No. 852,036. PATENTED APR. 30, 1907.

E. ROLLANDET.

REPRODUCING DEVICE.

APPLICATION FILED JUNE 7, 1905.

2 SHEETS—SHEET 1.

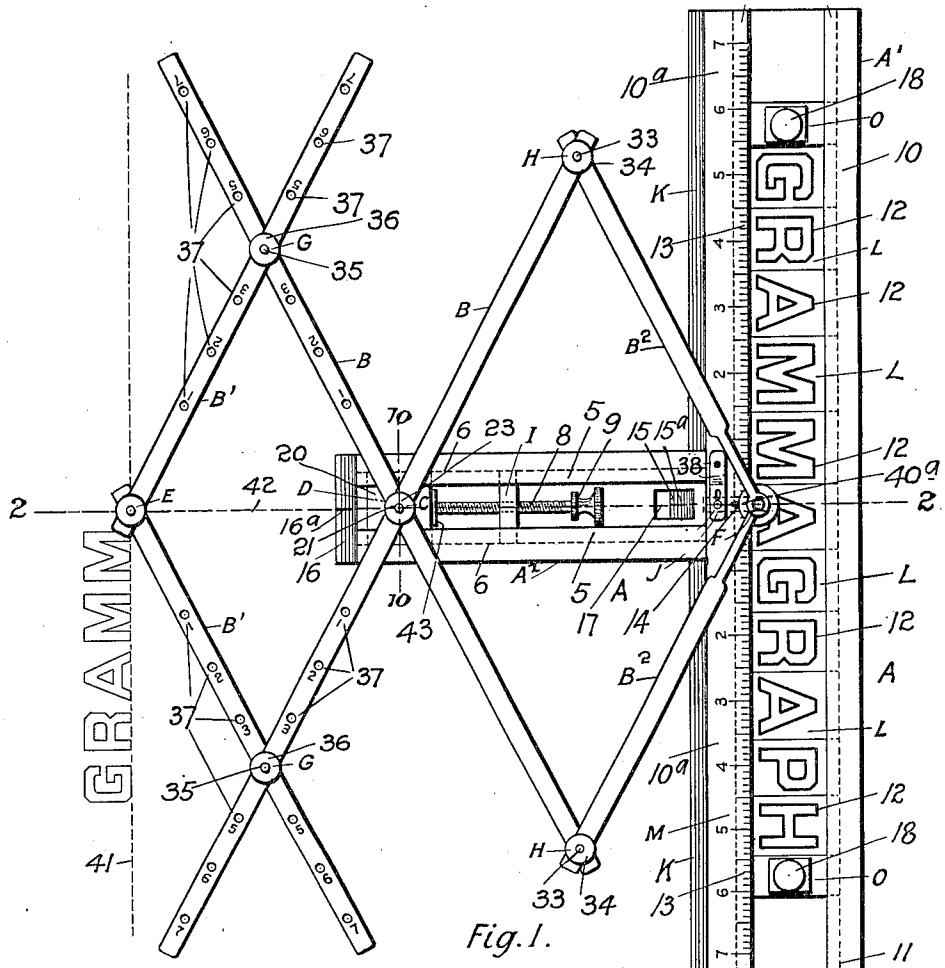


Fig. 1.

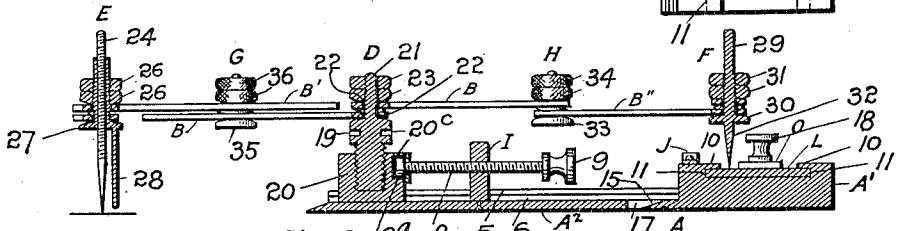


Fig. 2

Witness

P. F. Seymour Jr.

T. M. Stemp Jr.

Edward Rollandet. Inventor

by

G. G. Rollandet.

Attorney

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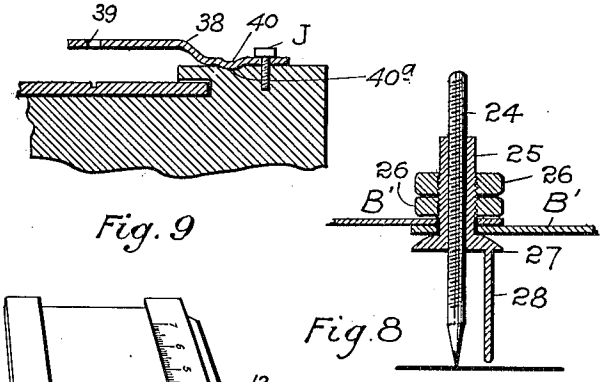


