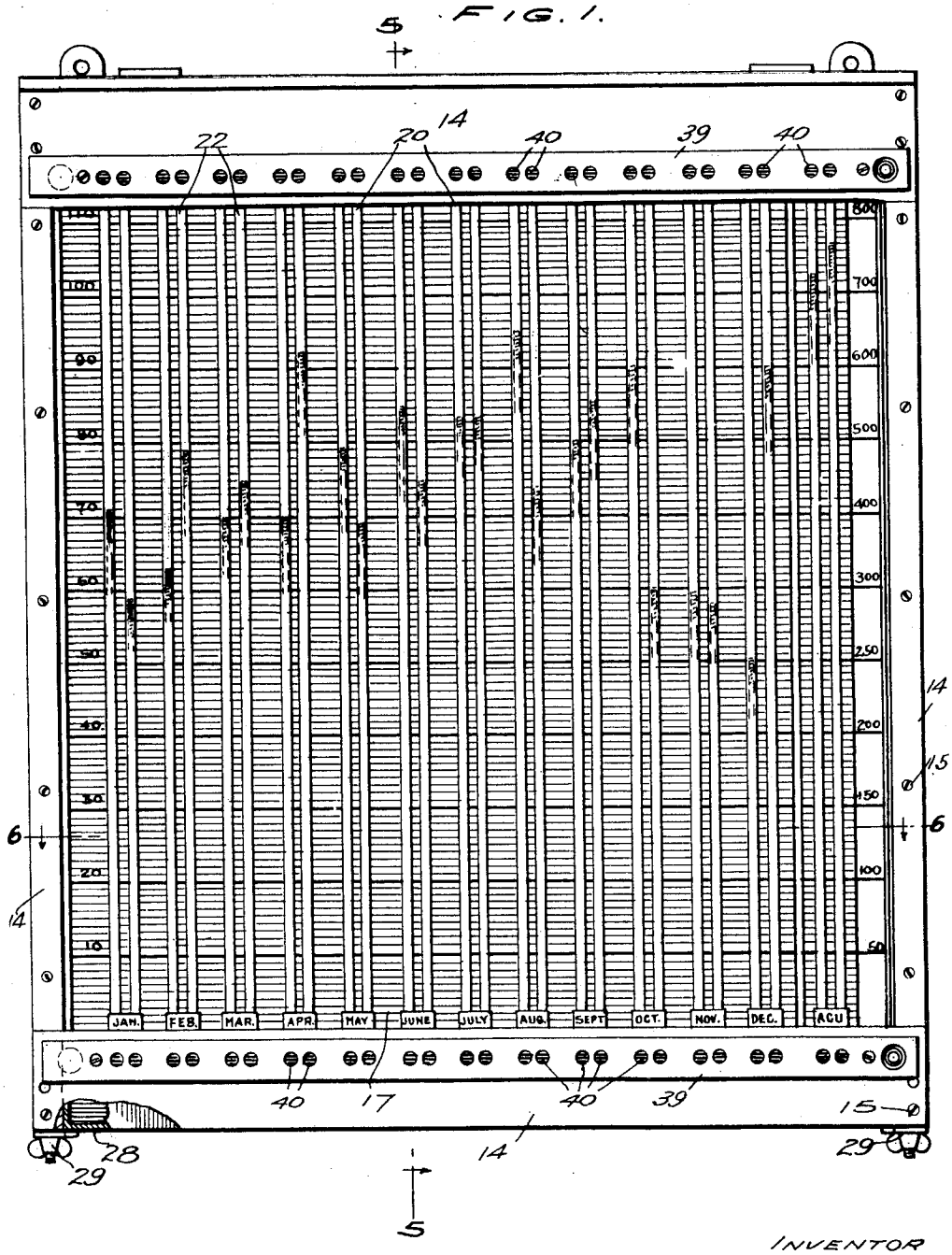
Jan. 27, 1931. C. M. DAVENPORT 1,790,200

CHART

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FIG. 1.




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FIG. 2.

