

H. S. NUNAMAKER.
DRAFTING AND ENGRAVING MACHINE.
APPLICATION FILED FEB. 13, 1909.

943,886.

Patented Dec. 21, 1909.

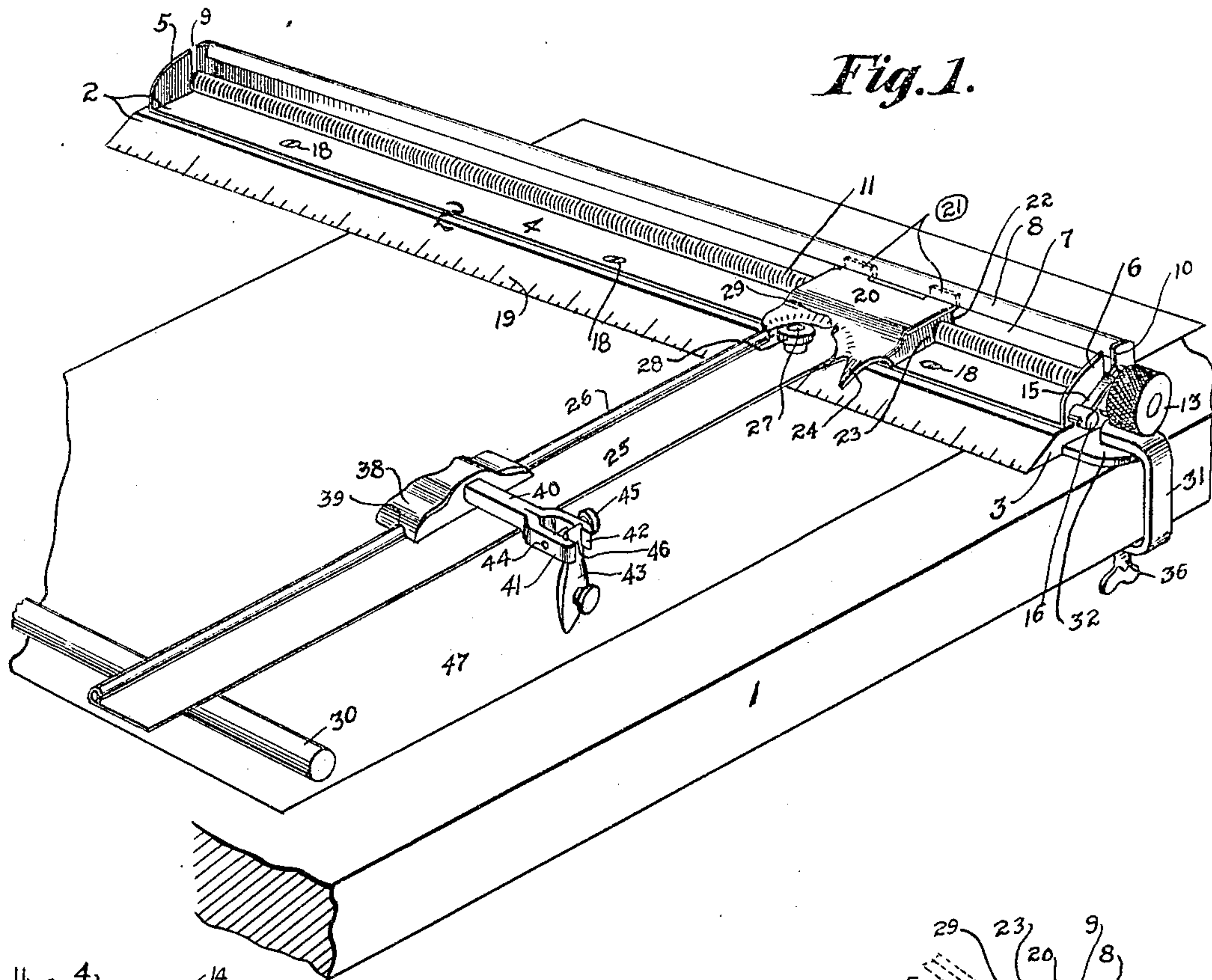


Fig. 1.

