LUCIEN F BRUCE *and* NEWLAN J WOLCOTT.

IMPROVED DELINEATOR.

[82.]

No. 118,902. Patented Sep. 12, 1871

FIG. 1

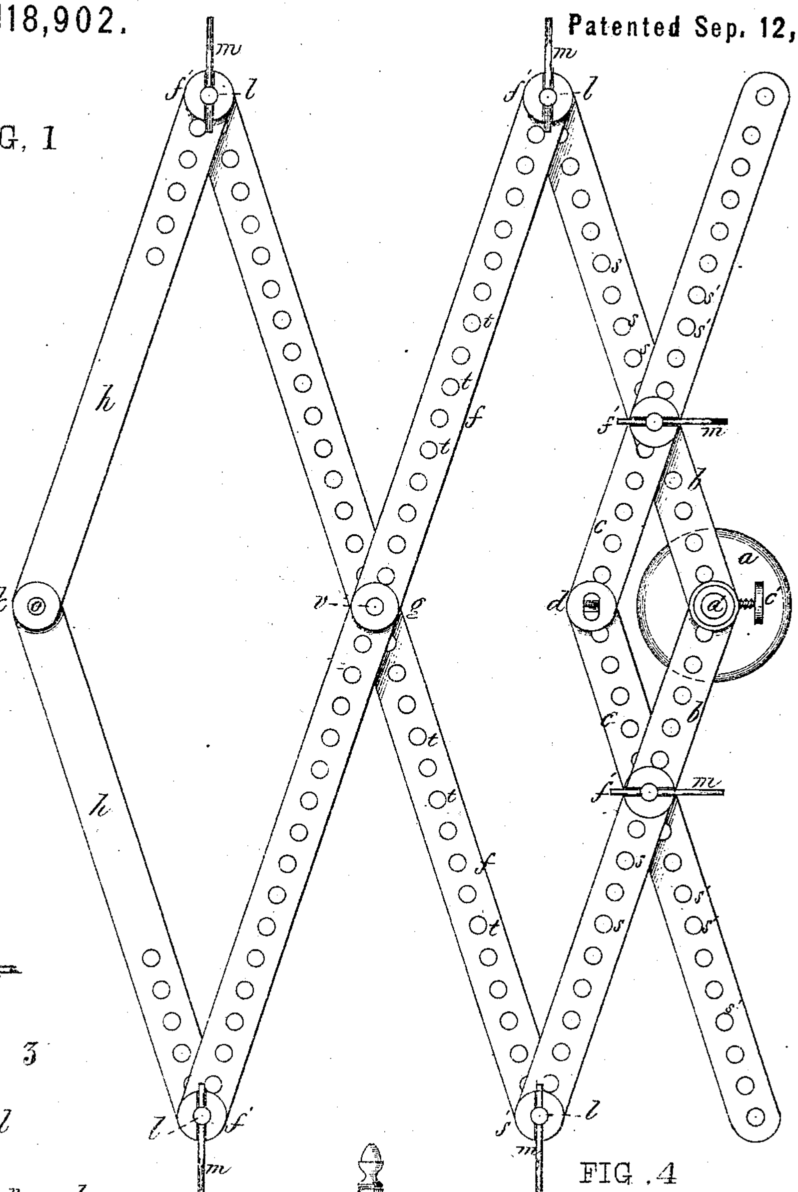


FIG. 6

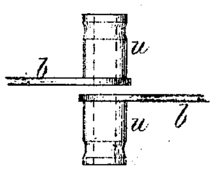


FIG 3

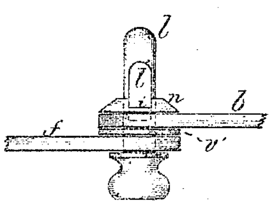


FIG. 2

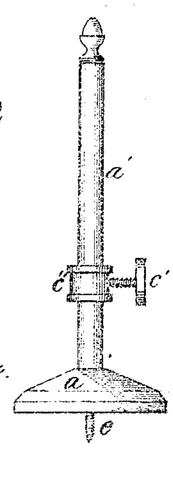


FIG. 4

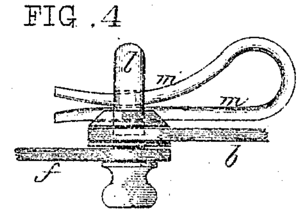
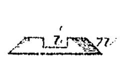


FIG. 5



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UNITED STATES PATENT OFFICE.

