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DEPICTING DEVICE

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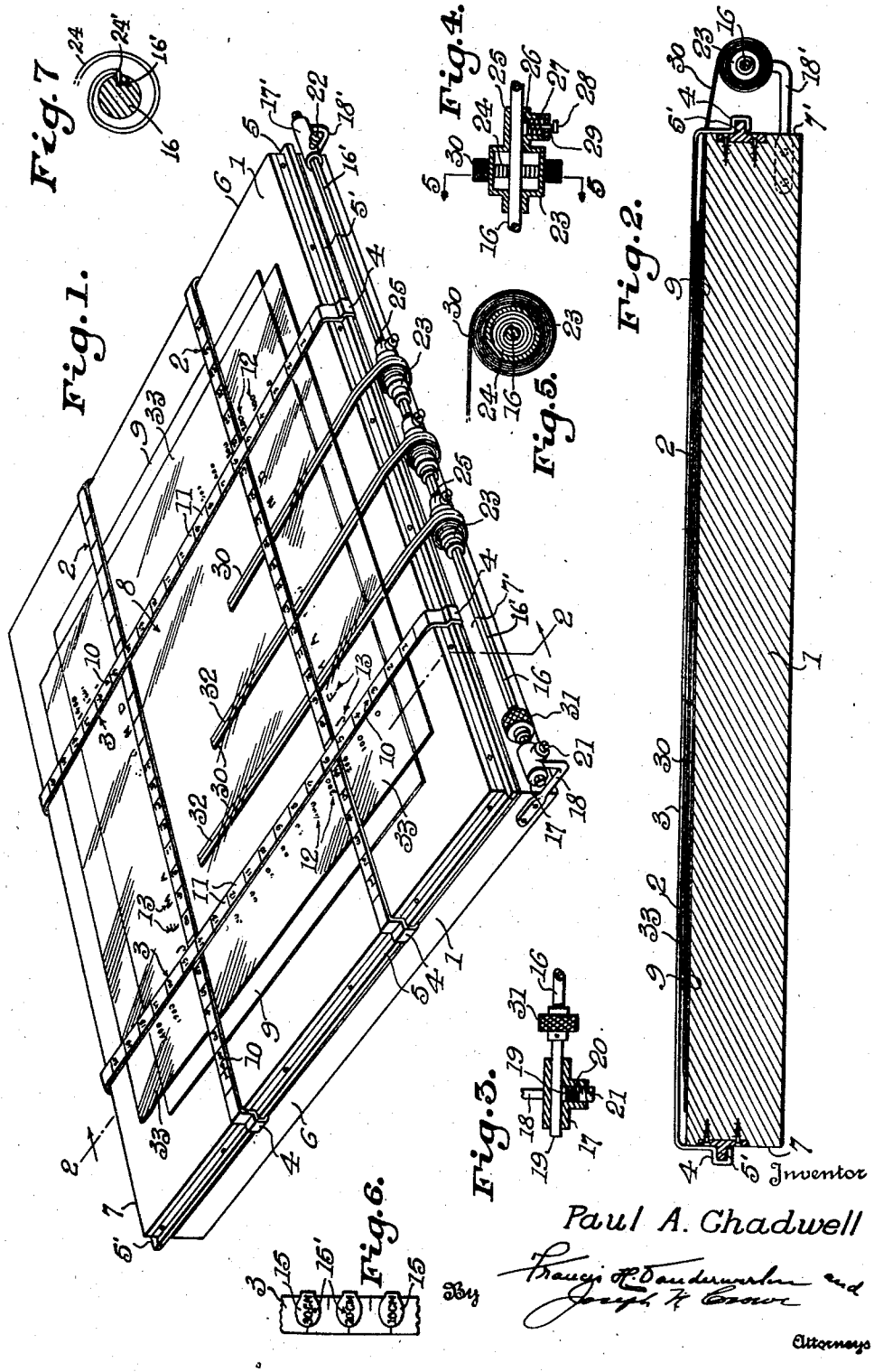


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7

Inventor

Paul A. Chadwell

By Francis H. Vandenburgh and Joseph H. Conner

Attorneys

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DEPICTING DEVICE

Paul A. Chadwell, Washington, D. C.

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6 Claims. (Cl. 35—24)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without payment to me of any royalty thereon.

This invention relates to a graph depicting device, more particularly it is directed to a device of this character, designated a "Graphomat" and including a supporting member having mechanical means operable thereon for describing a graph on a sheet of writing material.

One of the objects of the invention is to provide a graph depicting device adapted to facilitate graphic presentation in several ways with the minimum of time and effort.

Another object of the invention is to provide a graph depicting device including separate strips of different lengths placed adjacent to each other on a sheet of writing material mounted on a supporting member, the positions of the strips representing certain factors in a set of conditions and the lengths or heights of the strips representing or indicating other factors.