Fig. 9

Fig. 8

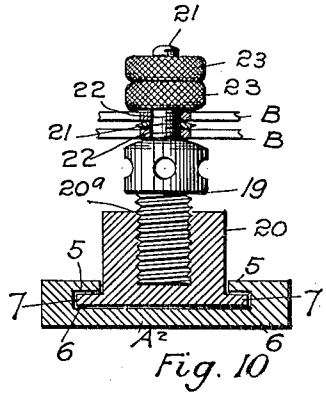


Fig. 10

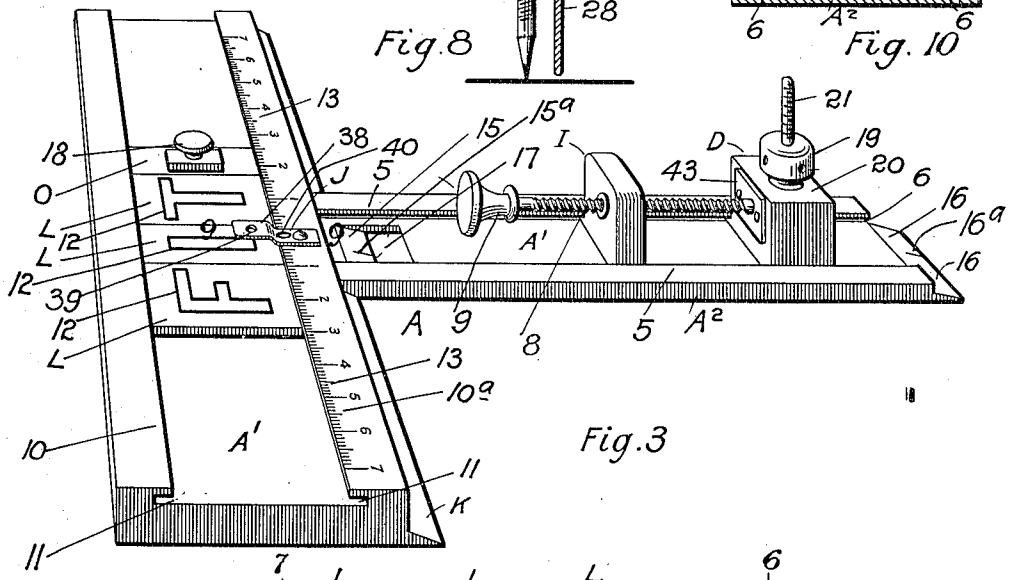


Fig. 3

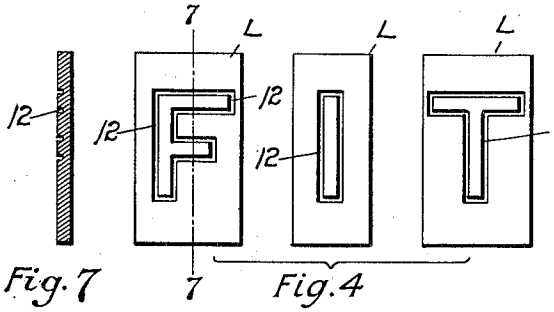


Fig. 7 Fig. 4

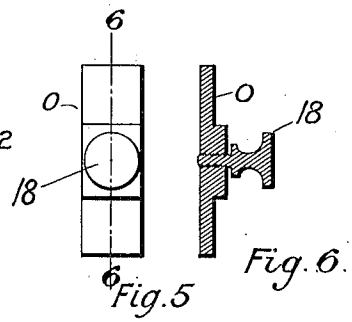


Fig. 5 Fig. 6.

Witness

B. F. Sumner Jr.

F. M. Stumpf

Edward Rollandet. Inventor

by

E. Rollandet

Attorney

UNITED STATES PATENT OFFICE.

EDWARD ROLLANDET, OF PUEBLO, COLORADO.

REPRODUCING DEVICE.

No. 852,036. Specification of Letters Patent. Patented April 30, 1907.

Application filed June 7, 1905. Serial No. 264,156.

To all whom it may concern:

Be it known that I, EDWARD ROLLANDET, a subject to Wilhelmina, Queen of the Netherlands, and who has declared his intention to become a citizen of the United States of America, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented certain new and useful Improvements in Reproducing Devices, of which the following is a specification.

