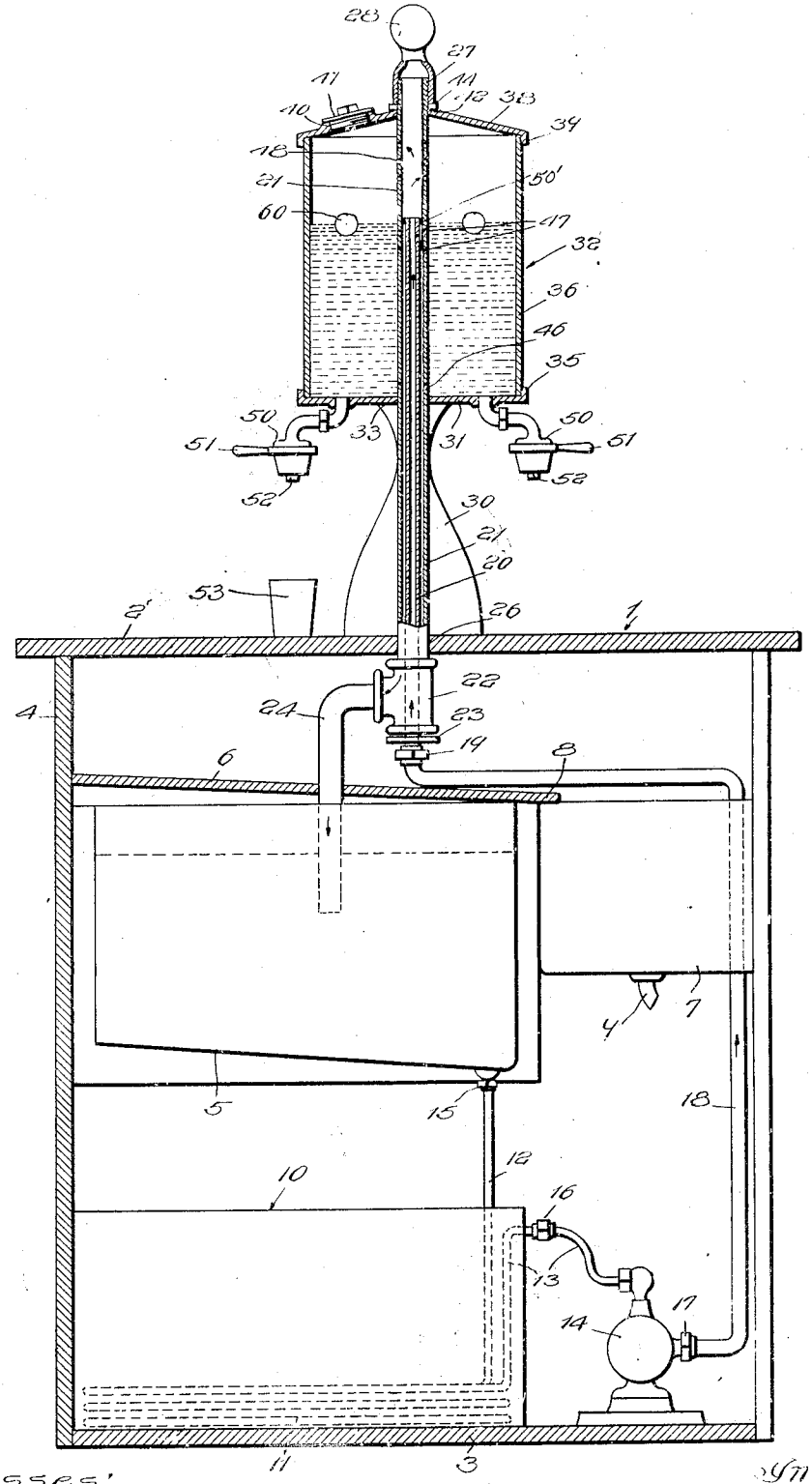
May 17, 1927.

1,628,853

F. B. LOMAX

LIQUID DISPENSER

Filed March 6, 1926



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Patented May 17, 1927. 1,628,853

UNITED STATES PATENT OFFICE.

FRANK B. LOMAX, OF CHICAGO, ILLINOIS.

LIQUID DISPENSER.

Application filed March 6, 1926. Serial No. 92,759.

My invention relates in general to a method of and a dispenser for distributing liquid, and more particularly to distributing apparatus especially adapted for dispensing uncarbonated beverages.