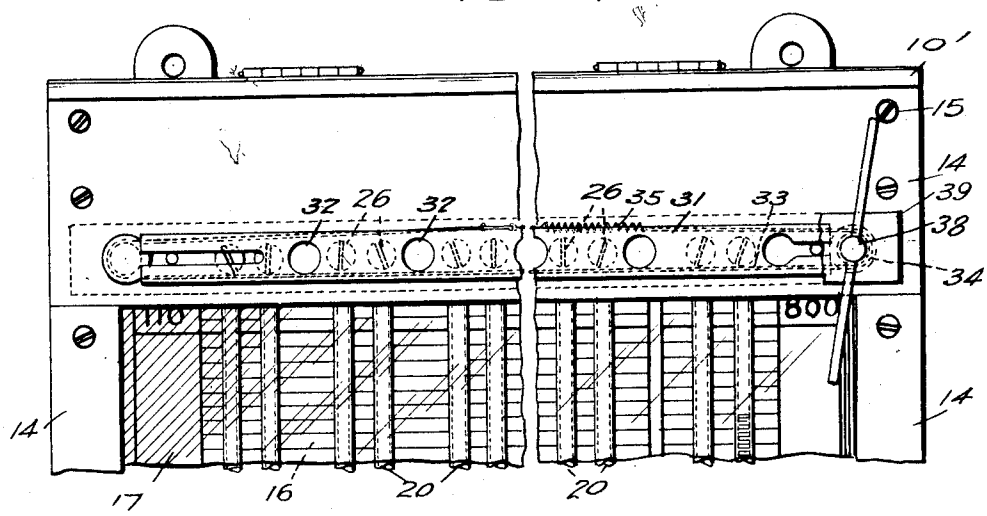



FIG. 3.

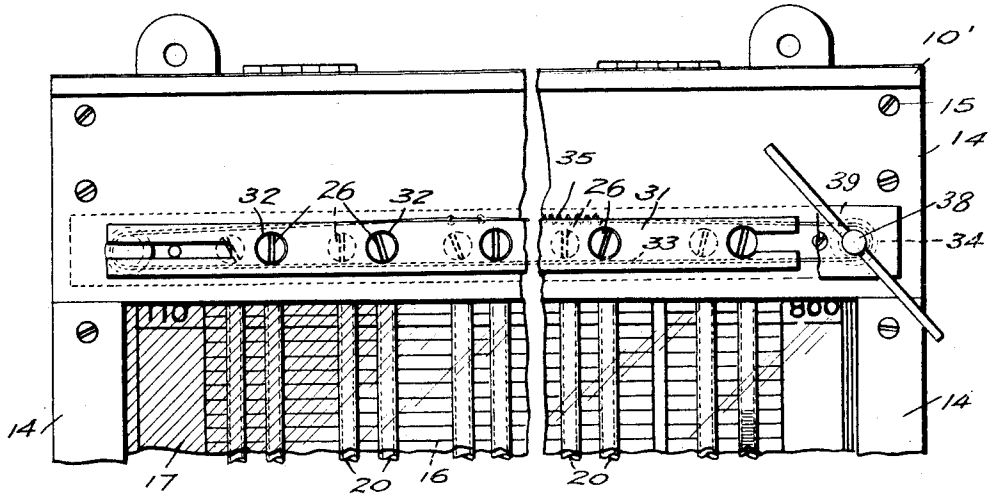
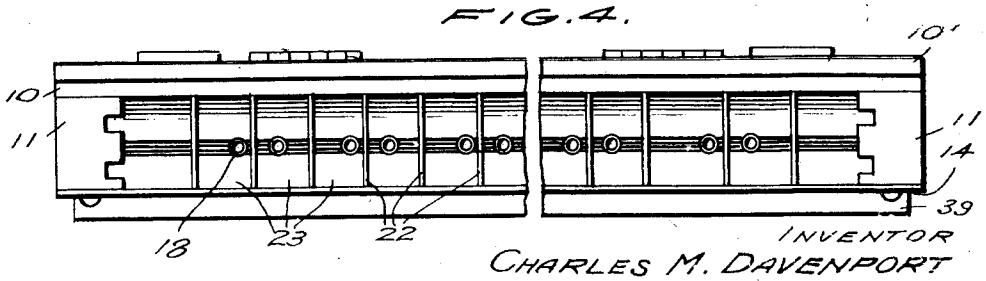



FIG. 4.




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FIG. 5.

