April 8, 1941. P. MARIENTHAL 2,237,443

PROPORTIONAL MIXING SCALE

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Fig. 1.

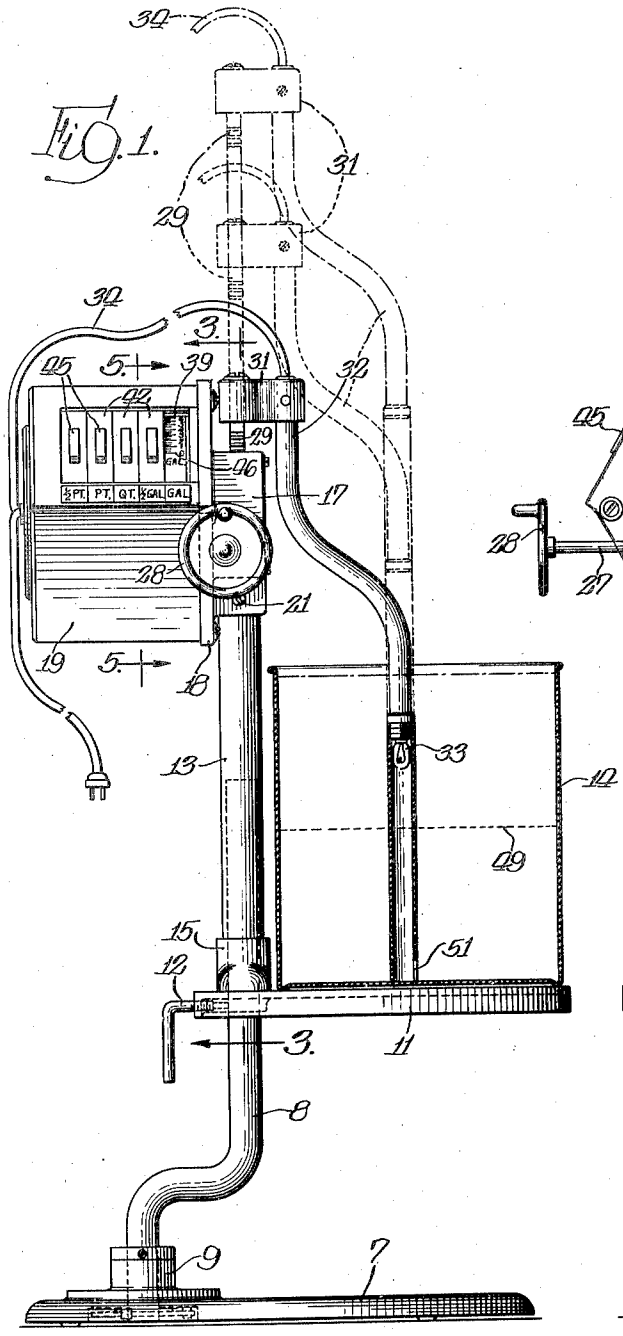
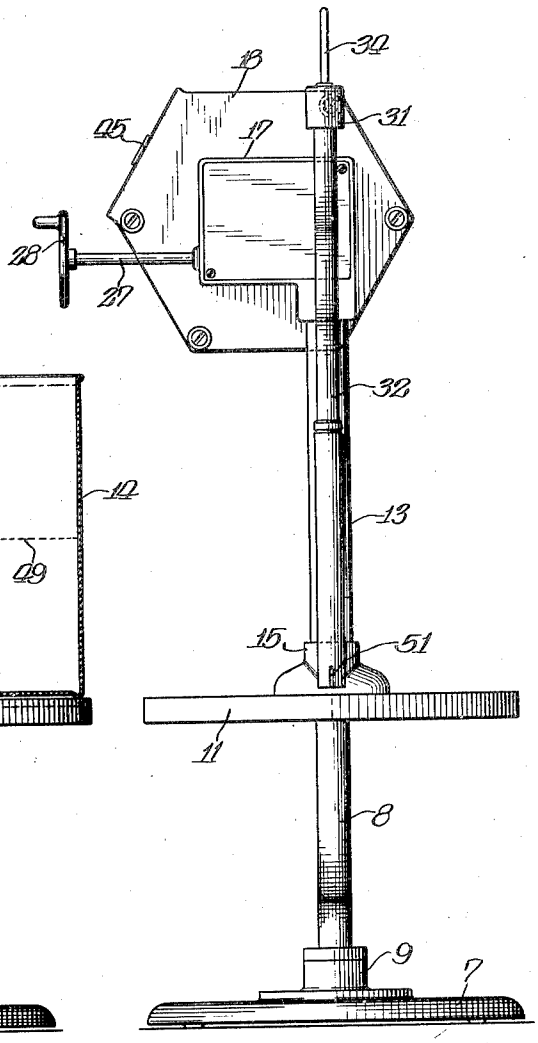