LUCIEN F. BRUCE AND NEWLAN J. WOLCOTT, OF SPRINGFIELD, MASS.

IMPROVEMENT IN PANTOGRAPHS.

Specification forming part of Letters Patent No. 118,902, dated September 12, 1871.

To all whom it may concern:

Be it known that we, LUCIEN F. BRUCE and NEWLAN J. WOLCOTT, both of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improved Delineator; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a plan view of our invention. Fig. 2 is a side view of the pivot-post. Fig. 3 is a front view of one of the joints. Fig. 4 is a side view of the same with the fastening-pin therein. Fig. 5 is a side view of one of the washers of the joint, and Fig. 6 is a front view of the supporting-collars on the bars.

Our invention relates to the construction and arrangement of a delineator, whereby greater accuracy and scope is attained in copying drawings, either in reducing or enlarging them; and it consists of a pivot-post having a screw-point and collar at the lower end, by means of which the same is firmly secured to the table or drawing-board. To this pivot-post are hung two bars, set at any desired height by means of a collar and set-screw upon the post, and to these two bars is jointed a series of other bars, and in such manner that the space or spaces inclosed shall have four sides, two of which are always parallel; and there may be one or more of said spaces, according as it is desired to enlarge or diminish the scope of the instrument. At the end of the instrument opposite the pivot-post is attached a tube or other device for holding the pencil, and two other bars, jointed or pivoted together at the ends, are also pivoted to the two bars attached to the pivot-post in such a manner that the space inclosed between the two former and the two latter has four sides, two of which are parallel, and the size of this space is proportional to the space or spaces inclosed by the series of longer bars first mentioned. The tracing-point, in enlarging drawings, is placed at the first joint nearest the pivot-post, between the said post and the pencil. In reducing drawings the pencil may be placed nearest the pivot-post and the tracing-point furthest from the pivot-post, and in either case, in all the operations of drawing, all the working points of the instrument—that is to say, the pivot-post, tracing-point, and pencil—are always in a straight line with reference to each other, and remain so, whether brought near together or carried further apart. The pivot which secures the bars together at the joints has an elongated hole, and a small washer placed upon the pivot has a gain made on the upper side corresponding in width with the width of the hole, and the pivot is retained in place by means of a bent spring-pin inserted in said hole.

That others skilled in the art may be able to make and use our invention, we will proceed to describe the same and its operation.

In the drawing, a' is the pivot-post, terminating at the lower end in a screw-point, e, above which, and firmly secured to the post, is the collar a, which should be made hollow; and a smaller collar, c'', which fits the post properly, is made adjustable and is secured to any desired height by means of the set-screw c'. Each bar b has a collar, u, upon the end, which fits properly the pivot-post to keep the bars firm and steady thereon; and a series of holes, s, is made in said bars at regular distances from the pivot-post, and which may be numbered each way from said post. To the ends of the bars b are jointed or pivoted the bars f, which are just twice the length of the bars b, and said bars f are also pivoted in the middle at g, with a hole v for either a point or pencil to be inserted, and to the ends of the bars f are pivoted the bars h, which are also pivoted together at k, with a hole, o, therein for the insertion of a pencil or point. The two bars c are permanently jointed or pivoted at d with a tube at the center for the insertion of a tracing-point, and said bars are perforated at equal distances from the joint d, and said holes may be numbered commencing from said joint. The bars c are pivoted to the bars b at any desirable distance from the pivot-post a' by means of a pivot inserted through the holes s and s', and the bars f are perforated at equal distances, t, from the middle joint g. The joints are all made so that the bars may be moved freely to or from the pivot-post, and yet so firmly jointed that the instrument shall not have the least lost motion. To accomplish this, the joints at k and g are made permanent by riveting nicely the bars together with a washer between, while the pivots which are used to effect the temporary attachment of the bars c to the bars b, and also the attachment of the extreme outer ends of the bars

