

H. A. VERBECK.  
PANTOGRAPH.  
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925,669.

Patented June 22, 1909.

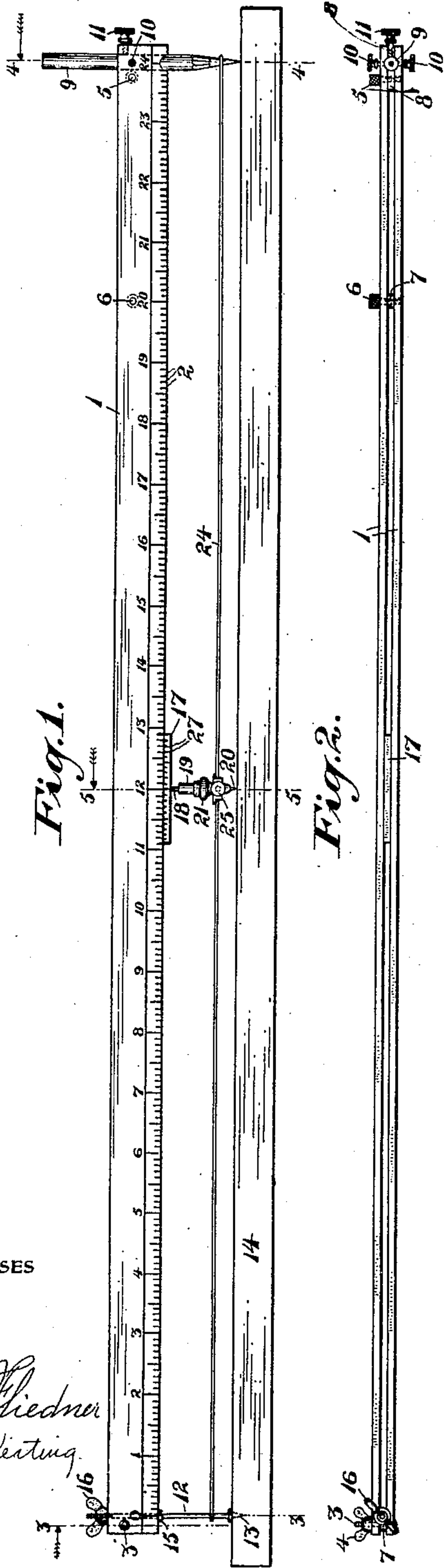


Fig. 1.

Fig. 2.



Fig. 6.