Another object of the invention is to provide a graph depicting device including a bar-frame variably adjustably mounted on a supporting member to demarcate any area of a depicted graph on a sheet of writing material for photostatic purposes.

With the above and other objects and advantages in view the various features of novelty, whereby the invention is characterized, will hereinafter be pointed out with particularity in the claims; but for a full understanding of the invention reference may be had to the following detailed description taken in connection with the accompanying drawing wherein:

Figure 1 is a perspective view of a graph depicting device embodying the invention;

Figure 2 is a cross-sectional view thereof taken on line 2—2 of Figure 1;

Figure 3 is a fragmentary detail sectional view of one end of a bracket having a shaft used in carrying out the invention rotatably mounted thereon, with means for frictionally holding the shaft in a non-rotative position provided on the bracket;

Figure 4 is a fragmentary detail sectional view of a hollow spool rotatably mounted on the shaft, and having a strip wrapped thereon, with a spring in the spool and means for frictionally holding the spool in a non-rotative position on the shaft;

Figure 5 is a cross-sectional view taken on line 5—5 of Figure 4;

Figure 6 is an enlarged fragmentary detail top plan view of tabs mounted on a strip and containing suitable indicia used in carrying out the invention; and

Figure 7 is an enlarged view of the center portion of Figure 5, showing a method of attaching the spring to the shaft.

Referring more specifically to Figs. 1 and 2 of the drawing, 1 designates a supporting member of any desired size and of any desired material such as hard rubber or lumber. The supporting member 1 which is rectangular in shape is preferably in the form of a drawing board having a pair of horizontally extending parallel frame members or bars 2 and a pair of vertically extending parallel frame members or bars 3 adjustably mounted thereon, with the pair of vertically extending frame members 3 overlying the pair of horizontally extending frame members 2. The ends of the pairs of horizontally and vertically extending frame members 2 and 3, respectively, are suitably bent to provide rail engaging portions 4 thereon, which rail engaging end portions 4 of the frame members slidably engage pairs of rails 5 and 5' suitably mounted around the vertically extending edges 6 and horizontally extending or upper and lower edges 7 and 7', respectively, of the supporting member 1. The pair of vertically extending rails 5 have the pair of horizontally extending frame members 2 slidably mounted thereon and the pair of horizontally extending rails 5' have the pair of vertically extending frame members 3 slidably mounted thereon.

The pairs of frame members 2 and 3 may be made of any suitable rigid material such as metal, wood, and plastic, preferably black finished, and are adjustable with respect to each other on the supporting member 1 so as to provide a variable frame 8 which may be enlarged or reduced to any suitable size to encompass a portion of a sheet of writing material 9 mounted on the supporting member 1 under the frame members 2 and 3. The sheet of writing material 9 is provided for having a graph depicted thereon, with the frame 8 formed by the frame members 2 and 3 demarcating the area of the graph. These frame members 2 and 3 may be moved on the rails 5 and 5' to the extremities of or removed from the supporting member 1 to facilitate working on a graph to be produced on the sheet of writing material 9 and in order to determine the amount of adjustment of the frame members 2 and 3 on the supporting member 1 necessary to demarcate a certain size graph on the sheet of writing material 9, the frame members are each provided with a scale 10 which in the present instance is graduated in inches 11, but may be graduated in centimeters if desired as shown in Fig. 6. The sheet of writing material 9 has vertically arranged members 12 provided thereon running from 0 and upward to 1400 and registering with the inch graduation 11 on the vertically extending frame members 3, and horizontally arranged indicating characters 13 representing

any values such as the months of a year as illustrated in Fig. 1. In order to provide different scales on the frames 2 and 3, small tabs 15 having numerals 15' thereon designating centimeters as shown in Fig. 6 may be removably mounted in any suitable manner on the inch graduations 11 of scales 10 of the frame members 2 and 3. These various graduations or markings referred to above are simply illustrations and are not intended in any way to limit the extent and kinds of marking or indications that may be provided.

The supporting member 1 is provided with a horizontally extending shaft 16, the ends of which shaft 16 are rotatably mounted in bearing portions 17 and 17' of brackets 18 and 18', respectively, said brackets 18 and 18' being suitably mounted on the supporting member 1 and extending outwardly beyond the lower edge 7' thereof. The shaft 16 is frictionally held in a non-rotative position on bracket 18 by means of a shoe 19 mounted in the bearing portion 17 of bracket 18, which shoe 19 is pressed into frictional contact with one end of the shaft 16 by means of an expansion spring 20, with an adjusting screw 21 threadedly mounted on the bearing portion 17 and engaging the spring 20 as illustrated in detail in Fig. 3. A lock pin 22 is mounted on the bearing portion 17' of the bracket 18' and is adapted to be actuated into contact with the other end of the shaft 16 for holding it in a non-rotative position on the bracket 18'.

