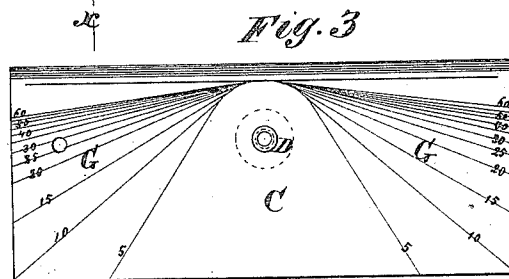
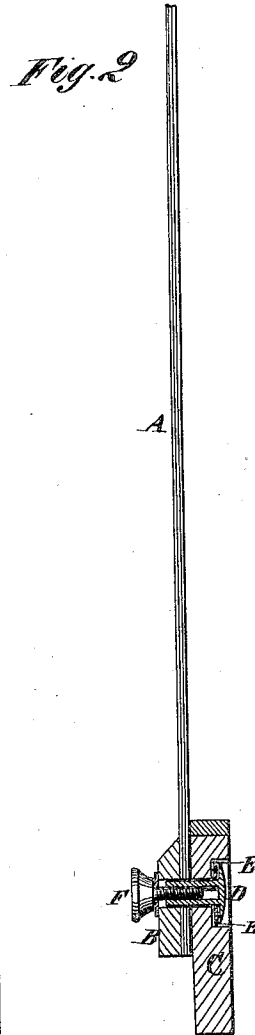
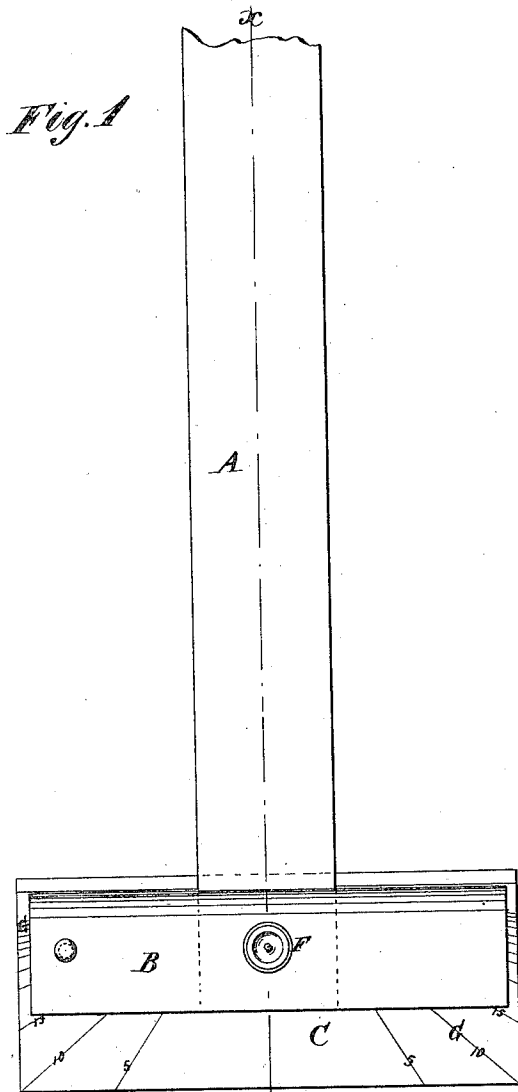


A. HILL.

SPEED-PROTRACTOR FOR RAILROAD TIME-TABLE CHARTS.
No. 172,436.

Patented Jan. 18, 1876.



WITNESSES:

A. W. Mangvick
Alex F. Roberts

INVENTOR:

A. Hill

BY

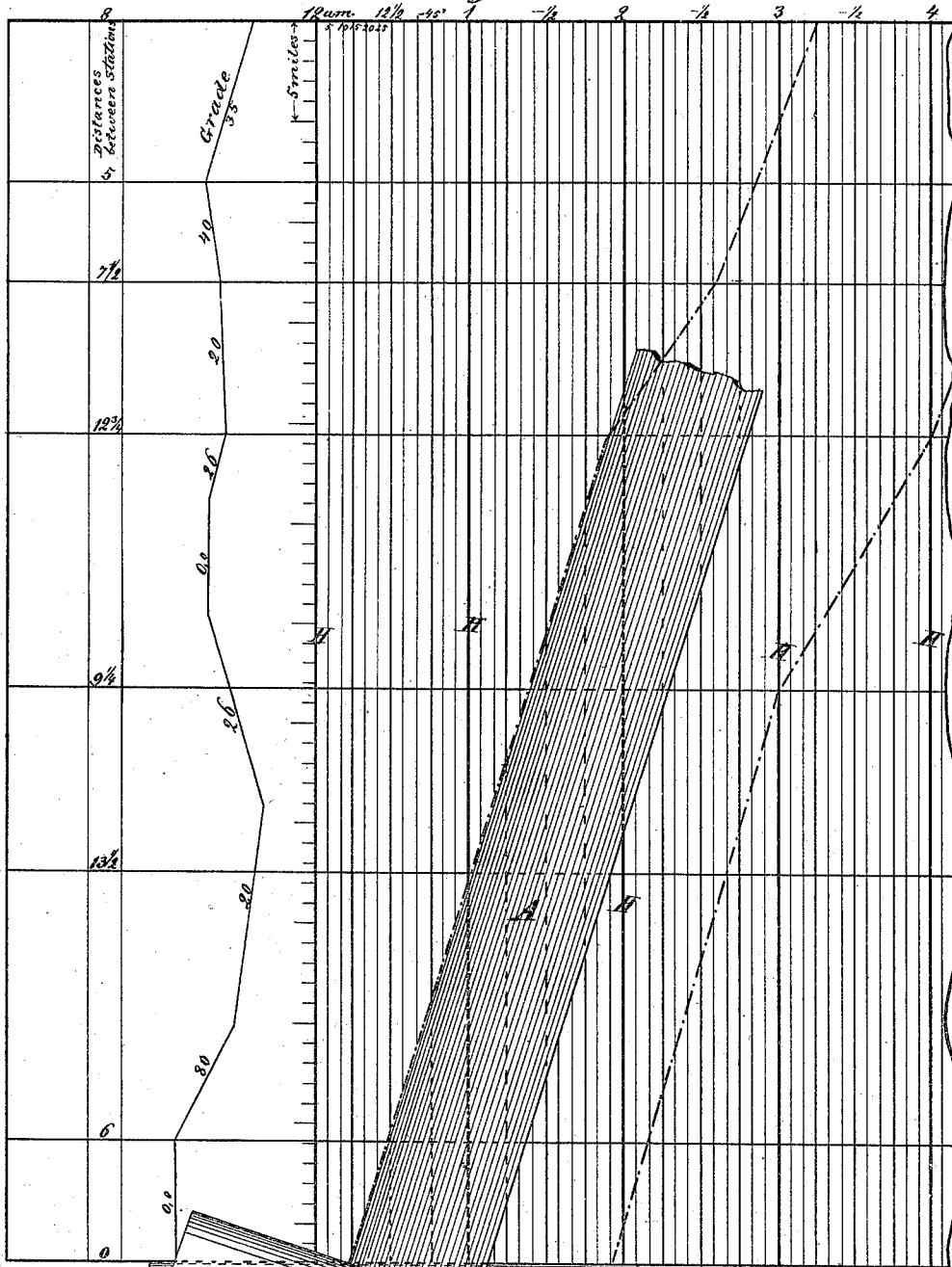
Munn & Co.
ATTORNEYS.