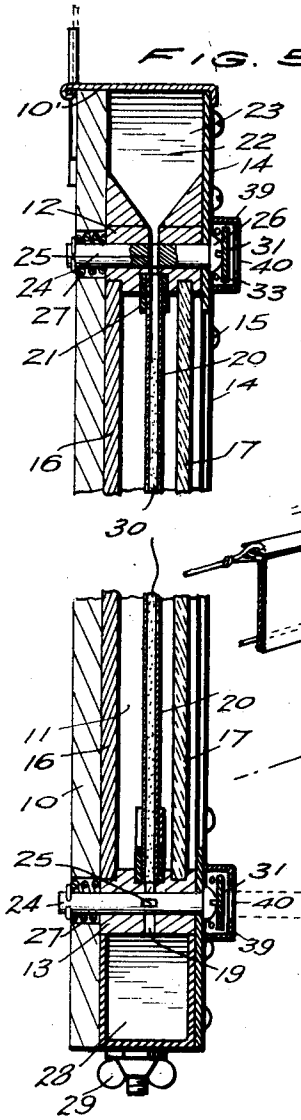
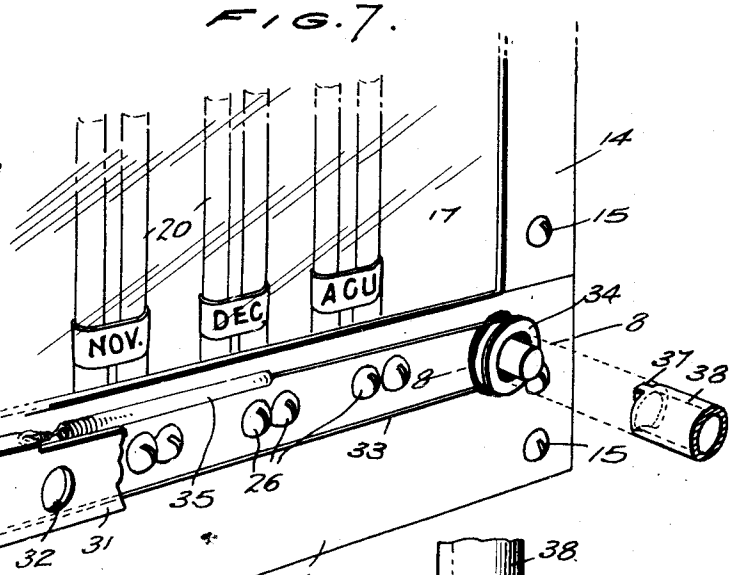



FIG. 7.



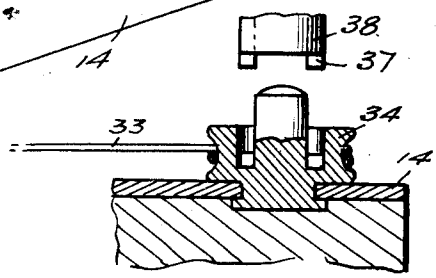




FIG. 8.

FIG. 6.

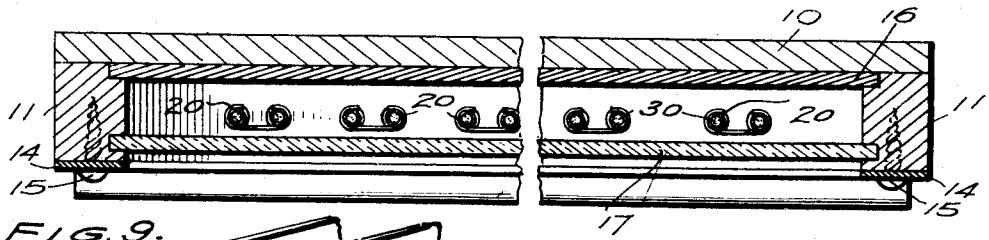
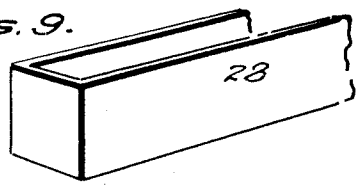



FIG. 9.




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Patented Jan. 27, 1931 1,790,200

# UNITED STATES PATENT OFFICE

CHARLES M. DAVENPORT, OF RICHMOND, VIRGINIA

## CHART

Application filed January 17, 1930. Serial No. 421,579.

This invention relates to charts and more particularly to that type of mechanical chart having indicatory means for use in comparison with a scale.

The object of this invention is to provide a chart of the kind above described which graphically displays comparative facts in an intelligent and readily understood manner.

