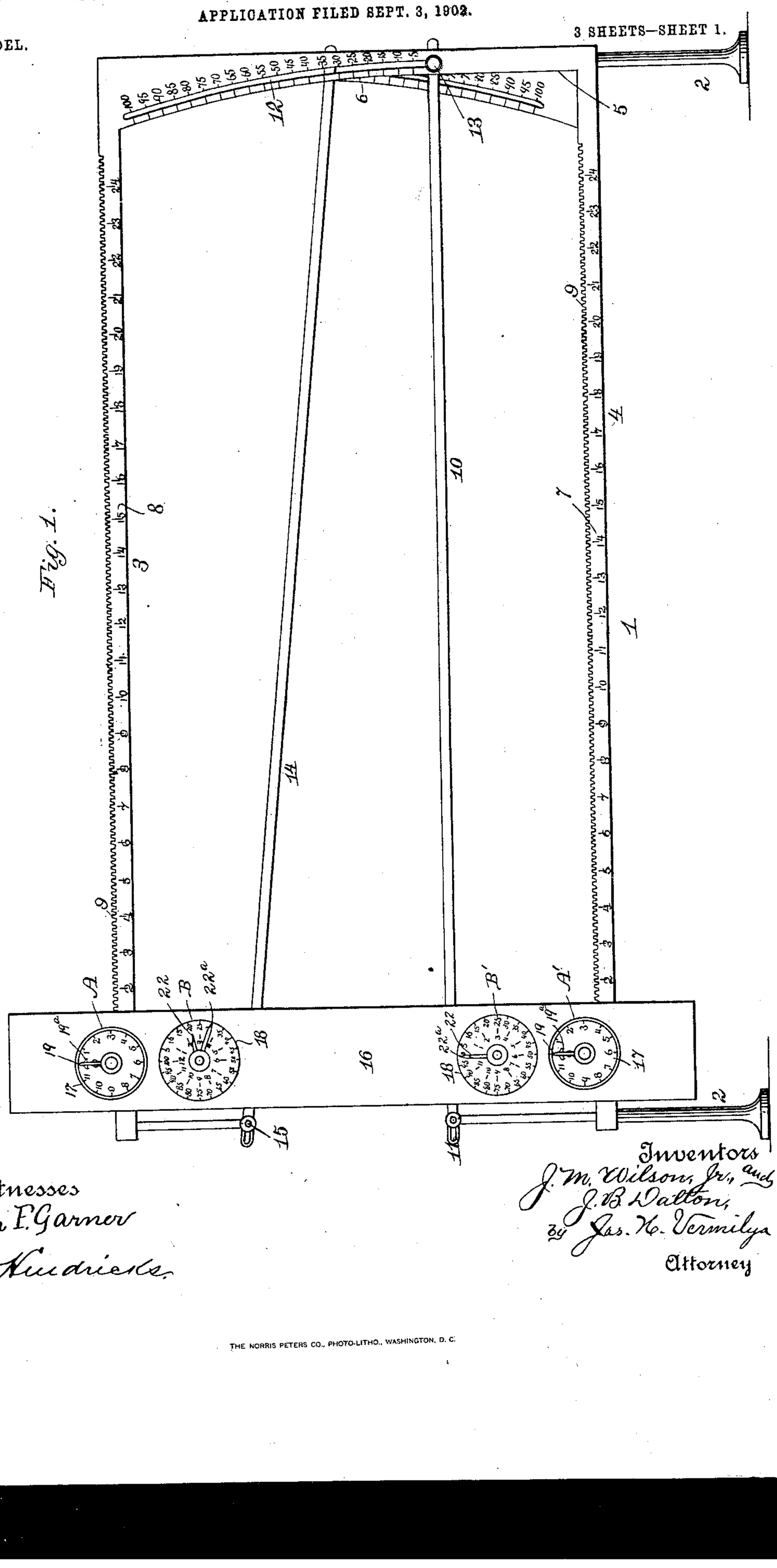
J. M. WILSON, Jr. & J. B. DALTON.

SCHEDULE AND TRAIN CALCULATING MACHINE.