Fig. 2.



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Fig. 3.

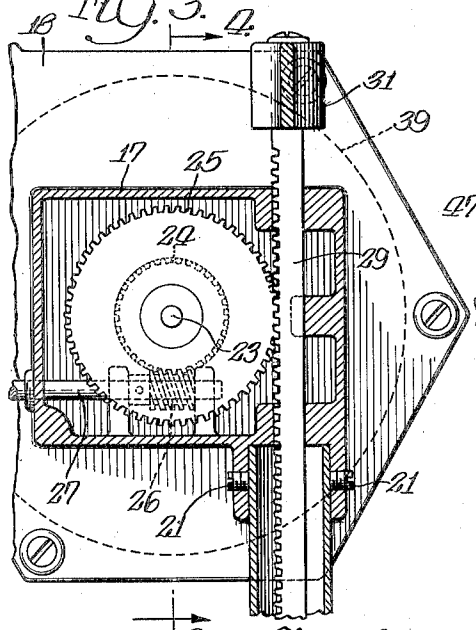
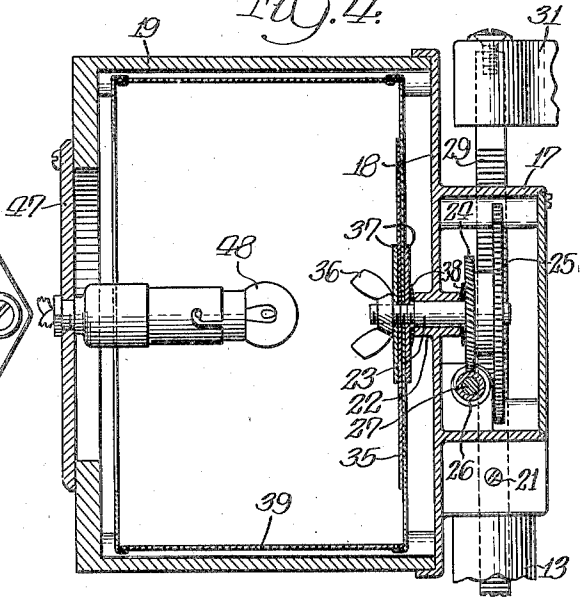


Fig. 4.



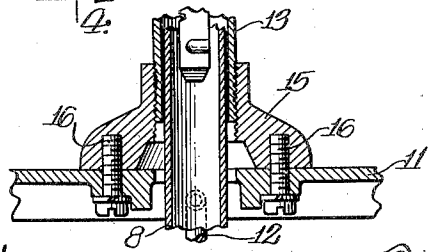


Fig. 5.