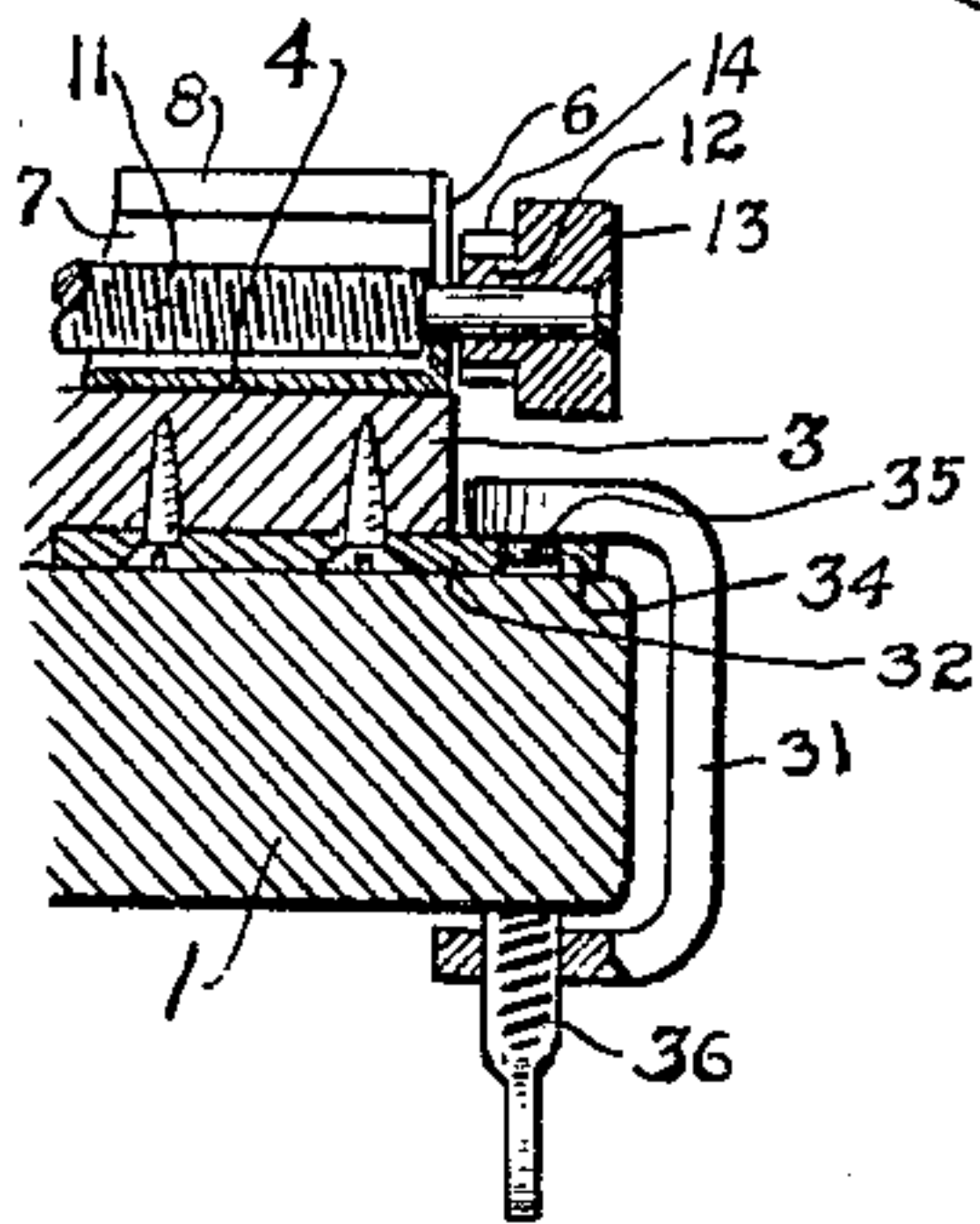


Fig. 4.