APPLICATION FILED SEPT. 3, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
Alan F. Garner
A. D. Kendricks.

Inventors
J. M. Wilson, Jr., and
J. B. Dalton,
by Jas. N. Vermilya
Attorney

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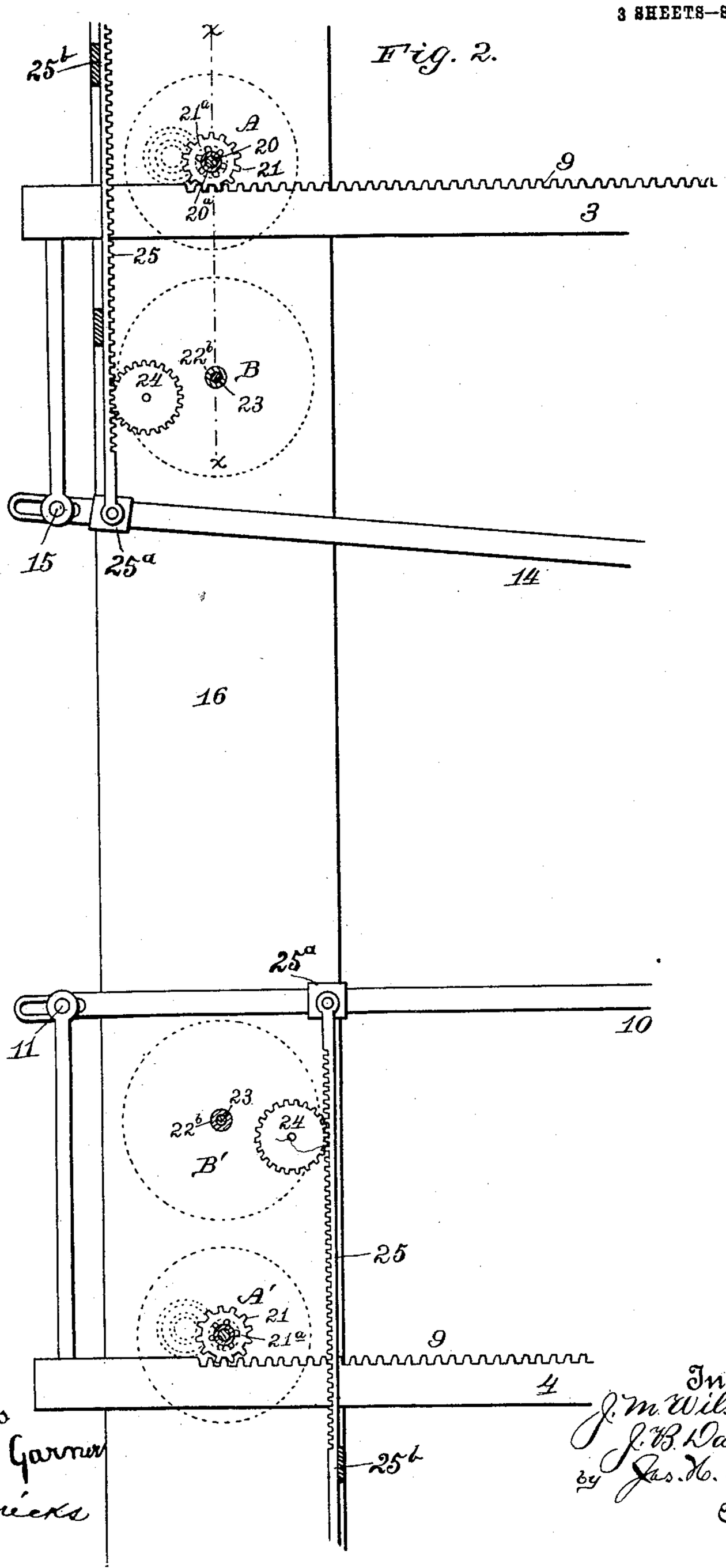
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.