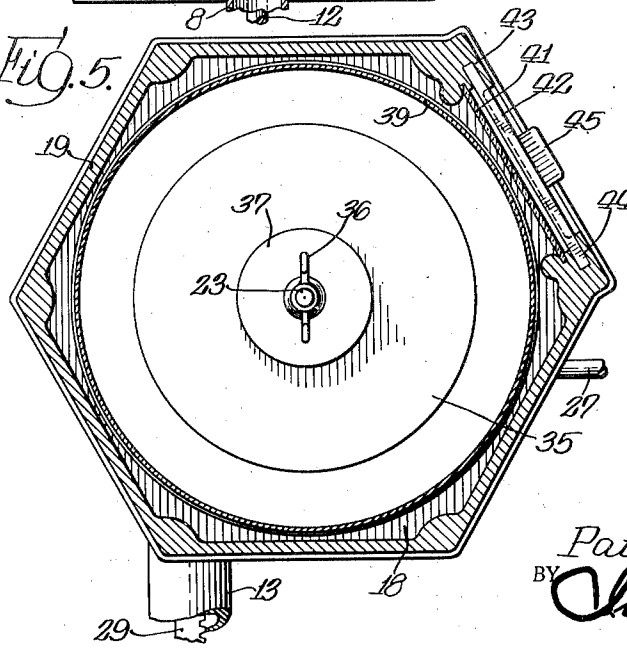
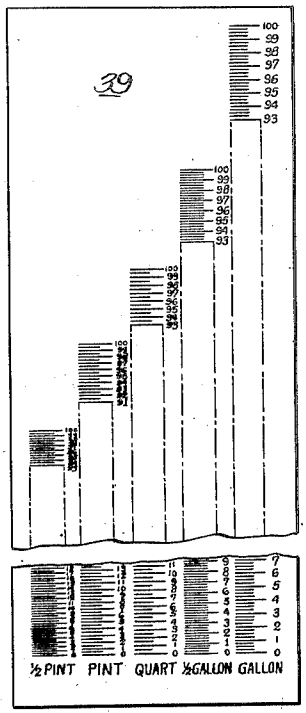


Fig. 6.



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UNITED STATES PATENT OFFICE

2,237,443

PROPORTIONAL MIXING SCALE

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Application September 19, 1940, Serial No. 357,431

10 Claims. (Cl. 33—126.7)

This invention relates in general to the mixing of paints, lacquers, and the like for the purpose of obtaining a desired color or shade from an admixture of different colors or shades, and aims to provide a device by which predetermined proportions of different liquids may be accurately measured in a mixing receptacle to insure the desired proportion of each constituent in the resultant liquid mixture.

A scale for this purpose is disclosed in Patent No. 2,169,952, issued August 15, 1939, and an apparatus for conditioning and dispensing lacquers, paints and the like is disclosed in Patent No. 2,131,662, issued September 27, 1938.

The general purposes of the present invention are to improve the construction of the type of scale disclosed in Patent No. 2,169,952, adapt the same for use with apparatus of the character disclosed in Patent No. 2,131,662, and make practical its use for accurate proportional determinations in mixing containers of various sizes ranging from one-half pint to one gallon or even larger.

A specific object of my invention is to provide a scale for the purpose indicated which will include an adjustable indicator so constructed and located that it may be clearly seen by the user, thus contributing toward accuracy in its setting and accuracy in attaining the desired proportions of the ingredients in a produced mixture.

Another purpose is to provide in conjunction with a scale indicator having a plurality of scale graduations corresponding respectively with mixing receptacles of different sizes, a plurality of slides or shutters which will permit only one scale to be seen at a time. This minimizes the possibility of error in reading the indicator.

Another advantageous feature resides in mounting the indicator drum so that it may be adjusted on its driving shaft to enable the accurate setting of the indicator with relation to the position of the light transmitting element.

Another feature resides in the adjustability of the apparatus which enables the platform upon which the mixing receptacle rests to be located in proper position with respect to the containers mounted in the mixing machine and from which the constituents of the desired mixture to be made are drawn. This adjustment is accomplished without disturbing the relation between the indicator and the light tube.

Another feature resides in the elimination of the formation of bubbles on the lower end of the light tube as the result of accidental contact with the paint or lacquer in the mixing receptacle. This result is attained by providing a slot in the end of such tube.