My invention relates to reproducing devices and more particularly to that class of instruments by the use of which, letters, numerals or other designs may be accurately reproduced, either in fac-simile or modified size, upon maps, boards, cards or other flat surfaces.

The objects of my invention are to produce a device of the class named, which, being most simple in construction, may readily and effectively be operated by all persons irrespective of their skill in drafting or lettering, by the use of which letters, numerals or any previously prepared figure or design may faithfully and rapidly be reproduced in fac-simile or in modified size, which may readily be adjusted to reproduce to any of a plurality of predetermined scales at any predetermined point or along any predetermined line on the surface of the drawing, map or board, and by the use of which the letters composing words and sentences to be reproduced, may be accurately spaced without previous or subsequent adjustment. I attain these objects by the mechanism illustrated in the accompanying drawings, in the several views of which, like parts have been similarly designated and in which

Figure 1—represents a plan view of the device showing mode of operation, Fig. 2—a vertical section taken along the line 2—2, Fig. 1, Fig. 3—a perspective view of the base or stationary portion of the apparatus, Fig. 4—a plan view of a number of the copy-plates employed in my device, Fig. 5—a plan view of the clamp-blocks used to secure the copy-plates, Fig. 6—a section taken along the line 6—6, Fig. 5, Fig. 7—a section taken along the line 7—7, Fig. 4, Fig. 8—an enlarged vertical section through the pivoted reproducing-point and adjacent arms of the instrument, Fig. 9—an enlarged vertical section taken through the base and adjusting-plate along line 9—9, Fig. 3, and Fig. 10—an enlarged cross section taken along the line 10—10, Fig. 1.

The stationary portion of my device consists of a T-shaped base A comprising a copy-holder A′ and the centrally located rectangularly extending arm A^2, which supports the longitudinally adjustable pivot-block 20, which provides the fulcrum D for the movable or working parts of the device. Arm A^2 has been provided along its upper surface with elevated parallel, inwardly extending, longitudinal flanges 5, forming guide-ways 6 for the reception of the outwardly extending projections 7 on the lower part of pivot block 20.

A stationary nut I supports the adjusting screw 8, the outer enlarged extremity 8^a of which is secured in a recess 20^c on block 20 by means of a keeper-plate 43 which allows it to turn freely around on its axis, while its opposite end terminates in a milled head 9.

Holder A′ which, during the operation of the device, supports the copy-plates L, consists of an oblong body, provided on its upper surface with longitudinally extending parallel, elevated flanges 10 and 10^a which, like those on arm A^2, are preferably made integral with the main body and form guide-ways 11 adapted to receive the upper and lower edges of the copy- or model- plates L. The latter consist of rectangular plates which being made of metal, hard rubber or other durable substance bear on the upper surface of the letter of design to be reproduced.

The various lines composing these designs are made in the form of narrow, shallow grooves 12, by engraving, etching, stamping or otherwise channeling the upper surface of plate L and are purported to guide the tracing point, as will hereinafter be described.

Part A′ of base A is furthermore provided on its innermost side with a longitudinal rectilinear edge K, while its inner flange 10^a has a graduated scale 13 along its upper surface, the numbered graduations on which extend identically in opposite directions from the center 14 of the device. Arm A^2 has likewise been provided with straight-edges 15 and 16, parallel to the one on holder A′, and bearing painted or indented marks 15^a and 16^a which being located in the center line of the device, insure, in coöperation with edge K, speedy and accurate adjustment of the device along any predetermined line and at any predetermined point. Edge 16 is located along the extreme end of the arm, while edge 15 forms one of the sides of a rectangular aperture 17 cut in arm A^2 near its point of junc-

tion with holder A'. The upper surface of all three edges 15, 16 and K is beveled to promote accuracy of adjustment. Plates L bearing the designs and letters to be reproduced having been inserted in guide-ways 11 on base A may be held against lateral displacement by means of clamp-plates O, which being of a length equal to the copy-plate, are fixed inside the guide-ways and against the two outer plates of the series contained in the holder by means of set screws 18, which extending through correspondingly tapped holes in plates O engage the upper surface of base part A'.

The letters or designs cut in the upper surface of the copy-plates thus secured may be reproduced through instrumentality of a number of interconnected arms pivotally mounted at D on the adjustable block or post 20 and belonging to the class of devices known in the art to which it pertains under the name of pantographs.