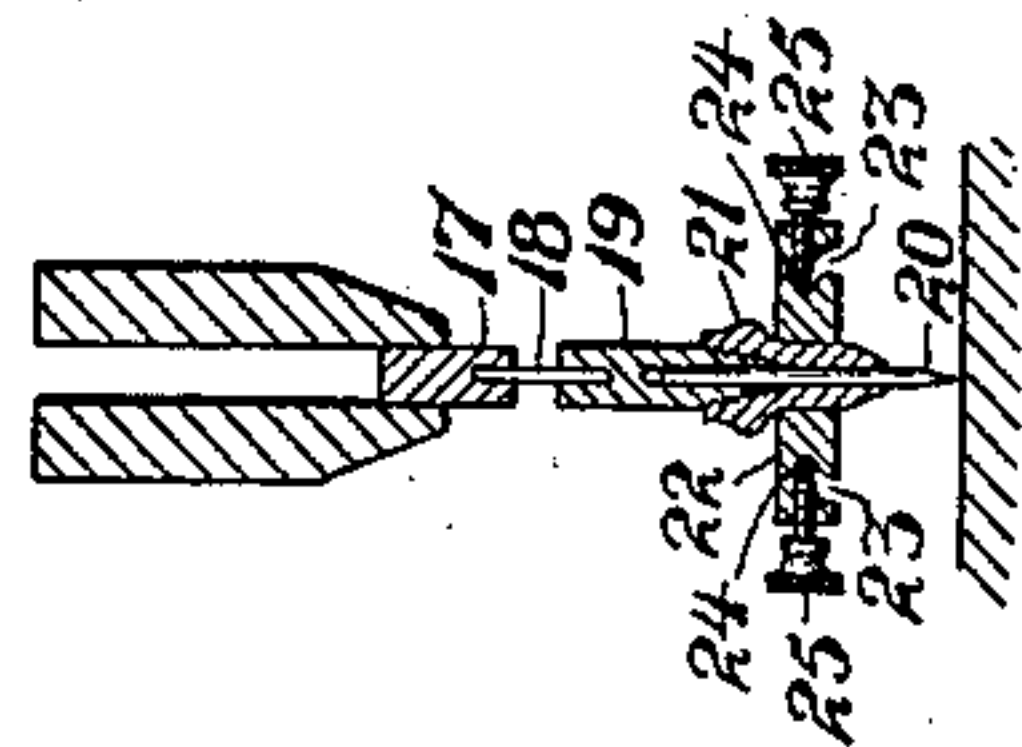


Fig. 5.

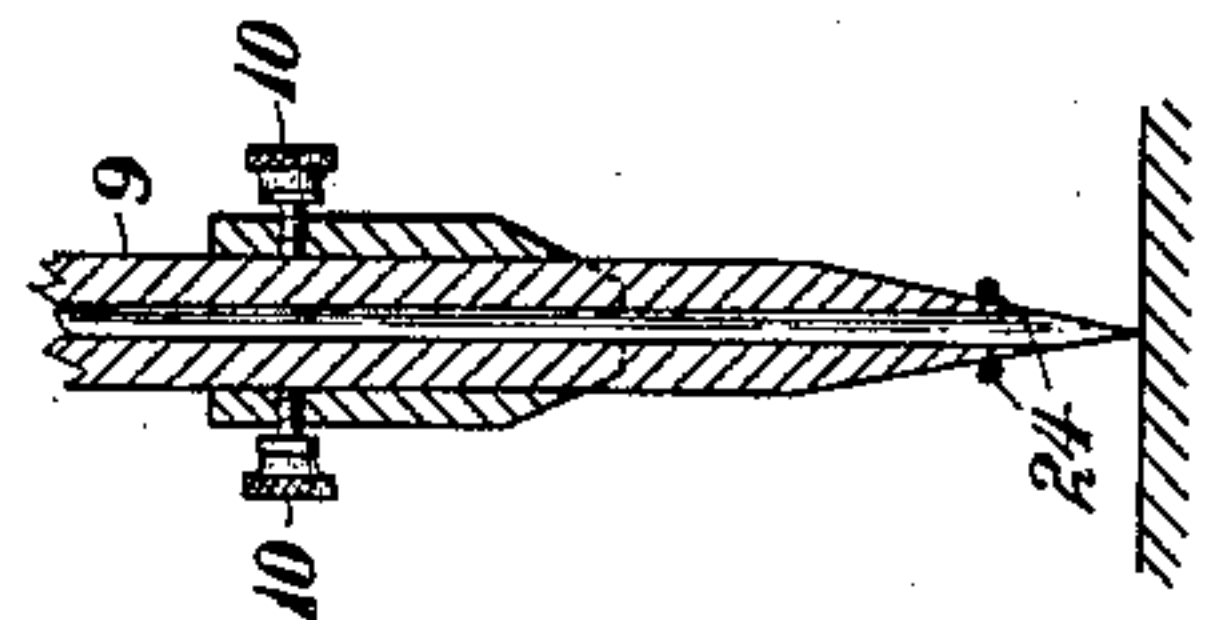


Fig. 4.