at f', are made as shown in Figs. 3 and 4, in which l is the pivot, having a head, w, upon the lower end, and an elongated hole, l', near the upper end, as shown in Fig. 3. The pivot l is inserted through any two holes in the bars from below, with a washer, v', between the bars to diminish the friction; and the washer n has a gain, i, made in the upper side, of the same width as the hole l'. When the gain in said washer and the hole coincide, as shown in Fig. 3, the pin m is inserted into the hole l', fitting properly therein, said pin being doubled or bent over at m', both ends passing into the holes, and the part m' having a tendency to spring upward and away from the part m. The washer n is always pressed down firmly upon the bar, and the spring-pin m cannot become detached and lost. The bars are thus kept firmly pressed together, and yet the pivot is quite free to turn. All the joints at f' are arranged in this way in order that they may be easily and quickly disconnected and connected again in arranging new and different proportions. The pivot-post a', pencil, and tracing-point are all in line, the same as the common pantographs now in use, and tubes may be attached at the points when the pencil and point are used, so that they may be inserted and kept in place by any convenient device.

In using the instrument the collars u are both removed from the pivot-post, and the point e is then screwed into the table or drawing-board; the collar c'' is elevated to the proper height, so that, the collars u resting thereon, the series of bars may remain in about a horizontal position, with the points of the tracing-needle at d and the pencil at k quite near the paper, which is fastened beneath. If, in this position, and the bars all connected, as in Fig. 1, the picture or figure which it is wished to copy be placed beneath the point at d, an enlarged copy will be produced upon the paper at k by taking hold of the pencil at k, and, with its point resting upon the paper, keeping the eye upon the tracing-point at d, moving the pencil and series of bars so that the point will follow the outline of the picture placed beneath the point at d.

A great variety of combinations may be produced in the use of this instrument by changes in the temporary connections at f' and by changing the places of the pencil and point. A reduced copy of the original is produced by placing the tracing-point at k and the pencil at d. Each hole in each bar is numbered, commencing at the points a', d, g, and k, and numbering each way, and thus it is quite simple to make any connection desired. For instance, at the points f' nearest the pivot-post a' the pivot l is inserted in hole number 6, both in the bars b and c, upon both sides of the post a'. A great variety of correct geometrical figures which are irregular in form may be made directly from those which are regular in form, and this feature is a very desirable one, particularly where such irregular figures are somewhat difficult to make mathematically correct. If the pivot l be inserted in the end hole of both bars h and in any other than the end hole of the bar f—say, the fourth from the end—and a true circle be described and placed beneath the point at d, if the pencil be moved upon the paper with the point following the circle the pencil will describe an ellipse which will be longer or shorter in its major axis as compared with its minor axis, according as the pivot is placed in a hole in the bar f near to or more remote from its end. If the pivot l be inserted in the eighth hole, for instance, in the bars c, and in the fifth hole in the bars b, a perfect oval or egg-shaped figure will be described by the pencil in tracing the point around a true circle. If the pivot l be inserted through the end holes in the bars f and any hole more remote from the end in the bars h—say, the fifth—and a right-angled figure having equal sides be placed beneath the tracing-point at d, the pencil will describe a true parallelogram whose angles are all right angles.

It will thus be seen that this instrument has almost unlimited scope, and a very great variety of changes or combinations may be made by making the connections at different holes in the series of bars, and as all the holes are numbered the operator, by a very little practice, may soon be able to make the connections at any certain holes to produce any size of picture or figure desired. The instrument might be used by omitting entirely the bars f and attaching the ends of the bars h to the ends of the bars b, but its scope would be very much more limited and its multiplying and reducing power very much diminished.

We are aware that pantographs and delineators have heretofore been made and used; but never, to our knowledge, has a device like that hereinbefore described been known or used previous to our invention thereof.

Having, therefore, described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the pivot-post a' and a series of bars perforated at equal distances each way from the pivot-post a' and points d, v, and k, for making temporary connections, all constructed and arranged substantially as and for the purpose described.

2. An improved delineator, wherein the fixed central point a', the tracing-point d, and the delineating-point k are all in a straight line with reference to each other, and are also located at the angles where the bars are connected together, substantially as described.

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