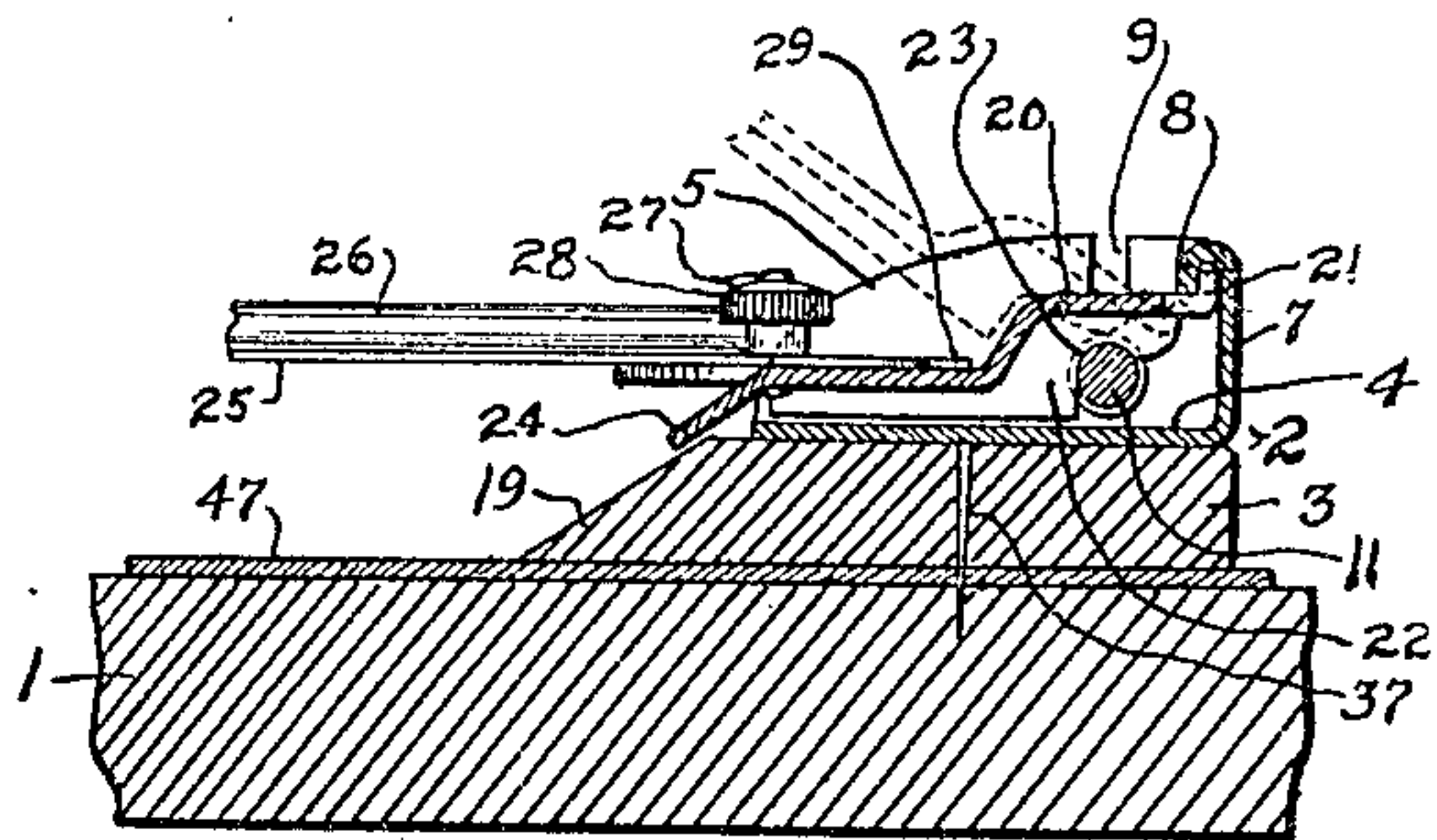


Fig. 2.