Other purposes and advantages of my invention will be readily appreciated from the accompanying drawings of one embodiment thereof when considered in connection with the following description.

Referring to the drawings:

Fig. 1 is a side elevation of an apparatus constructed in accordance with my invention.

Fig. 2 is an end elevation looking toward the left at Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a sectional view on the line 5—5 of Fig. 1; and

Fig. 6 is a developed view of the indicator drum showing the scales thereon corresponding with the various sizes of containers with which the apparatus may be used.

Referring to the drawings more in detail, reference character 7 indicates the base of the apparatus which in use may be positioned upon the container supporting shelf of the mixing machine disclosed in Patent No. 2,131,662. A laterally offset post 8 is rotatably supported by this base in a suitable bearing 9 so that the post may be rotated to horizontally adjust the position of the can supporting table 11 which is vertically adjustable upon the post and is designed to be locked thereon in adjusted position by a set screw 12. A tubular standard 13 fixedly attached at its lower end to the table 11 telescopes over the post 8 so as to afford a considerable range of vertical adjustment of the standard without disturbing the stability of the sliding connection between the standard and the post 8. It will be apparent, therefore, that the table 11 is capable of both vertical and horizontal adjustments to bring the container 14 in which the mixture is to be made into proper position for receiving the constituents drawn from the cases carried by the mixing apparatus. These adjustments enable my invention to be used with mixing receptacles of various sizes without spilling or dripping of the various liquids when poured from the mixing apparatus into such receptacles.

The tubular standard 13 is threaded at its lower end into a supporting foot 15 which in turn is rigidly secured to the table 11 by bolts 16. The upper end of the tubular member 13 is received in a socket formed integrally with a gear case 17, which in turn is formed integrally with the end

18 of an indicator housing 19. Set screws 21 lock the upper end of the tubular member 13 rigidly in the socket.

In a bearing 22 carried by the end wall 18 is journalled a shaft 23 carrying a worm wheel 24 and a pinion 25. The worm wheel meshes with and is adapted to be driven by a worm 26 on a shaft 27 provided at its outer end with an operating hand wheel 28. The pinion 25 meshes with a rack 29 suitably guided for vertical movements in the rear portion of the gear case. The lower end of the rack projects downwardly into the tubular member 13, as will be apparent from Fig. 3.

The upper end of the rack 29 carries a head 31 in which is fixedly mounted the upper end of a light transmitting tube 32 laterally offset between its ends so that its lower end may be lowered into a receptacle 14 resting on the table 11. A light bulb 33 is mounted in the tube 32, and the light rays emitted therefrom are directed downwardly in the tube and become visible only at the lower end thereof. A cord 34 entering the upper end of the tube 32 furnishes current for the light 33.

One end 35 of an indicator drum disposed within the housing 19 is carried by the shaft 23 to which it is adjustably locked by a thumb nut 36 threaded upon the threaded end of shaft 23. The drum end is clamped between the disks 37, and antifriction washers 38 are disposed at the ends of the bearing 22 to prevent friction imposed by the clamping action from impeding the rotation of the shaft. The circumferential wall 39 of the indicator drum is formed of suitable translucent material, such as Celluloid or the like upon which is printed a plurality of scales, each unit of which represents one per cent of the depth of a container to be positioned on the table 11. The scales here shown for illustrative purposes correspond to containers of one-half pint, pint, quart, one-half gallon, and gallon sizes.