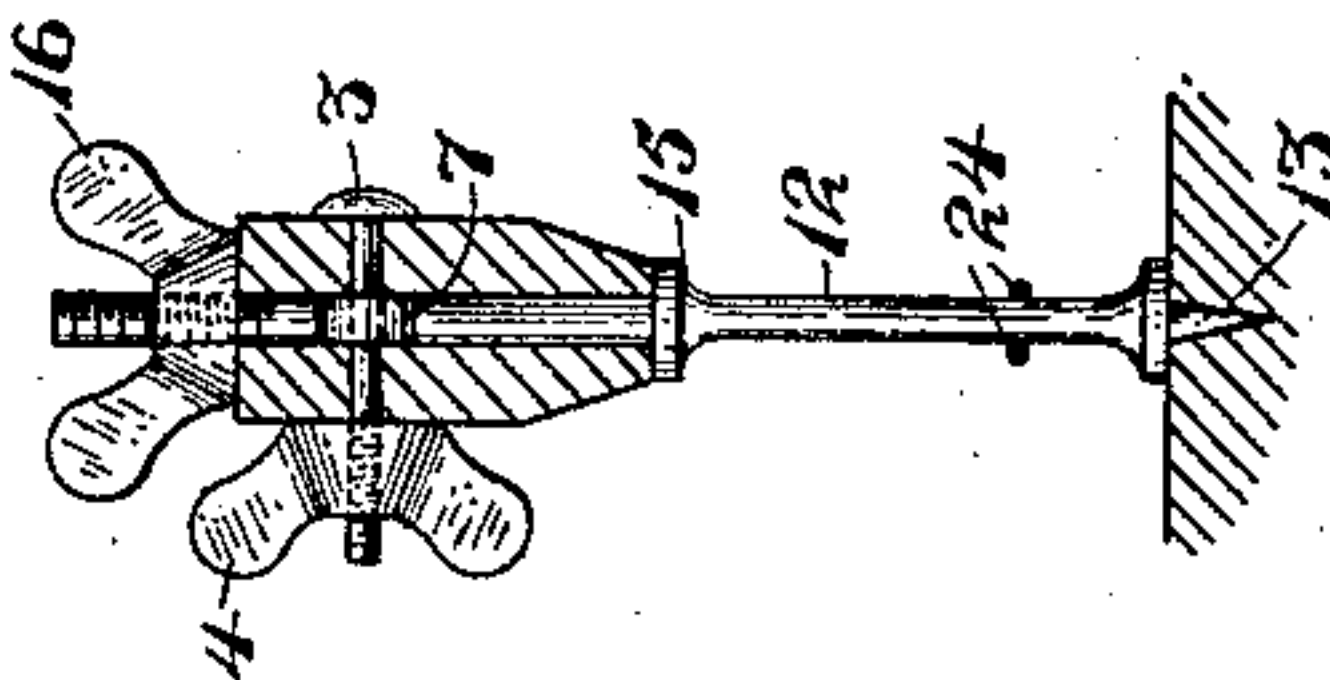


Fig. 3.