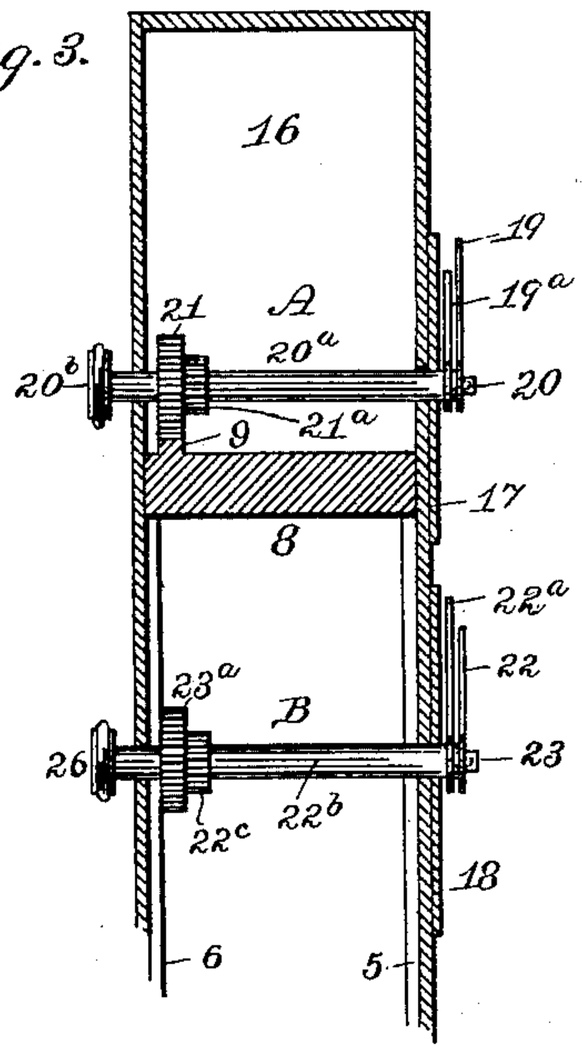


Fig. 4.

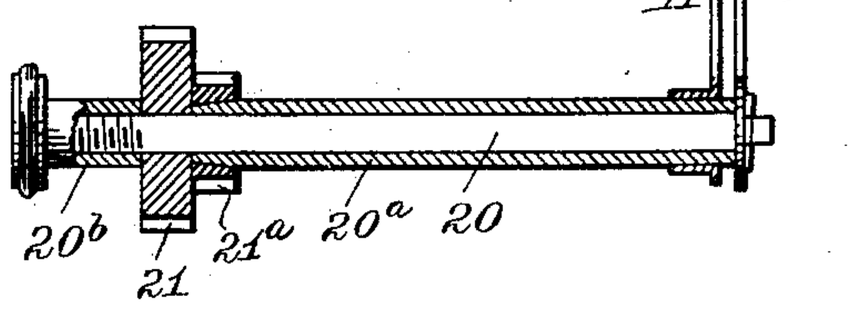
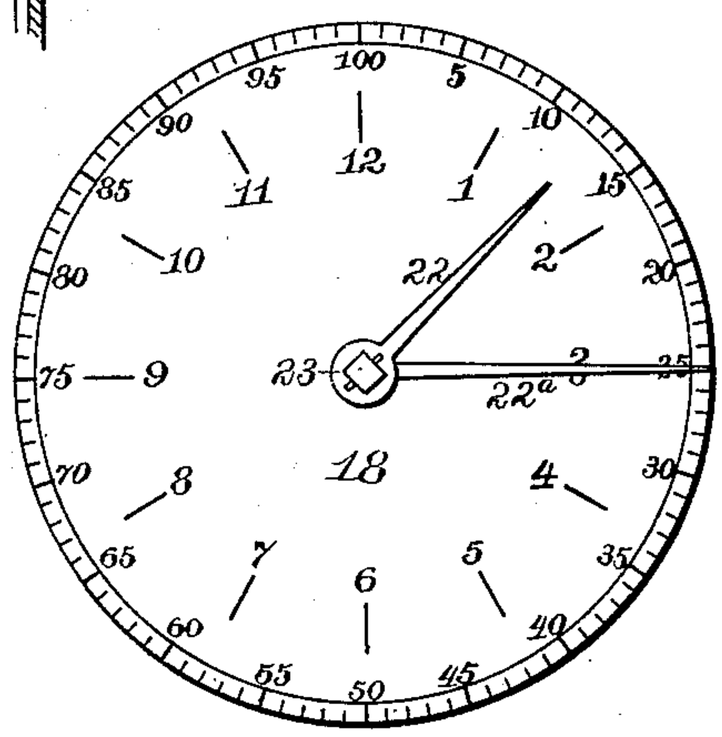


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES M. WILSON, JR., AND JOHN B. DALTON, OF GRAYSVILLE, GEORGIA.