During recent years the increase in the consumption of uncarbonated beverages has created a demand for improved liquid dispensing mechanism. To meet this demand many improved dispensers have been placed on the market. At most, the average of such common dispensers merely provides for the cooling of the liquid which is usually distributed therefrom by a gravity feed. Obviously, as the level of the liquid in the container of the dispenser drops, the less will be the pressure behind the liquid being dispensed.

I propose to provide a dispensing system wherein I utilize an impelling device or pump for performing two functions, namely, circulating the liquid through a cooling unit and contemporaneously creating and maintaining a pressure behind a column of liquid on display for enabling the liquid to be more expeditiously dispensed.

Incidentally, I employ the pump to create a spray in a transparent or glass receptacle containing a column of liquid. This spray serves as a display feature and greatly enhances the picture of the liquid or beverage presented to prospective customers. Then, too, I contemplate placing fruit, preferably in sliced condition, in the receptacle, which fruit will be maintained in a constant state of agitation by the incoming spray. The fruit, of course, will be the same as that employed in flavoring the beverage or drink.

Also, I purposely so construct my dispensing system that liquid can only be withdrawn therefrom when the impelling device is in operation, thus assuring that the liquid is cold when withdrawn. This is a decided improvement in the dispensing art, inasmuch as it precludes careless clerks from serving beverages that have not been properly cooled. In other words, due to the inherent features of my system, the human element, as far as responsibility for the cooling of the beverage is concerned, is obviated.

Another feature of my invention which is also inherent in the system pertains to the maintaining of the beverage at a constant level in the transparent display container. That is to say, this feature is also wholly dependent upon the system rather than any human agency. This feature, however, necessarily depends upon the operation of the impelling device, for as soon as the pump ceases functioning the level of the fluid will drop.

Now as long as the impelling device or pump is operating, cold beverage may be dispensed to customers. Upon the rendering of the pump inoperative not only will the spraying of the beverage cease and it will be impossible to dispense beverage, but due to the inherent features of my novel construction all of the fluid in the display receptacle will automatically gravitate to a container or tank, preferably disposed out of sight under the counter or fountain associated therewith. The supply of liquid in the dispensing system may be, from time to time, replenished by pouring additional beverage in the container or tank under the counter.

Furthermore, I contemplate the provision of means associated with the display container whereby the pressure therein may be overcome to enable the liquid contained therein to be withdrawn more expeditiously when the pump is rendered inoperative. This means also permits of the introduction of fruit into the transparent receptacle.

Other objects and advantages of the present invention will more fully appear from the following detailed description taken in connection with the accompanying drawing which illustrates one embodiment thereof and in which the single figure is an elevation of my novel dispenser partly in section and clearly illustrating the circulatory action of the liquid.

Referring now to the single figure in detail, 1 designates generally a counter which may be of any usual or conventional construction. If it is so desired, the counter 1 may consist of part of the usual dispensing fountain or, on the other hand, it may consist of an entirely separate and distinct unit. The counter 1 consists essentially of a top 2, a bottom 3, and a plurality of sides 4. Positioned inside of the counter under the top 2 is a liquid or beverage supply tank 5 into which the beverage to be dispensed is poured. Disposed on top of the tank 5 is a drain board 6 upon which the glasses may be placed after being washed ready for use. The drain board 6 and the tank 5 may be

attached to the counter 1 in any suitable or desirable manner.

Located along side of the tank 5 is a washing tank 7 in which the dispensing glasses may be washed after being used. One end 8 of the drain board 6 extends over the edge of the washing tank 7, so that the water on the board may drain into the tank. This construction precludes any possibility of the water from the glasses on the drain board getting into the beverage supply tank. The washing tank 7 may be connected by a pipe 9 to any suitable drain pipe or sewerage unit. Water may be supplied to the tank 7 in any conventional manner.

Immediately below the beverage supply tank 5 is an ice box designated generally by the reference numeral 10 in which is disposed a plurality of cooling coils 11 through which the beverage being dispensed is adapted to flow. The ice box 10 may be cooled either by artificial means or by ice placed therein. One end of the coil 11 is connected by a pipe 12 to the bottom of the beverage supply tank 5 and the other end of the coil 11 is connected by a pipe 13 to an impelling device or pump 14 of any conventional construction. The pipe 12 is preferably connected to the tank 5 through the means of a union 15 which permits of the ready separation of the pipe 12 from the tank 5. Also, a union or coupling device 16 may be disposed in the pipe line 13 to permit of the ready separation of the pump 14 from the system.