One side of the housing 19, which is illustrated as being of hexagonal contour, is provided with a sight opening closed by a sight glass 41 through which the scales on the indicator drum may be observed. In order to avoid confusion and error in reading the indicator, the housing is provided in front of the sight glass with opaque slides 42 which number one less than the number of scales on the indicator. The ends of these slides project into grooves 43 and 44 formed in the housing 19 above and beneath the sight opening, and each slide is equipped with a finger piece 45 by which the slide may be moved laterally viewing Fig. 1. It will be readily apparent that the slides may be adjusted so as to expose to view any desired scale on the indicator and such one only. For instance, if a gallon container is to be used, the slides will be positioned as shown in Fig. 1 exposing the gallon scale to view. If a container of smaller capacity is to be used, that scale corresponding to the size of the container will be exposed to view by manipulating slides 42. When one scale is exposed, the others will be concealed, thereby reducing the possibility of confusion by the operator when reading the scale. A line 46 extending from side to side across the sight glass indicates the reading point of the scales, and the zero point of the scale should coincide with this line when the lower end of tube 32 is just touching the bottom of any container for which the apparatus is designed.

In order to properly set the device after the parts have been assembled in the manner above indicated, a receptacle is positioned on the table 11, and the hand wheel 28 is manipulated to lower the tube 32 into the receptacle until the lower end of the tube just touches the bottom of the receptacle, as shown in full lines in Fig. 1. The end plate 47 of the housing 19 is then removed, permitting access to the thumb nut 36, which when loosened will permit the indicator drum to be turned relatively to the shaft 36 so as to bring the zero points of the scales into alignment with the reading line 46 on the sight glass. The thumb nut is then tightened to lock the adjusted indicator drum to the shaft 23. To facilitate observation of the scales, the end plate 47 carries a light bulb 48 also connected to the light cord 34 so that the bulbs 33 and 48 will both be supplied with current.

Assume that a mix is desired of two different colors of paint or lacquer contained in cans carried by a mixing machine, such as illustrated in Patent No. 2,131,662, above mentioned. The base 7 of the apparatus is placed on the shelf of the mixing machine, a receptacle of the desired size is placed on the table 11 after the tube 32 has been raised to permit the placement of the receptacle, the table is vertically adjusted, if necessary, to bring the top of the receptacle at the proper level with respect to the container from which the color is to be drawn, and the post 8 is swung on the base 7 to properly position the receptacle.

For simplicity, we may assume that the receptacle 14 here illustrated is of one gallon capacity and that the user desires to obtain a mix therein of two colors in equal proportions. The hand wheel 28 is manipulated to lower the tube 32 into the receptacle until the gallon scale reads 50, which indicates 50% of the capacity of the receptacle. With this reading, the lower end of tube 32 will be disposed midway the height of the receptacle or substantially at the dotted line 49 of Fig. 1. This position of the tube is illustrated by the intermediate dotted line showing thereof. A liquid of one of the desired colors is then permitted to flow into the receptacle until the liquid level so closely approaches the lower end of the tube 32 that the light rays issuing from the lower end of the tube are reflected directly back from the liquid surface into the tube so that they are not visible to the user. When this point has been reached, the flow into the receptacle is stopped, and the user knows that he has in the receptacle the exact quantity of liquid desired. Should he accidentally admit a little too much liquid so that the liquid level touches the end of the tube, such contact would be apt to leave a bubble of liquid across the end of the tube which would obstruct the light and interfere with the accuracy of subsequent operations. To obviate this possibility, the tube is provided at its lower end with a slit 51 which precludes the formation of such an undesirable bubble.

The user then manipulates handle 28 to raise the tube to the upper dotted line position shown, in which position the scale reading will be 100. He thereupon moves the apparatus along the shelf into position to receive liquid of the other desired color from the container on the mixing machine and withdraws liquid from this container into the receptable until it approaches the lower end of tube 32 sufficiently close to shut off the light beams, whereupon the pouring is discontinued, and the receptacle 14 contains the two desired colors in exactly the required proportions.

The same procedure may be followed for the mixing of any desired number of colors in a receptacle of any desired capacity. The only adjustment necessary in converting the apparatus from one receptacle capacity to another is the moving of the slides 42 so as to expose the scale corresponding to the particular capacity of receptacle to be employed.

The structural details shown and described are intended as illustrative merely of the principles of my invention and are capable of considerable modification without departing from the scope of the invention as defined in the following claims.