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Fig. 1



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UNITED STATES PATENT OFFICE.

ALBERT HILL, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SPEED-PROTRACTORS FOR RAILROAD TIME-TABLE CHARTS.

Specification forming part of Letters Patent No. **172,436**, dated January 18, 1876; application filed December 4, 1875.

To all whom it may concern:

Be it known that I, ALBERT HILL, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Speed-Protractor for Railroad Time-Table Charts, of which the following is a specification:

Figure 1, Sheet 1, is a plan view of the instrument. Fig. 2, Sheet 1, is a detail section of the same, taken through the line *xx*, Fig. 1. Fig. 3, Sheet 1, is a detail plan view of the lower head. Fig. 4, Sheet 2, is a view illustrating the use of the instrument.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved instrument, by the use of which the construction of railroad time-table charts will be greatly facilitated, inasmuch as the calculations of the speed of trains between stations heretofore necessary will be done away with, the instrument itself showing the speed at once.

The invention consists of an improved instrument, formed of the blade, the rigid head, and the pivoted head, having a speed-scale marked upon its upper surface, to adapt it to be used in constructing railroad time-table charts; and in the pivoted head, provided with a speed-scale upon its surface, in combination with the blade, whether the rigid head be used or not, as hereinafter fully described.

A is the blade of the instrument, which is made of suitable length, breadth, and thickness, and its lower end is firmly secured in a recess in the upper head B, so that the lower surfaces of said blade and head shall be flush. The upper head B is made like the head of an ordinary T-square, except that the edge toward the blade is beveled down to the upper surface of the blade A, as shown in Fig. 2. C is the lower head, which is made a little longer and considerably wider than the upper head B. Through the lower head C, near its center, passes a pivot, D, the head of which is let into the lower surface of said head C, and rests upon a soft washer, E. The pivot D also passes through a corresponding hole in the middle of the upper head B, the center of which hole is in the center line of the blade A. The neck of the pivot D is hollow and screw-threaded for the reception of the clamping-screw F, which screw F serves to fix the

upper head B in any desired position upon the lower head C. Upon the upper surface of the lower head C is marked out the speed-scale G, which, by means of the figures at the end of each scale-line, indicates the number of miles per hour at which the train moves. The scale-lines are symmetrically arranged upon both sides of the pivot D.

In using the instrument, set the beveled edge of the upper head B flush with the first or base line of the scale G, upon the ends of which there is no figure. Then see that either edge of the blade A corresponds with any hour-line, H, of the time-table chart. This being done, loosen the upper head B sufficiently to admit of its motion upon the lower head C. Now move the instrument with either edge of the blade A upon the time-line H, at which you wish to start your train. Then set the beveled edge of the head B flush with the line of the scale, G, indicating the speed desired for your train. The intersection of the edge of the blade A with the hour-line H at the station to be reached will give the time of arrival; or, vice versa, lay the edge of the blade A to correspond with the time of departure and arrival at two stations, respectively, and the position of the beveled edge of the upper head B upon the scale G of the lower head C will at once give the rate of speed necessary to make the distance in the given time.

If desired, the upper head B may be omitted and an index-finger used to point to the lines of the scale G.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An improved instrument, formed of the blade A, the rigid head B, and the pivoted head C, having a speed-scale, G, marked upon its upper surface, to adapt it to be used in constructing railroad time-table charts, substantially as herein shown and described.

2. The pivoted head C, provided with a speed-scale, G, upon its surface, in combination with the blade A, whether the head B be used or not, substantially as herein shown and described.

ALBERT HILL.

Witnesses:

JAMES T. GRAHAM,
T. B. MOSHER.