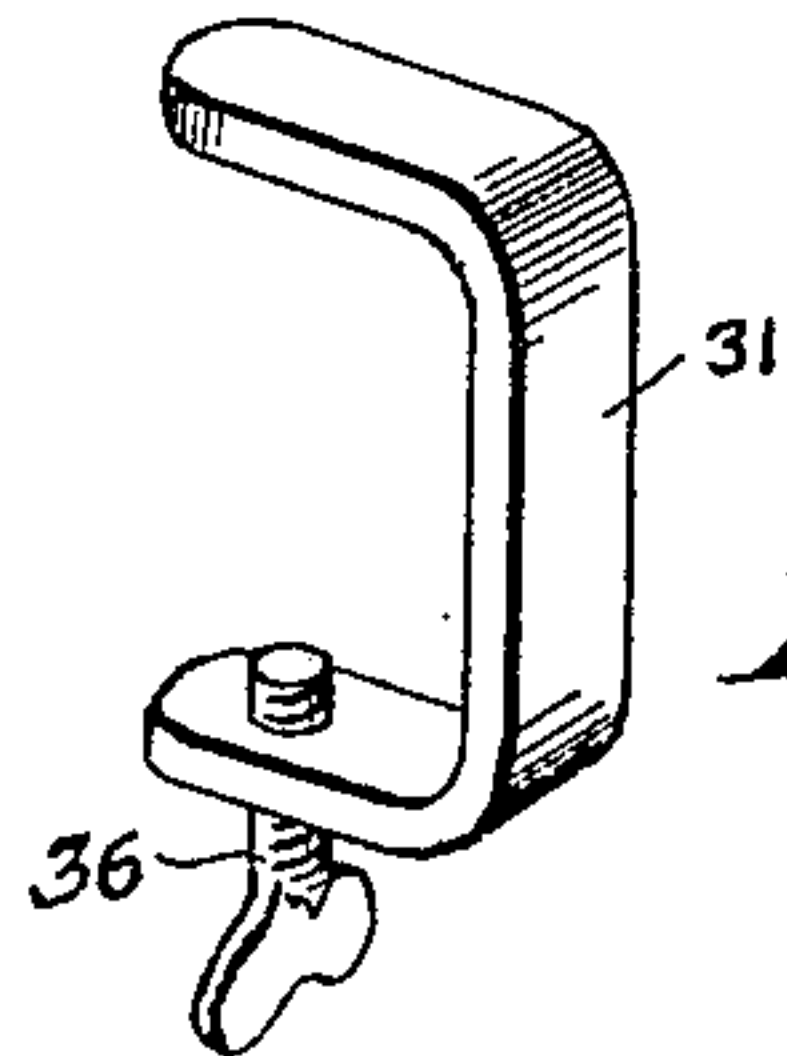


Fig. 3.