The device as employed in my apparatus consists of four graduated arms or bars B, B, B' and B' arranged in pairs and pivotally united at their intersecting points in such a manner that the opposite bars shall, at all times, be parallel to each other. Bars B and B, crossing each other, are fulcrumed at their point of intersection at D upon the adjustable block or post 20, which to this end has been provided with a vertically movable capstan-headed screw 19 extending into a correspondingly tapped hole 20^a in the upper surface of the block. A vertically extending, centrally located, threaded extension 21 on the capstan head passes through corresponding plain holes 22 in arms B and B, the latter being held in position by means of nuts 23. Arms B' and B' intersect at their outer extremities and are pivotally connected at E by the copying or reproducing point 24 which will now be described.

Depending on circumstances, the reproduction may be made in pencil or ink by means of a pencil or drawing pen extending through the extremities of arms B' and which engages the surface on which the copy is to be made. The means illustrated in the drawings consist of a pencil 24, having an external screw thread and extending vertically through a correspondingly tapped sleeve or socket 25, which constitutes the pivot proper. The extremities of arms B' and B', being provided with suitable apertures are placed over the socket and held against vertical deflection by nuts 26. Sleeve 25 has at its lower extremity, an annular flange 27, which forms the support for the lower one of the two arms and which is provided with a downwardly extending leg 28.

During the adjustment of the device prior to making the desired reproduction, pencil 24 is raised sufficiently off the surface on which it rested to bring the lower extremity of leg 28 in contact therewith, so that the arms may be freely moved about without danger of marring the paper or other surface on which the copy is to be made.

29 indicates the tracing point operatively connected with the inner extremities of arms B and B by means of links B^2, which, intersecting at F are pivotally connected by means of point 29. The tracer point consists of an externally threaded metal rod having a shoulder 30 to form a support of arms B^2, which are held against vertical movement by nuts 31.

The lower extremity of the tracer is pointed which adapts it to enter and follow the grooved outlines of the letters or designs on the upper surface of the copy-plates L.

The outer extremities of links B^2 are pivotally connected with the inner extremities of arms B at H by means of bolts 33, having nuts 34, while bars B and B' are united at their points of intersection G by bolts 35 and nuts 36.

It will readily be seen that by the arrangement of bars or levers as described a movement of the tracing point in any direction will result in a similar movement of pencil 24 in opposite direction by reason of their being on opposite sides of the center of motion at D. If points E and F are at equal distances from fulcrum D, the size of the reproduction will be identical to that of the letter or design on the copy-plates, but should the distance between E and D be made smaller or larger than the distance from D to F the copy produced will become in proportion smaller or larger than the original design.

It will thus be seen that the size of the reproduction may be varied by increasing or decreasing the distance from E to D, which is accomplished by adjusting the points of intersection of arms B and B'. These arms have to this end been provided with corresponding series of equidistant apertures 37, similar to those at G and designated by figures which may refer to the degree of enlargement or reduction obtained by moving the pivot points G to each designated point.

When adjusting the device to any predetermined point or line on the drawings, it is of the utmost importance that points E, D and F should be in perfect alinement along the center line of arm A^2 as indicated by mark 15^a and 16^a on edges 15 and 16. To accomplish this I have provided a short arm 38 pivotally secured on the upper surface of the graduated flange 10^a, at a point J in the center line of arm A^2 and the device.

The outer extremity of arm 38, which is slightly raised above the surface of the flange, has been provided with an aperture 39, adapted to receive the point of the tracing rod 29. Arm 38 is normally in the position shown in Fig. 1. When the device is

being adjusted on the map or drawing, arm 38 is turned at right angles to its former position to bring aperture 39 in alinement with points 15^a and 16^a, as well as with the lower or bottom lines of the letters or designs on plates L, the distance between point J and hole 39 being in accordance with the space between point J and the letters on the plates. Point F being placed in the aperture of arm 38 when in this position brings point E in alinement with it as well as with fulcrum D. A protuberance 40 on the under side of the arm, entering a correspondingly shaped recess 40^a in flange 10^a tends to keep the arm in position during the adjustment of the device.

A matter of great importance in the reproduction of words or sentences by means of my device lies in the position of the letters on plates L.

It is a fact known to draftsmen, printers and others whose occupation pertains to the reproduction of letters etc., that the distances between the letters in a word vary according to their form and if the letters on blocks L were produced thereon at equal distances from its side edges it would not only be impossible to obtain properly spaced words but would in many cases distort the letters. For this reason I have varied the width of the plates in accordance with the particular letter on its surface so that no matter which two plates are placed adjoining, the spacing of the letters engraved thereon will ever be according to the requirements. An example may be found in the plates illustrated in Fig. 4, the letters on which are in each instance spaced at different distances from the edges of the plates, while the plates themselves vary in width.