The pump 14 is positioned on the bottom 3 of the counter 1 and is connected by means of a coupling or union 17 at its discharge end to a pipe line 18 extending upwardly to a position immediately above the drain board 6. The upper end of the pipe line 18 is coupled to a vertical pipe 20 by means of a union 19. The pipe 20 telescopes a tube 21 and a T 22 associated with the lower end of the tube 21. The lower end of the T 22 is plugged by a closure piece 23 threaded therein. This closure piece 23 is preferably ring like in construction and serves as a gland to prevent beverage from escaping from the T 22 along the outer periphery of the pipe 20.

The T 22 has threaded therein at right angles to the tube 21 a bent pipe 24 the lower end of which discharges into the beverage supply tank 5. The lower end of the tube 21 is preferably threaded into the T 22 and is adapted to discharge therein liquid which is conveyed by the pipe 24 back to the supply tank 5. Then, too, the tube 21 extends upwardly through an aperture 26 in the top 2 and is threaded at its upper end in a tubular like element 27 equipped with a ball portion 28.

Surrounding the tube 21 on top of the counter 1 is a tubular pedestal 30 upon the top of which is carried a bottom 31 of a display receptacle designated generally by the reference character 32. The bottom 31 is equipped with an aperture 33 through which the tube 21 extends. The tube 21 may be welded to or attached in any other suitable manner to the bottom 31, so as to prevent any liquid in the container 32 to escape through the aperture 33 around the periphery of the tube 21. The bottom 31 is equipped with a annular flange 35 which surrounds and abuts a cylindrical glass container or casing 36. The casing 36 should be tightly fitted in place on the bottom 31 so as to preclude any possibility of leakage. Mounted on top of the cylindrical glass casing 36 is a slanting top piece 38 equipped with an annular flange 39 which surrounds and abuts the upper edge of the casing. The top 38 is equipped with an aperture 40 in which is threaded a removable plug 41. Also, the top 38 is equipped with a concentric opening 42 through which extends the upper end of the tube 21. The circular member 27 is furnished with an annular flange or shoulder 44 which abuts the upper surface of the slanting top 38. Obviously, in order to remove the top 38 from the casing 36 the member 27 must be unthreaded from the top of the tube 21. The ball portion 28 may be colored with any desirable color and serves to enhance the appearance of the dispenser.

The tube 21 is provided with a plurality of very small drain apertures 46 which enable all of the liquid in the receptacle 32 to be drained therefrom into the lower portion of the tube 21. These apertures 46, however, are not large enough to in any way affect the operation of my novel system. They serve purely as a draining medium. The tube 21 is also equipped with a plurality of apertures 47, the lower series of which is located in substantially a central position intermediate the slanting top 38 and the bottom 31 of the receptacle 32. The tube 21 is provided with a ring member 50′ which surrounds the top of the end of pipe 20. Then too, tube 21 is equipped with a plurality or a series of apertures 48 immediately below the top of the cylindrical casing 36. The telescoping pipe 20 extends to a short distance above the apertures 47 in the tube 21. The upper end of this pipe 20, however, does not extend to the apertures 48. The apertures 48 serve to spray the fluid emanating from the upper end of the pipe 20 into the cylindrical casing 36. The lower series of apertures 47 serves as a means of escape for the air within the casing as the same is displaced by the incoming fluid. Obviously, after the level of the fluid within the receptacle 32 extends above the series of apertures 47, they will no longer afford a means of escape for the air in the casing

32 and hence the remaining air must, of necessity, be compressed. These apertures 47 also serve in a measure as a means of escape for the fluid in the casing once the level of the fluid rises there above.

The bottom 31 of the receptacle 32 has threaded therein a plurality of dispensing nozzles or faucets 50 which may be of any conventional construction. By positioning a glass 53 below the discharge orifice 52 of the faucet 50 and operating the handle 51, liquid may be dispensed or rather discharged into the glass 53, ready for consumption.

The operation of my novel dispensing system is as follows:—

First, I desire to say that I believe my novel process of dispensing will be fully comprehended from a description of the operation of my novel dispenser for practicing the same.