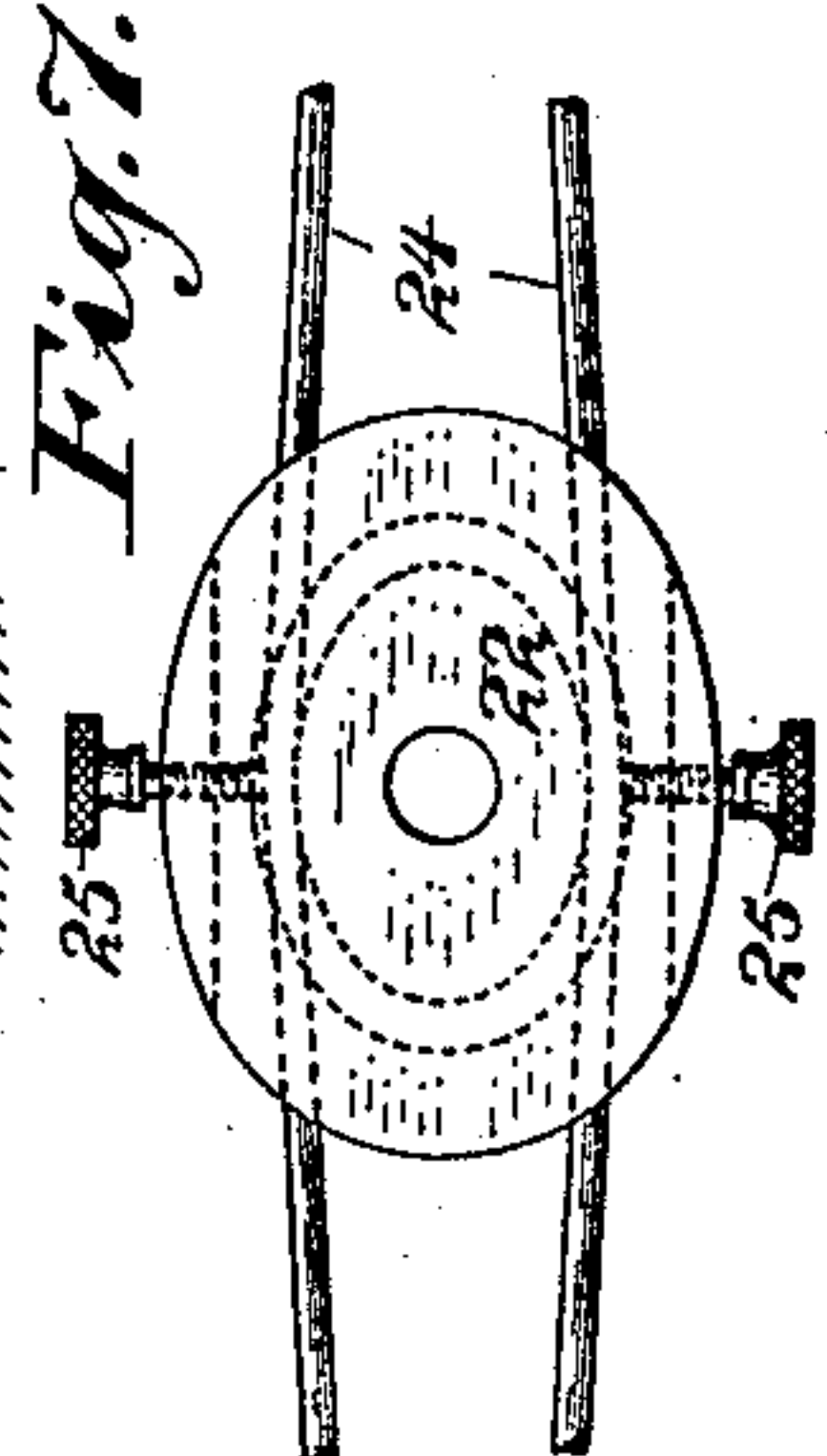


Fig. 7.

WITNESSES

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# UNITED STATES PATENT OFFICE.

HUGO A. VERBECK, OF SAN FRANCISCO, CALIFORNIA.

## PANTOGRAPH.

No. 925,669.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed February 1, 1909. Serial No. 475,419.

*To all whom it may concern:*

Be it known that I, HUGO A. VERBECK, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Pantographs, of which the following is a specification.

The object of the present invention is to provide a simple, effective and convenient form of pantograph.

In the accompanying drawing, Figure 1 is a side view of my improved instrument; Fig. 2 is a plan view; Fig. 3 is a section of the same on the line 3—3 of Fig. 1, on an enlarged scale; Fig. 4 is a section on the line 4—4 of Fig. 1; Fig. 5 is a similar view on the line 5—5 of Fig. 1; Fig. 6 is a still more enlarged vertical section of the holder for the stylus; Fig. 7 is a plan view of the traveler.

Referring to the drawing, 1 indicates two thin wide strips of wood or other suitable material, similar to the flat rulers in common use, arranged parallel with each other and spaced at a short distance apart, beveled at the lower edges of their outer sides, and suitably graduated as shown at 2. They are connected by a bolt 3 having a thumb nut 4 at one end, by a screw 5 near the other end, and also by a screw 6 at said other end but more remote therefrom than the screw 5. Between the strips, and around the screws and bolt, are spacing blocks 7. Also between the strips at the end next to the screw 5 are spacing blocks 8, 8'. Between said strips and spacing blocks 8, 8' a marking pencil 9 is firmly, but removably, clamped by side screws 10 through the strips, and an end screw 11 through the block 8. Between the strips of wood at the other end is a post 12, formed at the lower end with a point 13, which can be inserted in the drawing board 14 or other surface on which is the figure to be enlarged. Said post is formed at about the middle of its height with a shoulder 15, and the upper portion of said post, above said shoulder, is cylindrical in form and is threaded at the upper end to receive a thumb nut 16. Said thumb nut is screwed down upon said post so as to contact lightly with the upper edges of the strips when their lower edges rest upon the shoulder 15, so as to permit said strips to slide freely between said nut and shoulder and on opposite sides of said post, and also to turn around the same.