Having thus described the mechanical features of my improved reproducing device, its operation is as follows:—Having determined the place to be occupied on the map or drawing by the letters, words or sentences, the operator draws two lines at right angles to each other, one of which (41, Fig. 1) represents the base line of the letters while the other (42) is the center line of the word to be drawn. Plates L, bearing the desired letters are now placed contiguously in plate holder A′, the bottom part of the letters being adjacent to the graduated flange 10^a. When the desired word is completed it is placed in the center of the slide by bringing the outer edges of the letters on the end plates in register with corresponding graduations of the scales 13 on flange 10^a, after which the type is secured against displacement by clamp-plates O placed at each end. The joint pins at G, having been inserted in corresponding apertures in arms B and B′ in accordance with the desired scale of the reproduction, the device is ready to be placed on the drawing. Arm J, having been turned at right angles to edge K in the position shown in Fig. 2, the tracing point is inserted in aperture 39 and the reproducing point elevated from the surface of the drawing as heretofore described. The device is now moved about until the rectilinear edge of the copy-plate holder is parallel to base line 41, which is accomplished by placing the reproducing point on or above the point of intersection of lines 41 and 42 and notches 15^a and 16^a, in corresponding points of the latter. This position may be more accurately adjusted by slightly changing the position of fulcrum D by turning adjusting screw 8, while the vertical distance between the paper and the pantographic arms is regulated through instrumentality of the capstan-headed screw 19. The above described adjustments having been completed, the tracing point is lifted out of the small hole in arm 38 and the latter replaced in its original position parallel with straight edge K, the reproducing point is now brought in engagement with the surface of the paper and the reproduction made by permitting the point F to follow the grooves 12 which outline the letters on plates L. In case the word or sentence to be reproduced contains more words than can be placed at one time in holder A′, the operator draws a pencil line along edge K and having removed plates L with the exception of the last one, inserts the plates, the letters on which form the continuation of the word or sentence into the recess of the holder. The type may be once more adjusted to the center of the device and edge K, moved along the previously drawn line or its extension until the last letter which was retained in the holder coincides with the corresponding letter of the reproduction, which may readily be determined by placing the tracing and reproducing points in corresponding points of said letters. The above described operation is now repeated until the entire word or sentence has been reproduced.

Having thus described my invention what I claim is:

1. In a reproducing device, a base comprising a copy-plate holder having a beveled edge and a centrally located arm connected to said beveled edge and extending at right angles to said holder, said arm having a recess adjacent its attached end, the outer end wall for said recess and the free end of the arm being parallel to the beveled edge of the holder, said beveled portions of the arm having marks thereon designating a line extending at right angles to said edge, copy plates in said holder and pantographic reproducing means including a reproducing and a tracing point mounted on said arm in operative relation to said plates.

2. In a reproducing device a base comprising a copy-plate holder having a longitudinal guideway therein and a centrally located arm extending at right angles to said holder,

and having longitudinally extending guide-ways, a fulcrum block movably mounted in said ways in the arm, an adjusting screw mounted in a stationary nut on said arm and operatively connected with said block to move the same back and forth longitudinally, copy-plates movable in the guide way in said holder, and pantographic reproducing means pivotally mounted on said block in operative relation to said plates.

3. In a reproducing device, a base comprising a copy-plate holder and a centrally located arm extending at right angles thereto, and having longitudinally extending guide-ways, a fulcrum block movably mounted in said ways, an adjusting screw mounted in a stationary nut on said arm, and operatively connected with said block, and vertically adjustable pantographic reproducing means pivotally mounted on said block in operative relation to copy-plates in the said holder.

4. A reproducing device comprising a movable base having means to hold a plurality of copy-plates, intersecting graduated arms pivotally mounted on said base at their point of intersection, intersecting graduated arms carrying a reproducing point at their point of intersection, adjustably secured to the first named arms in parallel relation thereto and intersecting links carrying a tracing point their point of intersection pivotally secured to the opposite extremities of said arms in parallel relation thereto and in operative relation to said copy-plates.

5. A reproducing device comprising a base having means to hold a plurality of design-bearing copy-plates and a centrally located outwardly extending arm, pantographic reproducing means including a reproducing and a tracing point mounted on said arm to bring the last named point in operative relation to said plates, and an apertured arm movably mounted on said base and adapted to support the tracing point in its aperture at a predetermined point.

6. A reproducing device comprising a base having means to hold a plurality of design-bearing copy-plates, and a centrally located, outwardly extending arm, pantographic reproducing means including a reproducing and a tracing point mounted on said arm to bring the last named point in operative relation to said plates, and means on said base to hold said tracing point at the point of intersection of the base line of the design on said plates and the center line on the said base.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWARD ROLLANDET.

Witnesses:

B. GREENWOOD,

S. G. JEFFORDS.