

Nov. 15, 1949

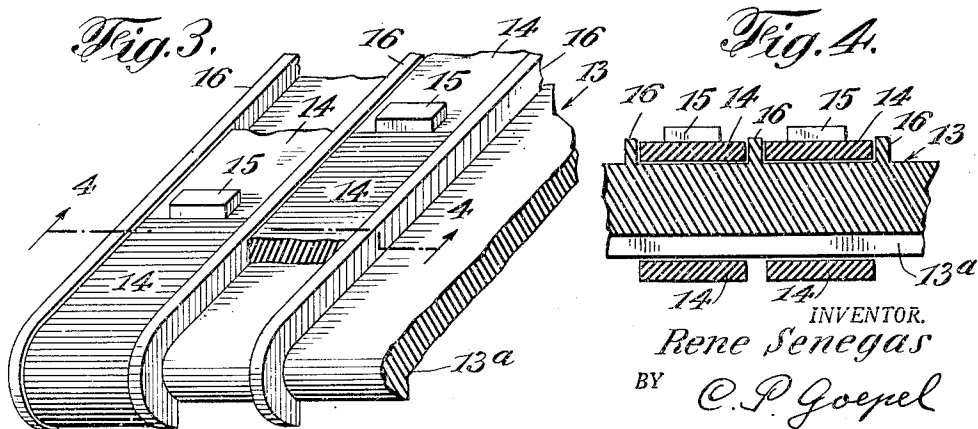
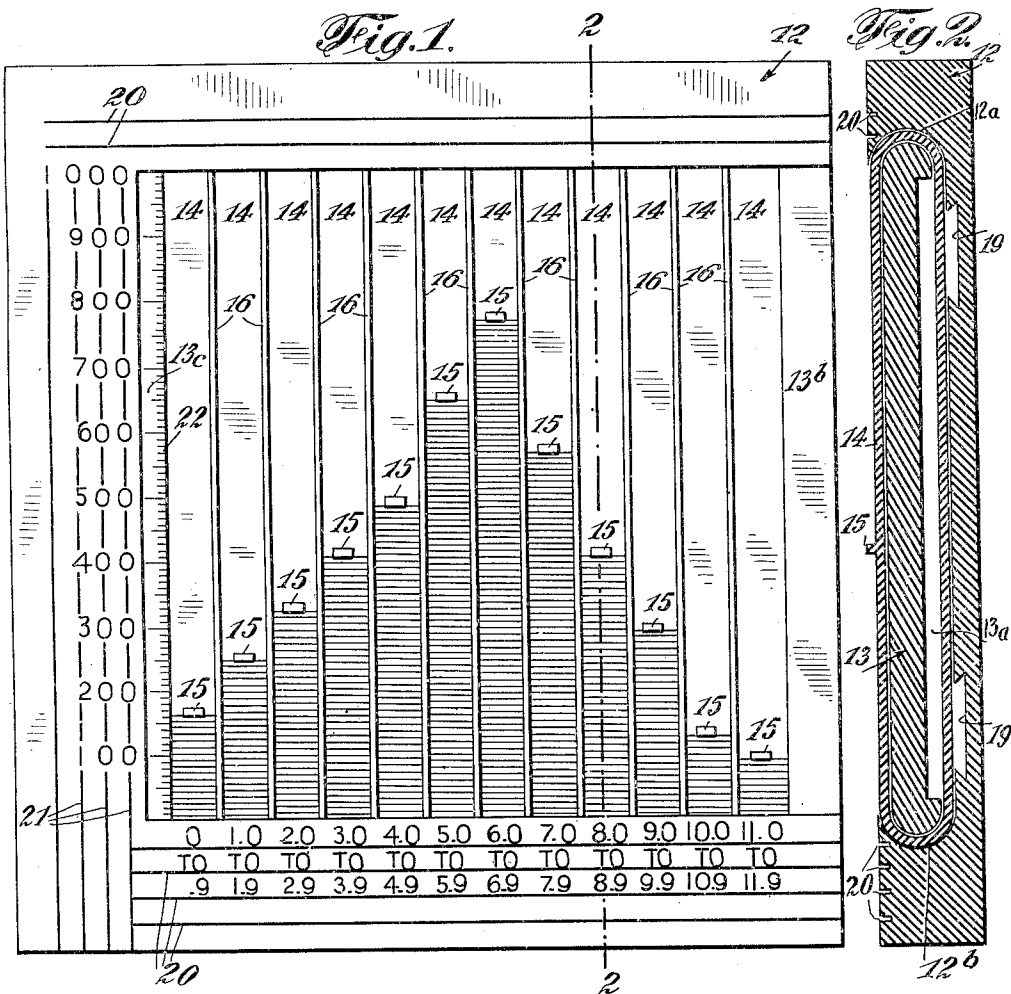
R. SENEGAS