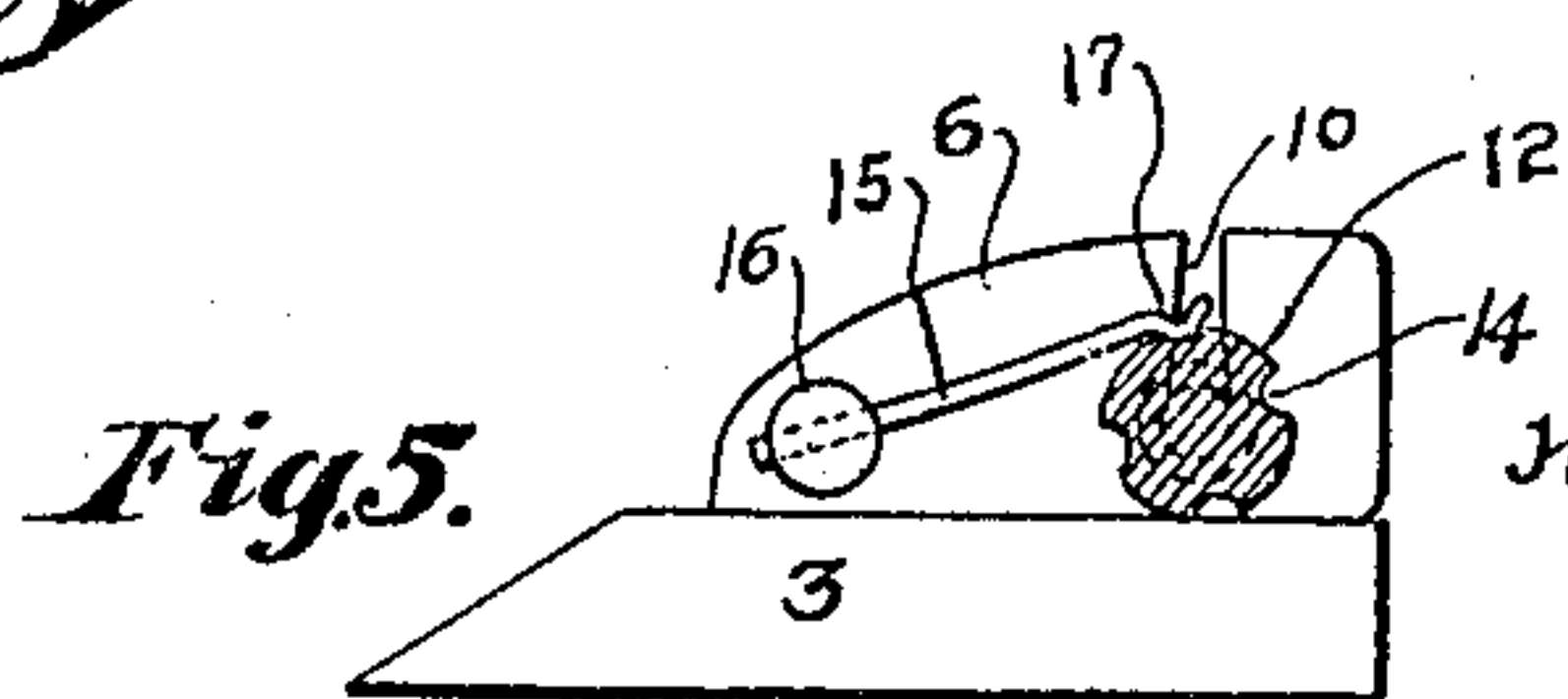


Fig. 5.

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HENRY S. NUNAMAKER, OF CLEVELAND, OHIO.

DRAFTING AND ENGRAVING MACHINE.

943,886.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY S. NUNAMAKER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Drafting and Engraving Machine, of which the following is a specification.

My invention relates to improvements in devices for producing accurate work in drafting and engraving and has special reference to a simplified form of said devices wherein an adjustable ruler is used in connection with certain guides, supports and actuating mechanism, as will hereinafter more fully appear.

The objects of my improvement are to provide a device of the character mentioned simple in construction and cheaply made, while at the same time being capable of producing accurate work and being convenient in use.

Another object is to provide a device by the use of which amateurs may do practically as perfect work as a skilled operator.

Still another object is to provide a device which will aid in the teaching of drawing and engraving by correspondence.

I attain these objects, together with other objects readily apparent to those skilled in the art, by the construction illustrated in the accompanying drawing, in which,—

Figure 1 is a perspective view of the device properly arranged upon a drafting board. Fig. 2 is a cross section of the drafting board, guide and scale, and showing the method of connection between the ruler support and said guide and scale. Fig. 3 illustrates one of the clamps used for fastening the device to the drafting board. Fig. 4 illustrates in section a portion of the drafting board, guide and scale and the clamp, illustrating the method of clamping to the drafting board. Fig. 5 is an end view of the guide and scale illustrating the arrangement of the ratchet wheel and spring in proper position.