SCHEDULE AND TRAIN CALCULATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 732,985, dated July 7, 1903.

Application filed September 3, 1902. Serial No. 121,976. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. WILSON, Jr., and JOHN B. DALTON, of Graysville, county of Catoosa, State of Georgia, have invented a new and useful Improvement in Schedule and Train Calculating Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

Our invention is an improved schedule and train calculating machine adapted for use in making schedules for railroads and for the assistance of train-despatchers; and it consists in the novel construction and combination of devices hereinafter fully set forth, and particularly pointed out in the appended claims.

In the accompanying drawings, which form part of this specification, Figure 1 is a side elevation of a schedule and train calculating machine embodying our invention. Fig. 2 is a detail sectional view showing the means for operating the time and distance indicating mechanisms. Fig. 3 is a detail sectional view taken on a plane indicated by the line $x\ x$ of Fig. 2. Fig. 4 is a detail view showing the connection between the hands and the arbors which carry them. Fig. 5 is a detail view of the dial of one of the distance-indicating mechanisms.

In the practical embodiment of our invention we construct a frame 1, which is preferably provided at its ends with supporting-legs 2. This frame comprises longitudinally and horizontally disposed upper and lower plates 3 4, respectively, connected together at one end by a pair of vertically-disposed corner-bars 5 6, the latter in rear of the former. These bars are speed-bars, and each is provided with a scale of miles, reversely numbered, the scale on the bar 5 running up and that on the bar 6 running down. The drawings, Fig. 1, show the distance-scales as running from "0" to "100;" but in practice the said scales may be of any extent and should preferably be graduated to indicate the individual miles and subdivisions thereof—say to tenths or twelfths of a mile. On the front of the lower plate 4 is a time-scale 7, on which are marked the hours of a day and which in practice are marked with divisions of the hours. A similar time-scale 8 is on the upper plate 3. Cog-racks 9 are on the said plates and are coextensive in length with the time-scales. An angle-bar 10 is disposed longitudinally of the frame, on the front side thereof, at a suitable height above the lower plate 4, and its left-hand end is supported at a fixed point on a pivot 11. The right-hand end of the front angle-bar is disposed to sweep on the scale of the front distance-bar 5. The latter is here shown as provided with a curved slot 12, concentric with the pivot 11, and the angle-bar 10 is provided with a suitable stop 13, here shown as a set-screw, working in the slot 12, whereby the angle-bar may be secured at any desired point on the distance-bar 5. A rear angle-bar 14, which is similar to the angle-bar 10, is pivoted at its left end at 15. Said rear angle-bar is disposed to sweep over and to coact with the rear distance scale-bar 6.

A vertically-disposed carriage 16 is adapted to travel longitudinally on the frame 1. This carriage is provided with time-indicating mechanisms A A′ and distance-indicating mechanisms B B′. The former are operated by the cog-racks 9 and the latter by the respective angle-bars 14 10. Each time mechanism has a dial 17, and each distance mechanism has a dial 18. The said dials are on the front side of the carriage. Each time mechanism has hands 19 19^a, disposed to sweep on the time-dial. The hand 19 is carried by an arbor 20, which has its bearings in the carriage and is provided with a spur-gear 21, that meshes with one of the cog-racks 9. The hand 19^a, which indicates the hours, is carried by a sleeve 20^a, which revolves on the arbor 20. The gear 21 is loose on the arbor 20, and a pinion 21^a is loose on the sleeve 20^a. A pair of gears differing in diameter and rotating in unison on a suitable support, which gears are indicated in dotted lines in the drawings, respectively engage the gears 21 21^a, whereby the latter is driven appropriately to turn the hour-hand. Hence when the carriage is moved to the right the hands of the time mechanisms will be turned, and the position of the carriage on the time-scales will be indicated by the position of the hands on the dials of the time mechanisms, as will be understood. A clutch sleeve or nut 20^b is screwed on one end of the arbor 20. By loosening this sleeve or nut the hands may be ap-

propriately set without affecting the gears which operate them.