Another object of this invention resides in the provision of a chart of the kind described in which a series of transparent containers are used to receive fluent indicatory material and separate valve controlled reservoirs for each of the containers.

A still further object of this invention is to provide a valve-controlled means for draining the transparent containers of the indicatory material and a guard locking means for both the reservoir and the draining valves to prevent unauthorized operation of the same.

With these and other objects in view this invention consists of certain novel combinations and arrangement of parts as will be fully set forth in the following description and illustrated in the accompanying drawings wherein—

Figure 1 is a front elevation, partly in section;

Figure 2 is an enlarged front elevation of the upper portion of the device with the guard casing removed showing the valve guard in one position;

Figure 3 is a view similar to Figure 2 with the valve guard in another position;

Figure 4 is a view looking down on the top of the chart with the reservoir lid raised;

Figure 5 is a section taken on line 5—5 on Figure 1;

Figure 6 is a section taken on line 6—6 on Figure 1;

Figure 7 is a fragmentary perspective of one corner of the chart showing valve guard actuating means;

Figure 8 is a section taken on line 8—8 of Figure 7; and

Figure 9 is a fragmentary perspective of one end of the draining receptacle.

Referring to the parts by reference numerals, 10 indicates a back of any suitable material having side pieces 11, running the entire length thereof and what will be termed an upper partition 12 and a lower partition 13 are placed transversely across the back 10 adjacent the upper and lower edges respectively thereof. Suitable facing strips 14 are secured to the pieces 11 and partitions 12 and 13 by fastening means 15. The pieces 11 and partitions 12 and 13 are grooved to removably receive a chart card 16 and a glass covering 17. A series of vertically disposed openings 18 and 19 are provided in the partitions 12 and 13, respectively, and connecting these openings are a series of transparent containers or tubes 20. These tubes are securely retained in place by means of the gaskets 21 which surround that portion of the tubes in the partitions. By reference to Figure 5 it will be seen that the tubes 20 are thus securely held in place between the glass covering 17 and the chart card 16. These tubes 20 are grouped in pairs in the embodiment of my invention illustrated, but any grouping or arrangement of the same may be had to more clearly and graphically display the comparative facts for which the chart in each instance is designed.

On the upper face of the partition 12 is a trough-like hopper provided with a hinged cover 10′ and having a series of partitions 22 forming a separate reservoir 23 for each of the transparent tubes 20. Each reservoir 23 has one of the openings 18 in communication with one of the tubes 20. Passing transversely through the upper and lower partitions 12 and 13 and intersecting each opening 18 and 19, respectively, in these partitions are a plurality of rotatable valves 24, each of which consists of an elongated body having a port 25 and an instrument engagement head 26. The opposite end of the valve from that of the head 26 is wrapped with a spring 27 to retain the port of the same in proper position relative to the openings 18 or 19, but in no way affects the rotation of the valve. For the purpose of better description, the valves in the upper partition 12 will hereafter be referred to as the filling valves, while those in the lower partition the draining valves. A draining receptacle 28 is releas-

ably secured beneath the lower partition 13 by means of the wing nuts 29.

From the foregoing it will be seen that the flow of fluent material from the reservoirs 23 into the transparent containers or tubes 20 is controlled by the filling valves 24 by rotating the same to align the ports therein with the openings 18, the draining valves in the lower partition 13 at this time being set to prevent the flow of material out of the tubes 20 into the draining container 28. In this manner the fluent indicatory material 30 will be allowed to flow into the containers or tubes 20 until the proper height is reached. If for some reason more material 30 is allowed to flow into a certain tube the draining valve for that tube is rotated to align its port with an opening 19 and the proper amount of material 30 allowed to pass into the draining receptacle 28. These draining valves are obviously also used to drain the tubes 20 for any reason.

A valve guard means is provided for both the filling and draining valves. The construction of the guard means for each set of valves is the same, therefore, the description of one will suffice. A guard strip 31 having a series of apertures 32 is slidable over the valve heads 26 by means of an endless carrier 33 trained over sheaves 34. This endless carrier 33 has a resilient element 35 in the same and in connection with the strip 31 to provide the proper friction on the sheaves 34. A pair of key-receiving sockets 36 are found in the sheaves 34 to receive the projections 37 of an operating key 38. Covering this strip 31 is a casing 39 having a series of apertures 40 formed therein. To gain access to the valve heads for operation it is necessary to move the guard strip 31, by rotating the sheave 34 with the key 38 to such an extent only to align the proper apertures 32 and 40 with the desired valve to allow for the passing of an instrument through the casing 39 and strip 31 for engagement with the valve head to rotate the same.