The drafting board 1 may be of the usual construction and forms no part of the present invention. The guide and scale 2 consists of the bar 3, preferably formed of wood and made with accuracy in its several dimensions and preferably with straight sides and edges. Attached to the bar 3 is a guide, 4, which consists of a piece of sheet metal provided with the end flanges 5 and 6 and

with the side flange 7, which in turn is provided with the integral flange 8 spaced from said flange 7, as shown in Fig. 2. The guide 4, together with all of its parts should be formed with great accuracy, and especially the flanges 7 and 8 should be formed perfectly straight and with a uniform space between said flanges for their entire length. In the flanges 5 and 6 are arranged the slots 9 and 10, or their equivalents, the same being provided with appropriate bearings within which the screw threaded rod 11 may be journaled. The said rod is formed true and straight and uniformly cut threads extend from end to end thereof intermediate the bearings in the flanges 5 and 6. The rod 11 extends beyond the flange 6 and is provided with a ratchet wheel 12 and a thumb piece 13, both the ratchet wheel 12 and the thumb piece 13 being fixedly attached to the screw rod. The ratchet wheel 12 is provided with any desired number of equi-distant notches, 14, as illustrated in Fig. 5. The spring 15 is fixedly attached at one end to the flange 6 at the point 16, and is provided at the other end with a rounded portion 17 adapted to engage the various notches on the ratchet wheel.

It will be understood that the thumb piece 13 may be grasped between the thumb and finger and that by turning said thumb piece the rod 11 may be rotated, causing the ratchet wheel 12 to rotate and bringing the notches thereon into engagement with the spring 15. When the spring so engages one of said notches it will hold said ratchet wheel and the rod 11 against rotation in either direction until sufficient force is applied to the thumb piece to overcome the action of the spring.

The guide 4 is attached to the bar 3 by means of the screws 18 or their equivalents, care being taken in attaching said guide to said bar in a true and accurate manner. The bar 3 is preferably of the form shown in cross section in Fig. 2, and upon the beveled edge thereof is arranged a suitable scale, such as illustrated at 19.

The ruler support 20 is preferably of the form illustrated in the drawing, and consists of a single piece of metal provided with the flange-engaging portions 21 and with the screw rod engaging flanges 22. These screw rod engaging flanges are provided with notches as shown at 23 for the reception of the screw rod 11, and the edges

of the said flanges which bear upon the screw rod 11 are provided with threads corresponding to the threads on the said screw rod. Formed integrally with the ruler support 20 is the index 24 adapted to be used in connection with the scale 19 to determine the amount of movement imparted to the ruler support by the rod 11.

The ruler 25 is preferably formed of sheet metal and is provided with the roll 26 upon one of its edges, said roll being preferably formed wholly above the plane of the underside of said ruler and care being taken to have said roll perfectly straight and true. The ruler 25 is pivotally connected to the ruler support 20 by means of the screw 27 provided with the thumb nut 28. The index 29, formed integrally with the ruler 25 is adapted to move in an arc about the point of pivotal attachment between the ruler 25 and the ruler support 20 and a protractor scale may be arranged upon the ruler support 20 as illustrated in Fig. 1, over which the index 29 may travel and by means of which the ruler 25 may be conveniently arranged at any desired angle with the ruler support 20. The thumb nut 28 should usually be drawn up sufficiently tight to produce a practically rigid connection between the support 20 and the ruler 25. To aid in the support of the ruler 25 a suitable rod or ruler 30 may be employed, the said rod being merely laid upon the drafting board and the end of the ruler 25 rested upon it. The ruler 25 and the ruler support 20 being rigidly connected together as above described, it will be understood that when the flange engaging portions 21 are arranged between the flanges 7 and 8 of the guide 4 and the screw rod engaging flanges 22 are brought to bear upon the screw threaded rod 11 the ruler 25 will be supported in a horizontal position as shown in Fig. 2 without the necessity of an additional support 30 as shown in Fig. 1, although in practical use it may be found desirable to use said additional supporting rod. The weight of the ruler 25 and its immediately connected parts being brought to bear in a downward direction upon the screw threaded rod 11, it will be understood that the threads on the flanges 22 will be held in close engagement with the rod 11 and that if the flanges 22 are worn to any degree by reason of long use, the threads on the said flanges will be none the less sharp and perfect because of the fact that the bearing down of the said flanges upon the said rod keeps the various mutually engaging threads on the flanges and rod in perfect contact with each other and all parts of said threads will wear together. In the interaction of the guide 4, the rod 11 and the ruler 25 and its support 20, it will be noted that the rod 11 acts as a fulcrum and that the flange engaging por-