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INSTRUMENT FOR THE PRESENTATION OF QUANTITATIVE
DATA IN VISUAL GRAPHIC FORM

Filed Feb. 6, 1946

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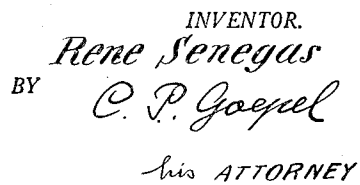


INVENTOR.
Rene Senegas
BY C. P. Goepel

his ATTORNEY

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UNITED STATES PATENT OFFICE

2,488,338

INSTRUMENT FOR THE PRESENTATION OF
QUANTITATIVE DATA IN VISUAL GRAPHIC
FORM

Rene Senegas, New York, N. Y.

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2 Claims. (Cl. 116—135)

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This invention relates to an instrument for the presentation of quantitative data in visual graphic form.

One object of the invention is to provide a device of such universal application that it serves the variable needs of students, educators, psychologists, sociologists, economists, statisticians, research technicians, business men, journalists, draftsmen, engineers, and many other professional workers.

Another object of the invention is to provide a simple, easily operated device with a minimum of movable parts which saves much time, effort and expense in the visual representation of statistical tables and similar numerical data. The actual labor of assembling the movable parts may be delegated to untrained, unskilled assistants, resulting in highly economical division of labor.

Another object of the invention is to provide for rapid, easy interchangeability of the indicating members to permit an infinite number of combinations of effects composed of bars divided into areas of different solid colors, different patterns such as lines, cross-hatching, stippling, and also pictorial isotype symbols representing different objects.

Another object of the invention is to provide a mechanical device for representing graphic charts with a clean, neat appearance so that, when photographed for permanent file records or reproduction in printed matter, they resemble typical hand-drawn graphs without irrelevant, extraneous mechanism. By saving time and expense, publishers could include many more accurate charts than might be possible if each original had to be drawn by hand.

The invention consists of a removable core in a frame, on which core belts are arranged to be moved to indicate a graph. The belts are elastic to be readily applied to the core and to be removed therefrom to permit substitution of other belts. The belts may be colored or otherwise marked. Preferably, the core has guide portions registering with guideways in the frame, and projections to register with grooves in the frame. Preferably the core has tracks formed by partitions between which partitions the belts are movable.

The invention will be further described, embodiments thereof shown in the drawings, and the invention will be finally pointed out in the claims.

In the accompanying drawings,

Fig. 1 is a front elevation of the improved instrument embodying the invention;

Fig. 2 is a section taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary perspective view of the movable portions of the instrument as seen when removed from the outer frame;

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Fig. 4 is a fragmentary section taken along the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the one-piece outer frame forming part of the structure shown in Fig. 1;

Fig. 6 is a perspective view of the one-piece inner core forming part of the structure shown in Fig. 1;

Fig. 7 is a perspective view of the endless belts which fit over and engird the inner core shown in Fig. 6;

Fig. 8 is a section taken along the line 8—8 of Fig. 5;

Fig. 9 is a section taken along the line 9—9 of Fig. 6;

Fig. 10 is a section taken along the line 10—10 of Fig. 6, and

Fig. 11 is a section taken along the line 11—11 of Fig. 6.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawings, and more particularly to Fig. 1, the instrument shown enables a presentation of quantitative data in visual graphic form. Belts are shown having contrasting portions, and these belts are movable each to its own position. The frame around the belts has vertically arranged references and horizontally arranged references. The belts are moved so that the color partition corresponds to the relation of the figures on the ordinate and on the abscissa. The ultimate positioning of the respective partitions of the belts indicate then the graph, as well known.

The improvement consists of providing a one-piece outer shell 12 (Fig. 5) preferably made of plastic material. This shell 12 forms a frame of three sides, the fourth side being open. The front surface of each of the three sides is provided with grooves 20, arranged horizontally and grooves 21 arranged vertically, to enable changeable references as shown in Fig. 1 to be applied in the manner well known. The vertical portion of the frame 12 is provided with a cutout formed by the vertical wall 12c and by the horizontal and parallel curved walls 12a and 12b. Disposed in this cutout and between the curved walls 12a and 12b are parallel and spaced recesses 19 of dovetail shape. (Figs. 2, 5 and 8.)

An inner core 13 (Fig. 6) consists of two end members 13c and 13b, which have upper and lower curved portions conforming in shape to the curved walls 12a and 12b of the frame 12, and substantially of the same curvature, the inner core, however, being slightly smaller to enable registration to be had, but of sufficient size as to provide a frictional hold, when the inner core is in registration with the frame. At the rear of the end portion 13b, projections 17 are provided and at the rear of the end portion 13c,

projections 18 are provided. The shape of these projections 17 and 18 correspond to the shape of the dove tail recesses 19 in the frame 12, and register therewith, provide also a frictional hold, so that when the core 13 is inserted in the frame 12, it will remain in position without further fastening devices and resist any movement which may result from the manipulation of the separate belts.