I claim:

1. In a proportional mixing scale, the combination of a base, a receptacle supporting table carried by and adjustable vertically and horizontally relatively to said base, a standard carried by the table, a light transmitting element adapted to be projected into a receptacle on said table to illuminate the interior of the receptacle, means including a rack and pinion for vertically adjusting the position of said light transmitting element with respect to said receptacle, and an indicator operable coincidently with the movement of said light transmitting element, provided with a plurality of scales from which the height of the lower end of said element above the bottom of different sized receptacles may be ascertained.

2. In a proportional mixing scale, the combination of an adjustable table adapted to support receptacles of different sizes, a standard rising from said table, an indicator carried by said standard, a light transmitting element, and means including a rack and pinion for vertically adjusting said element relatively to a receptacle on the table and for simultaneously operating said indicator, the indicator comprising a plurality of scales graduated to receptacles of different capacities and by observation of which the position of said element in a receptacle of known capacity may be ascertained.

3. In a proportional mixing scale, the combination of a standard, a table for supporting a receptacle, an indicator comprising a rotatable drum provided with a plurality of scales, each graduated in conformity with a receptacle of a different size, a light transmitting element, and means for adjusting the vertical position of said element with respect to the receptacle and simultaneously actuating said indicator in conformity with the movements of said element.

4. In a proportional mixing scale, the combination of means for supporting a receptacle, a standard fixed to said supporting means, an indicator carried by said standard, said indicator comprising a rotatable element provided with a plurality of scales, adjustable means for concealing all but a selected one of said scales, a light transmitting tube movable toward and from said supporting means, and manually operable means for adjusting said element and simultaneously adjusting said indicator so as to permit the position of said element to be ascertained from said indicator.

5. In a proportional mixing scale, the combination of a supporting table, a standard fixed with respect to said table, an indicator carried by said standard and comprising a rotatable drum provided with a plurality of depth indicating scales, adjustable means for exposing to view any selected one only of said scales, a vertically movable rack, a light transmitting tube carried by said rack, and means for simultaneously and correspondingly adjusting the positions of said rack and said indicator drum.

6. In a proportional mixing scale, the combination of a standard, an indicator carried thereby comprising a rotatable drum provided with a plurality of depth indicating scales, a vertically adjustable rack, a light transmitting tube supported by said rack, a shaft, a pinion thereon meshing with said rack, an adjustable connection between said drum and said shaft permitting adjustment of the drum relatively to the shaft, and means for actuating said shaft to adjust the vertical position of said tube and correspondingly adjust the angular position of said indicator drum.

7. In a proportional mixing scale, the combination of a standard, a housing carried by the standard, a rotatable drum disposed within the housing and provided on its perimeter with a plurality of depth indicating scales, said housing being provided with a sight opening, means adjustably mounted in said opening for concealing all but a selected one of said scales, a vertically adjustable member, a light transmitting element carried by said member, and means for simultaneously adjusting said member and correspondingly rotating said drum.

8. In a proportional mixing scale, the combination of a standard, a housing carried thereby, a shaft extending into said housing, a drum supported on said shaft, releasable means for attaching said drum to said shaft to permit adjustment of the drum relatively to the shaft upon release of said means, a pinion on said shaft, a vertically adjustable rack meshing with said pinion, means for rotating the shaft, and a light transmitting element carried by said rack.

9. A proportional mixing scale comprising a vertically adjustable light transmitting tube open at its lower end for the emission of light therefrom, said lower end being longitudinally slitted to prevent the formation of a bubble at the end of the tube in the event of contact of said tube end with a viscous liquid.

10. A proportional mixing gauge comprising a light transmitting tube adapted to be projected into a mixing receptacle, a source of light located in said tube above the open lower end thereof, said tube being provided at said lower end with a longitudinal slit, means for vertically adjusting the position of said tube, and means for indicating said adjusted position.

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