The present embodiment of this invention is shown for use as a chart to indicate the monthly sales, production or attendance with a comparative indication together with an accumulative and accumulative comparison indication. One specific use is for indication of the yearly sales of an automotive agency. Two tubes are provided for each month. In one tube fluent indicatory material (preferably colored sand) of one color would be fed until the proper height was reached on the chart card to indicate the number of cars, parts, or cost of the same, the agency was allotted by the manufacturer while in the tube next adjacent thereto a fluent material of a color contrasting that of the first would be fed as the sales were made. The accumulated sales, as well as the yearly allotment would be indicated by the material in the tubes labeled ACU. It being obvious that the chart card readings for use in comparison with the material in the last mentioned tubes would be different from the remainder of the card, in fact to contrast the yearly or accumulative indication, that portion of the chart card scale used with the yearly accumulative tubes should be of a different color from those used for the monthly indications.

Thus the number of cars or parts sold, or money received from the sales for one month in comparison with the allotment for that month, as well as the accumulative sales in comparison with the yearly allotment, will be graphically indicated by the heights of the different colored materials in the tubes against the scale on the chart card.

From the foregoing it is evident that a mechanical chart has been provided that makes no use of blocks, pegs, tapes or other well known means and methods for graphically displaying comparative facts, but instead provides a chart using fluent indicatory material, the flow of which into transparent retaining receptacles is valved controlled. The invention contemplates the use of said means in a chart for the graphic display of facts whether they be sales, attendance, temperature records or any other facts capable of graphic display.

Having thus described the invention it is not desired to limit the same to the embodiment shown and described, but to cover all such as properly come within the scope of the appended claims.

Having thus described my invention what I claim is—

1. A device of the character described including a support, a plurality of containers on said support each having a reservoir, fluent indicatory material in said reservoirs, and means for controlling the flow of said material into said containers.

2. A device of the character described including a support having a plurality of transparent containers thereon, a reservoir for each container, fluent indicatory material in said reservoirs, valve means to control the flow of indicatory material into said containers, and valve-controlled drain means for each of said containers.

3. A device of the character described including a support having a plurality of transparent containers thereon, a scale behind said containers, fluent indicatory material in said containers for comparison with said scale, and means for controlling the flow of said fluent indicatory material into and out of said containers.

4. A device of the character described including a support having a plurality of transparent containers thereon, a scale behind said containers, and a fluent indicatory material in said containers for comparison with said scale, said indicatory material in

certain of said containers being of a contrasting color to that material in other of said containers.

5. A device of the character described having indicatory means, a second means for adusting said indicatory means, and a third means to prevent the unauthorized operation of said adjusting means.

6. A device of the character described having transparent containers, indicatory means in the containers, means for adjusting the amount of indicatory means in said containers, and means to prevent the unauthorized operation of said adjusting means.

7. A device of the character described having a plurality of containers, fluent indicatory material in said containers, valves to control the flow of said indicatory material into and out of said containers, and guard means for said valves to prevent the unauthorized operation of said valves.

8. A device of the character described including a support having a plurality of transparent tubes thereon, a scale on said support and behind said tubes, a reservoir for each of said containers, a fluent indicatory material in said reservoirs, a valve for each of said containers to control the flow of fluent material into said containers, a drain receptacle, and a valve for each of said containers to control the flow of fluent material from said containers into said drain receptacle.

9. A device of the character described including a support having a plurality of transparent tubes thereon, a scale on said support and behind said tubes, a reservoir for each of said containers, a fluent indicatory material in said reservoirs, a valve for each of said containers to control the flow of fluent material into said containers, a drain receptacle, a valve for each of said containers to control the flow of fluent material from said containers into said drain receptacle, and a guard means for said valves to prevent the unauthorized operation of said valves.

10. A device of the character described including a support, a fixed member of comparison on said support, a plurality of containers on said support, and fluent indicatory material in said containers for comparison with said fixed member.

In testimony whereof I affix my signature.

CHARLES M. DAVENPORT.