The dials of the distance-indicating mechanisms are numbered to correspond with the distance scale-bars, and each distance-indicating mechanism has hands 22 22ª, which turn on its dial. Each hand 22 is carried by an arbor 23, which may be revolved by a suitable train of gears including an operating-gear 24, that is engaged by a rack-bar 25, which is slidably connected to and is adapted to be actuated by one of the angle-bars. Each rack-bar 25 is here shown as pivotally connected to a sleeve 25ª, slidable on one of the angle-bars, and as slidably engaging one side of the carriage, as at 25ᵇ, whereby it is kept in engagement with its gear 24 at all times. Each hand 22ª is carried by a sleeve 22ᵇ, which revolves on the arbor 23. The latter and the sleeve 22ᵇ are respectively provided with a gear 23ª and a pinion 22ᶜ, engaged, respectively, by appropriate members of the train of gears in the distance mechanism. The gear 23ª and pinion 22ᶜ are loose on their respective arbor and sleeve, and a clutch sleeve or nut 26, similar to the clutch sleeve or nut 20ᵇ hereinbefore described, is screwed on one end of the arbor 23. By loosening this clutch sleeve or nut the hands of the distance mechanism may be appropriately set without affecting the gears which operate them. It will be understood that when the angle-bars are set angularly with relation to the plates 3 4 parallel with the path of the carriage and the latter is moved to the right the distance mechanisms will be operated by the rack-bars 25 at a rate of speed determined by the angles of the angle-bars as indicated on the scales 5 6.

In the operation of the invention the angle-bars are set appropriately on the scales 5 6 to indicate the rate of speed at which the trains are to run, and the hands on the time-dials are set to indicate the time the trains are to start. The hands on the distance-dials are set at "0." By then moving the carriage to the right the dials will indicate the point at which the trains will meet. For instance, assuming that the trains are one hundred miles apart, traveling toward each other at the rate of forty miles per hour, and that they start at twelve o'clock, both the angle-bars being at the same angle with reference to the respective plates 3 4 and the plane of movement of the carriage, the respective distance-indicating mechanisms will operate at the same rate of speed and their hands will indicate "50" on the distance-dials when the hands on the time-dials indicate "1.15." The angle-bars may be set appropriately for trains running at different rates of speed either toward each other or one following the other, the train last started being the faster, and by appropriately operating the machine the same will indicate the point and time where the trains will meet or when and where the slower train will be overtaken by the faster. Hence the utility of the machine for making the necessary calculations for railway time-schedules will be apparent.

We do not desire to limit ourselves to the peculiar construction and combination of devices herein shown and described, as it will be evident that modifications may be made therein within the scope of the appended claims.

Having thus described our invention, we claim—

1. In a schedule-calculating machine, the combination of a fixed distance-scale, with a movable carriage, a time-indicating mechanism, a distance-indicating mechanism, means, operated by the movement of the carriage, to actuate the time-indicating mechanism, an angle-bar, adapted to be set on the fixed speed-scale, and means, actuated by said angle-bar, to operate the distance-indicating mechanism when the carriage is moved, substantially as described.

2. In a schedule-calculating machine, the combination of a fixed distance-scale, with a movable carriage, a time-indicating mechanism, a distance-indicating mechanism, means operated by the movement of the carriage to actuate the time-indicating mechanism, an angle-bar, adapted to be set on the fixed speed-scale, and a rack-and-pinion mechanism, actuated by the angle-bar, to operate the distance-indicating mechanism when the carriage is moved, substantially as described.

In testimony whereof we have set our hands this 29th day of August, A. D. 1902, in the presence of two attesting witnesses.

JAMES M. WILSON, JR.
JOHN B. DALTON.

Witnesses:
G. F. ROBINSON,
L. B. REDMAN.