Between the end portions 13c and 13b, the core 13 is provided with fins or partitions 16 extending beyond the surface of the core and these partitions 16 extend circumferentially along the front and top and bottom curved portions of the core. They are spaced from each other a distance about equal to the width of a band 14 (Fig. 7). In Fig. 6, twelve guideways for such bands are shown, but these may be increased or decreased in number. The end portion 13c has a scale indicator 22 shown thereon. The end portions 13c and 13b are the same in vertical section as shown in Fig. 9, and a vertical section of the frame 12 is shown in Fig. 8. A vertical section of the core 13 at line 10—10 is shown in Fig. 10; and a horizontal section on line 11—11 of Fig. 6 is shown in Fig. 11.

Each band 14 is made of plastic of an elastic type, and has its front surface of two contrasting colors, the meeting parts of the contrasting colors forming a line, where a knob or handle 15 is applied. In the embodiment, each entire half of the band is colored, for which reason Fig. 7 shows the inner surface also colored. The elasticity of the band permits it to be stretched so as to be moved over, in embracing manner, the larger sized end portion 13b or 13c, and also over the partitions or fins 16, until the desired trough is reached, when the inherent elasticity of the band causes a contraction so that the band embraces the core with a slight frictional hold. The band is moved over the core by means of the manipulating handle 15. When belt 14 is released to fall into a trough or track, it is still kept slightly stretched in excess of its normal relaxed dimension, maintaining a slight degree of friction which insures against accidental, involuntary shifting of position.

When it is necessary to change belts 14 to allow replacements of different colors or patterns, the operator inserts fingers under the band 14 on the cutout side 13a of core 13 which lacks fins, and stretches the band 14 until it can be slipped off at either end. The replacing belt or band is then selected from a reserve assortment, stretched and slipped over core 13 and dropped into position in the vacant track.

With all of the guideways or shallow tracks of the core 13, filled with bands 14, as shown also in detail in Fig. 4, the core is inserted into the cutout of the frame 12, and the instrument or device is then in assembled position as shown in Fig. 1. The desired numerals or letters are then inserted in the grooves 20 and 21, and the knobs or handles 15 moved in response to any particular relation of ordinate to abscissa, and a graph produced as shown in Fig. 1.

Letters may be inserted in the groove 20 of the top portion of the frame 12 to indicate the character of the graph, and letters may be inserted in the spare groove of the vertical or horizontal to indicate the character of the ordinate or abscissa. In this manner, the essential elements of a complete graph can be assembled in

very little time: Title, Scale caption, Scale of values, Source, Bar labels. Once these reference elements are established, the operator grasps the knob 15 of each belt 14 and raises or lowers it, sliding each belt 14 around the core 13 until the desired height is indicated relative to the scale.

The core may be removed and the bands then removed therefrom, and other bands of other colors or connotation replaced, and the core then again inserted, and a differently colored graph obtained.

Although the drawings shown here indicate specific proportions and a definite number of indicator belts, it should be understood that instruments embodying the principles of my invention could be constructed with more or fewer indicators, and of varying proportions.

I have described several forms of my invention, but obviously various changes may be made in the details disclosed without departing from the spirit of the invention as set out in the following claims.

I claim:

1. In an instrument for the presentation of quantitative data in visual graphic form, the combination of a frame having a rearwall, one vertical side wall and two parallel horizontal walls projecting forwardly from the rearwall, leaving the remaining vertical side open, a core having end portions of substantially the same size as the guideways for registration therewith, and providing a frictional hold, yet permitting a positively operated movement of the core in the frame for its insertion and removal, said core having spaced partitions forming tracks intermediary said end portions, and endless belts surrounding said core and each disposed in a track on said core, said belts having an inherent elasticity to enable the same to be stretched for moving over the end portions of the core, and to provide a frictional hold on the core when in the tracks, yet permitting a positively operated movement of the belt over the core, each belt consisting of two halves of contrasting colors, and substantially one half of the belts being visible when the core is in the frame, with the contrasting colors at their abutting ends forming the indicator, graduated indications along the vertical sidewall, graduated indications along at least one of said horizontal walls, one aligned longitudinally with each of said belts, whereby when the belt enveloped core is assembled in the frame, the respective belts may be moved to indicate a graph, with the meeting points of said contrasting colors of each belt horizontally aligned with one of the indications along the vertical side wall.

2. The structure of claim 1, in which the frame and end portions of the core have registering projections and grooves at the front of the rear wall and at the rear of the end portions for guiding the movement of the core when being inserted or disengaged from the frame.

RENE SENEGAS.

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