The shaft 16 has a plurality of suitably spaced hollow spools 23 rotatably mounted thereon, with a spring 24 enclosed in each of the spools. The spools 23 may be moved in any suitably spaced relation on the shaft 16. The springs 24 are in the form of steel tapes loosely wrapped around the shaft 16, with one of the ends of the springs 24 forming inwardly extending flanges 24 adapted to engage the longitudinal groove 16' provided in the shaft 16 and having their other ends attached at the spools 23 as shown in detail in Fig. 5 and Fig. 7. Each of the spools 23 is provided with a bearing end portion 25 having a shoe 26 mounted therein, with the shoe 26 held in frictional contact with the shaft 16 by a spring 27. The shoe 26 may be pulled out of frictional contact with the shaft 16 by means of a button member 28 including a stem 29 secured at its inner end to the shoe 26 as illustrated in Fig. 4, whereby friction holding means are provided on each of the spools 23 for a purpose which will hereinafter appear. Removable means may be provided for holding the shoe 26 out of frictional contact with the shaft 16, for instance a semicircular washer may be positioned around the stem 29 intermediate the button member 28 and the bearing end portion 25 when the shoe 26 and shaft 16 are in a non-engaging relationship.

Wrapped around each of the spools 23 is a strip or tape 30 of any suitable material such as Cellophane, which material should be opaque in order that the strips or tapes 30 may be reproduced photostatically. One of the ends of the strips 30 is suitably attached to the spools 23 and the other ends of the strips are left free for a purpose which will hereinafter appear. The strips 30 are normally retracted on the spools 23 but for the purpose of illustration different lengths of the strips are shown as being in an extended condition on the sheet of writing material 9, with the positions of the different lengths of the strips on the sheet of writing material 9 representing certain factors in a set of conditions and the numbers 12 on the sheet of writing material 9 interpreting the indications afforded by said strips. The strips are drawn out to different extended positions on the sheet of writing material 9 by grasping the free ends thereof, with the spools 23 released from their non-rotative condition on the shaft 16.

In doing this, the spools 23 are rotated in a direction to wind the springs 24 in the spools, thus storing sufficient energy to rewind the strips 30 on the spools when the latter are again released from their non-rotative condition on the shaft 16 by means of the button member 28. Once the relative lengths or heights of the strips 30 on the sheet of writing material 9 have been determined in representing certain factors in a set of conditions, the strips may be simultaneously adjusted either upwardly or downwardly on the sheet of writing material 9 by rotating the shaft 16 with the finger wheel 31. The strips 30 are scored lightly at 32 the full length thereof so as to facilitate the centering of the strips. A piece of any suitable transparent material 33 such as pliofilm is attached to the upper end of supporting member 1 in any suitable manner, with the piece of transparent material 33 being folded or laid over the strips on the sheet of writing material 9 to hold the strips in place upon a depicted graph being photostated.

In practice it has been found that to depict any particular statistical sequence not more than three wide strips are necessary. As the size of the frame 8 is infinitely adjustable, it has proved more practical to change its size rather than provide additional spools 23 having additional widths of strips thereon. In other words, it is more feasible to extend or contract the length of the base to fit the given widths of the strips rather than to provide new strips to fit any predetermined magnitude of scale.

As it is very difficult to gain an idea of the layout of a graph without first making several sketches of it, the device has been designed so that one may immediately visualize the overall dimensions and scales of a graph by adjusting the movable components comprising the invention and the device is particularly adapted to the making of bar-graphs and these may be set up by utilizing the strips 30. Although the device is depicted for determining the dimensions of linear graphs, it also may be utilized in laying out mechanical and other drawings. It is found to be particularly convenient to photostat the graphs, which have been set up by the various elements of the device, with the variable frame 8 provided by the frame members 2 and 3 demarcating the area of the graph.

In operation, the sheet of writing material 9 is provided with any suitable numbers or letters representing any values such as the numbers indicated at 12 and the indications 13 of the months of the year as illustrated. The sheet of writing material 9 is then placed on the supporting member 1 and the free ends of the strips 30 are grasped and drawn upwardly various distances onto the sheet of writing material with the upper ends of strips being coordinate with the selected indications 12, which indications 12 may represent time, value, size, volume, space or other things. The values to be compared with the indications 12 are represented by the horizontally extending indications 13 on the sheet of writing material 9, which in this case represent the months of a year but could be made to repre-

sent any values. The piece of transparent material **33** is then placed over the strips **30** on the sheet of writing material **9** and the frame members **2** and **3** are then variably adjusted on the supporting member **1** over the piece of transparent material **33** until the frame **8** demarcates the area of the particular size graph to be produced after which the graph is ready to be reproduced photostatically. The scales **10** on the frame members **2** and **3** facilitate the determination of the necessary amount of adjustment of the frame members **2** and **3** to cause the frame **8** to demarcate a particular size depicted graph. The frame members **2** and **3** and strips **30** are made of suitable opaque material so that an outline thereof is produced on the photostated graphs.