tions 21 will be forced into the space between the flanges 7 and 8 in such way as to hold them rigidly in place between said flanges while permitting a longitudinal sliding movement of said portions within the space between said flanges. It will thus be understood that the ruler 25 may be arranged at the desired angle with the ruler support 20 and the thumb nut 28 drawn up on the screw 27, thus clamping the ruler and ruler support against relative movement. The thumb piece 13 may then be turned, moving the ruler support 20 along the guide 4 and carrying the ruler 25 with it.

For the purpose of holding the bar 3 in place upon the drafting board the clamp 31 may be employed. The bar 3 is provided upon its underside with a clamping strip 32 extending beyond the end of the bar 3 and provided with an aperture 34 as illustrated in Fig. 4. The clamp 31 is provided with a lug 35 adapted to enter the aperture 34 and also is provided with the usual screw 36 by means of which the clamp may be fastened to the drafting board. The clamp may then be slightly loosened by unscrewing the screw 36 and the bar 3 may be adjusted for various angles about the lug 35 as about a pivotal point. When the desired position has been reached the screw 36 may be drawn up and the clamping strip 32 thus held so tightly against the drafting board as to prevent further relative movement between the bar 3 and the said board.

In cases where it is desired to use the device without the clamp 31 the form of fastening illustrated in Fig. 2 may be employed. In this construction the pin 37 is fastened in the body of the bar 3 and projects beyond the surface of said bar 3 adapted to lie upon the drafting board. The projecting portion of said pin 37 is pointed and adapted to be pressed into the drawing board as illustrated in Fig. 2, thus holding the bar 3 in place. It will be understood that this method of fastening is not the preferable form of the invention but is a modification for use in cases where the clamp 31 is undesirable.

The instrument guide 38 is preferably formed of wood and is provided with a rounded groove 39 adapted to engage the roll 26 upon the ruler 25 and to slide longitudinally on said roll without side movement. Fixedly attached to the instrument guide 38 is the pen yoke 40, which is provided with the two spaced portions 41 and 42 between which the pen or other instrument 43 is adapted to be clamped by means of the screw 44 extending between said portions and provided with the head 45. The instrument 43, whether it be a pen or engraving instrument, should be provided with a head 46 adapted to be clamped between the spaced portions 41 and 42. The

particular form of instrument used forms no part of the present invention, as the said invention may be used with various instruments for contact with the paper or other material upon which drafting or engraving is to be done. In the drawings the instrument represented is a drawing pen and the drawing board 1 is shown as having a sheet of drawing paper, 47, arranged thereon for the purpose of drafting. It will be understood that the instrument guide 38 may be readily lifted from the bead 26 for the purpose of filling the pen or for other purposes if desired. When, however, it is again replaced upon the bead 26 and the point of the instrument permitted to engage the surface of the work, the said point will be brought to exactly the same location with reference to the ruler 25 as it had previously assumed.

It should be noted that the device may be used without the instrument guide, instrument yoke and instrument as shown in Fig. 1, as these parts may be laid aside and an ordinary pen or other instrument used along the edge of the ruler 25. In shading drawings and in the work of engraving, however, it is necessary that the pen or instrument of ordinary construction if used be held at exactly the same angle with reference to the ruler 25 for each stroke or line. If the angle at which said pen or instrument is held varies, a slight variation in the distance between the lines will be noticeable. This is particularly true in cases where the work is to be done by inexperienced persons, as the variation of the angles at which the said pen or instrument is held increases with the lack of skill of the operator. By means of the instrument guide, yoke and instrument above described and shown in the drawings, such variation in the angle of holding the pen is avoided and thus great accuracy is possible.