Between the lower edges of the two strips

in the mediate portion thereof is a comparatively long guide strip 17, which is in light contact with the inner surfaces of said strips, and is guided thereby in its movement between the strips. In the under side of said guide is a metal pin 18, which also enters the top of a holder 19 having a split tapering externally threaded lower end, formed with a socket to receive a stylus or tracer 20, a sleeve 21 around said stylus being screwed on said threaded lower end to clamp the stylus within the holder. Said sleeve 21 fits snugly in a hole formed in a traveler 22, which is formed at the sides with grooves 23 in which the sides of a continuous loop 24, of soft rubber or other elastic material, are secured by clamping screws 25 screwed through the sides of the traveler. Thus said tracer moves from and to the post with the sides of the loop, as the latter is more or less stretched. One end of said loop passes around the lower end of the marking pencil 9, and the other end passes around the lower portion of the post 12.

The instrument is used in the following manner. The post is first fixed by inserting its point in the drawing board 14 or other support for the paper. Then, in the normal position of rest, the elastic loop draws the pencil to the post until the spacing block around the screw 6 abuts against the post, the tracer then assuming a position substantially midway between said block and the pencil. The operator takes hold of the pencil and moves it into such a position that the point of the tracer is on the outline of the figure to be enlarged. He then, watching the point of the tracer, moves the pencil so that the point of the tracer follows the outline to be enlarged, the two strips turning around the post and also sliding between the shoulder and nut on the post, as the outline of the figure approaches or recedes from the post. If, while doing so, the pencil is depressed upon the paper, it will form an exact enlargement of said outline, for the reason that the distance of the pencil from the post bears a constant ratio to the distance of the tracer from the post. The graduation 2 affords a convenient means for varying the degree of enlargement. To do so, the elastic loop is first stretched until the post is exactly opposite to the zero point of the graduation, and the nut 16 is then firmly clamped down so that the strips 1 are fixed to the post. While maintaining the strips in this condi-



tion, the clamping screws 25 are loosened, and the traveler is then moved so as to assume the proper position relatively to the sides of the loop, as indicated by the graduations. If, for instance, it is desired to enlarge a figure to three times its size, the traveler is moved to the point marked "8" of the graduations, the total distance of the pencil from the post being 24 graduations. Having first insured that the elastic loop has been uniformly stretched past the traveler while in this position, the clamping screws 25 are then screwed in, to clamp the loop to the traveler, the thumb nut 6 is loosened, and the device is ready for use. The guide strip 17 is also graduated, as shown at 27, to form a vernier, although this use is rarely needed.

I claim:—

1. In a pantograph, the combination of a post, a marking device, a tracer, an elastic connection between said marking device and post and secured to the tracer, two parallel strips secured to the marking device at one end and slidable on opposite sides of the post at the other end, the tracer having a part

slidable between said strips, substantially as described.

2. The combination of a post, a marking device, a traveler, a tracer mounted therein, a loop of elastic material passing around the post and marking device, and means for variably securing the sides of said loop to said traveler, substantially as described.

3. The combination of a post, a marking device, a tracer holder, a tracer mounted therein, a loop of elastic material passing around the post and marking device, means for connecting the sides of said loop to said holder, and a guide fixedly secured to one of the three elements, the post, the marking device, and the holder, and having slidable engagements with the other elements, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HUGO A. VERBECK.

Witnesses:

F. M. WRIGHT,  
D. B. RICHARDS.