It will thus be seen that there is herein provided a simple, novel and rugged construction which when the indicating or graph-forming elements are retracted has the appearance of a simple drawing board or slab and which device is extremely simple in operation and that by simply changing the graduations, legends, numbers or other indicating matter on the sheet of writing material any graph may be duplicated on the improved device.

Even though there has herein been shown and described a graph producing device as comprising certain features of construction and operation of parts, it is nevertheless to be understood that various changes may be made therein, if the changes do not depart from the spirit or scope of the claims.

Having thus described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A device of the class described comprising a member having a plane surface adapted to support a sheet of material thereon, side members supporting said plane surface, rail members longitudinally disposed on the outer surface of said side members, frame members slidably engaging parallel pairs of said rail members and adapted to slide over said plane surface demarcating any desired rectangular area thereof, spaced indicia on said frame members representing graphic coordinates, a longitudinally grooved shaft positioned longitudinally along and in spaced relation with a side member, frictional means normally holding said shaft in a non-rotative condition but permitting rotation thereof by force, hollow spools mounted on said shaft, means selectively positioning said spools in rotative and non-rotative conditions on said shaft, a spiral spring incased in each spool and attached at one end to said spool and having the other end thereof flanged to engage the longitudinally grooved shaft, and a strip of tape wound around said spool and attached at one end to said spool.

2. A device of the class described comprising a member having a plane surface adapted to support a sheet of material thereon, side members supporting said plane surface, a longitudinally grooved shaft positioned longitudinally along and in spaced relation with a side member, frictional means normally holding said shaft in a non-rotative condition but permitting rotation thereof by force, hollow spools mounted on said shaft, means selectively positioning said spools in rotative and fixed positions on said shaft, a spiral spring incased in each spool and having one end attached to said spool and the other end flanged to engage the longitudinally grooved shaft, a roll of tape positioned on said spool and having the inner end thereof secured to said spool whereby said tape can be unrolled to any desired length and extended across said plane surface, a sheet of transparent material positioned over said extended tape portion, and an adjustable frame including rail members longitudinally disposed along the side members, and bars slidably engaging parallel pairs of said rail members and adapted to slide over said plane surface and said transparent material imposed thereover demarcating any desired area thereof.

3. A device of the class described comprising a member having a rectangular plane surface adapted to support a sheet of material thereon, downwardly extending members supporting said plane surface, rail members mounted on said supporting members parallel to the edges of said plane surface, frame members slidably engaging parallel pairs of said rail members and adapted to be extended over and in contact with said plane surface demarcating any desired rectangular area thereof, spaced indicia on said frame members representing graphic coordinates, a longitudinally grooved shaft supported by said supporting members and in parallel spaced relation with one edge of said plane surface, frictional means normally holding said shaft in a non-rotative condition but permitting rotation thereof by force, hollow spools positioned on said shaft and movable thereon, means selectively positioning said spools in rotative and non-rotative conditions on said shaft, tape wound around each of said spools and having one end attached thereto, and means associated with each of said spools for rewinding the tape thereon after same has been unrolled therefrom.

4. A device of the class described comprising a member having a plane surface adapted to support sheet material thereon, supporting members for said plane surface, frame members movably supported by said supporting members and adapted to demarcate an area of said plane surface, indicia representing graphic coordinates positioned on said frame members, a shaft, spools mounted on said shaft, a roll of tape mounted on each spool, means supporting said shaft parallel to and in spaced relation with one edge of said plane surface.

5. A device of the class described comprising a base member having a plane surface thereof adapted to support sheet material thereon, rail members secured to said base, frame members slidably engaging opposed rail members, spools supported in spaced relation with said base and movable parallel to one edge of said plane surface, tape wound around each of said spools and having one end secured thereto, spring means for rewinding said tape on each of said spools after the tape has been unrolled.

6. A device of the class described comprising a support having a plane surface adapted to have positioned thereon sheet material, spools supported in spaced relation with the support and adjacent to one edge of the plane surface thereof, strips wound on said spools and having free ends thereof adapted to be extended over said support in contact with sheet material positioned thereon, a variable frame adjustably mounted on said support and adapted to be actuated over the plane surface thereof demarcating an area thereof, and indicia representing graphic coordinates carried by said variable frame.

PAUL A. CHADWELL.