When it is desired to remove the ruler and ruler support from the guide and scale it is only necessary to lift the free end of said ruler into an upward position, throwing the ruler support 20 into the position shown in dotted lines in Fig. 2, thus releasing the flange engaging portions 21 from the flanges 7 and 8 and freeing the ruler support from said flanges and from the rod 11.

In the operation of the device, after one line of shading or engraving has been made, the thumb piece 13 may be rotated until one of the notches 14 comes into contact with the spring 15 moving the ruler support 20 along the guide and scale. The ruler 25 will then assume a position parallel to the line just made, and another line may be drawn or engraved which will be perfectly parallel to the said first line. By providing the rod 11 with screw threads of fine measurement it will be possible to make quite a variation in the distance between the en-

graved and drawn lines as the ratchet wheel 12 may be turned only the distance between two adjacent notches or farther as desired in order to arrange all of the lines at uniform distances from each other.

I claim—

1. The herein described drafting and engraving machine comprising a guide and scale, said guide and scale provided with a way arranged longitudinally thereon, a ruler support provided with portions adapted to be located in said way and to slide longitudinally therein, means for sliding said ruler support with reference to said guide and scale, a ruler adjustably connected to said ruler support, means for holding said ruler in fixed adjustment with reference to said ruler support, an instrument guide adapted to engage said ruler and to slide longitudinally thereon, a pen yoke fixedly attached to said instrument guide, said pen yoke provided with spaced portions adapted to be adjusted with reference to each other and to clamp an instrument between them and means for adjusting said portions with reference to each other.

2. The herein described drafting and engraving machine comprising a guide and scale, said guide and scale provided with a way arranged longitudinally thereon, a ruler support provided with portions adapted to be located in said way and to slide longitudinally therein, means for sliding said ruler support with reference to said guide and scale, a ruler connected to said ruler support, an instrument guide adapted to engage said ruler and to slide longitudinally thereon, a pen yoke fixedly attached to said instrument guide, said pen yoke provided with spaced portions adapted to be adjusted with reference to each other and to clamp an instrument between them, and means for adjusting said portions with reference to each other.

3. The herein described drafting and engraving machine comprising a guide and scale consisting of a bar and a guide formed of sheet metal attached to said bar, said guide provided with end flanges and with a side flange, said side flange provided with an integral flange spaced from said side flange, a screw threaded rod journaled in said end flanges, a ratchet wheel and thumb piece fixedly attached to said screw threaded rod at one end thereof, said ratchet wheel provided with notches, a spring fixedly attached to one of the end flanges and adapted for engagement with the said ratchet wheel, a ruler support formed of a single piece of metal and provided with flange engaging portions adapted to be located between the said side flange and the spaced integral flange of said guide and with screw rod engaging flanges, said rod engaging flanges adapted to bear upon said screw rod and

provided with screw threads adapted to engage the screw threads on the said screw rod, said bar provided with a graduated scale said ruler support provided with an index adapted to move along said graduated scale, a ruler pivotally connected to said ruler support and adjustable with reference thereto said ruler support provided with a protractor scale, said ruler provided with an index adapted to move over said protractor scale when said ruler is moved upon its pivotal connection, means for holding said ruler in fixed pivotal adjustment with reference to said ruler support, said ruler provided with a roll, an instrument guide provided with a groove adapted to engage said roll and to slide longitudinally thereon, a pen yoke fixedly attached to said instrument guide and said pen yoke provided with means for attachment to an instrument for drawing or engraving.

4. In a drafting and engraving machine, a guide provided with a way, a screw rod

mounted upon said guide and arranged parallel with said way, a ruler support provided with portions adapted to be located in said way and to slide longitudinally therein, said support also provided with screw rod engaging flanges provided with screw threads adapted to engage the screw threads on the said screw rod, a ruler attached to said ruler support, said guide arranged upon a bar for elevating it above the surface of a drafting board, said screw rod arranged at a point between said way and the said ruler supported by the said ruler support, whereby the weight of said ruler will press said ruler support against said screw rod.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

HENRY S. NUNAMAKER.

Witnesses:

FRANKLIN JONES,
H. J. PHELPS.