The beverage to be dispensed is first poured into the beverage supply tank 5. The pump 14 is then set into operation by any suitable mechanism to withdraw beverage from the tank 15 and force it up through the pipe line 18 into the pipe 20. Before the beverage reaches the pump 14 the same must, of necessity, pass through the cooling coils 11 and hence is thoroughly cooled. The beverage is forced through the pipe 20 and is discharged from the upper end thereof into the tube 21. From the tube 21 the beverage is forced through the apertures 48 and is discharged therefrom into the casing 36 in spray formation. The sprays present a very pleasing picture to the eye. In fact, the psychological effect of such sprays serves to induce and influence prospective customers in purchasing beverage drinks.

The liquid entering the receptacle 32 serves to displace a certain amount of air therefrom which escapes through the apertures 47 into the tube 21 and is discharged into the atmosphere through the liquid in the beverage supply tank 5. Inasmuch as the influx initially into the container or receptacle 32 is greater than the efflux, the level of the liquid in the receptacle will begin to rise. Upon, however, the level of the liquid passing the lower series of apertures 47 in the tube 21, the outlet for the air displaced is rendered ineffective thus resulting in the remaining air in the receptacle being compressed. When the pressure of the compressed air in the receptacle reaches a certain amount, the level of the liquid in the receptacle will remain substantially constant. That is to say, when the pressure becomes great enough to overcome further rise of the level of the liquid, the influx will naturally be equal to the efflux from the receptacle. I have found from experience that this level lies in a plane intermediate the series of apertures 47 and the series of apertures 48. I have indicated this level in my single illustration. The efflux of the liquid will be through the apertures 47 as well as the apertures 46. Sliced fruit may, if it is so desired, be introduced into the container or receptacle 32 through the aperture 40 in the slanting top 38 by removing the plug 41. Also, by removing the plug 41 and opening the faucet 50 all of the liquid contained in the receptacle 32 may be discharged therefrom more expeditiously than would be the case if the liquid was caused to be discharged through the apertures in the tube 21. This feature is particularly advantageous when the pump is rendered inoperative and it is desired to quickly remove the fluid from the receptacle 32.

The fruit placed in the receptacle will in general float around on top of the fluid contained therein. I have indicated sliced fruit on top of the liquid in the single figure by the reference numeral 60. This sliced fruit will be maintained in a somewhat state of agitation by the incoming spray of beverage.

It will be obvious from the foregoing detailed description, as well as from the single illustration, that my pump or impelling device performs two functions, namely, circulating the fluid through the cooling coils 11 and contemporaneously creating and maintaining a pressure behind a column of liquid contained in the receptacle 32 for enabling the liquid to be more quickly dispensed. In other words, upon opening one of the faucets or nozzles 50, the pressure behind the fluid in the receptacle 32 will consist not only in the natural head afforded by the column of liquid, but in addition will include the pressure exerted thereon by the compressed air in the container or receptacle 32.

The incidental feature of employing a pump to create a spray in the transparent or glass casing 36 serves as a display feature and greatly enhances the picture of the liquid or beverage presented to prospective customers.

Also, I desire it understood that I purposely construct my dispenser in such a manner that liquid can only be withdrawn therefrom when the impelling device is in operation, thus insuring that the fluid is cold when withdrawn. In other words, should the pump 14 be rendered inoperative it will not be possible to withdraw liquid from the casing 36 through the faucets 50 due to the fact that the level of the liquid therein will immediately begin to fall and air will rush through the faucets into the receptacle and fill up the empty space therein as the liquid is displaced. If any fluid does escape through the opened nozzles 50 it will merely be a few drops which might happen to gurgle through. This is a decided improve-

ment in the dispensing art inasmuch as it precludes careless clerks from serving beverages that may not have been properly cooled to the requisite degree. Such features are inherent in my system and result in the human element, as far as responsibility for the cooling of the beverage is concerned, being obviated.

Another reason why liquid cannot be withdrawn from the nozzles or faucets 50 when the pump is rendered inoperative is that, as soon as the pump ceases to operate, the liquid in the receptacle 32 will be forced out through the tube 21 and the pipe 24 in preference to the faucet, due to the difference in height, or rather the position of these members. In other words, the liquid will seek the lower level before it will pass through the faucets 50. Even after the pressure has been dissipated it will not be possible to withdraw liquid from the faucets due to the fact that the atmospheric pressure is greater than the pressure existing in the casing 36. By opening one of the nozzles or faucets after the pump has been rendered inoperative, it will be possible to cause all of the liquid in the casing 36 to flow down through the tube 21 into the pipe 24 and into the tank 5. That is to say, the air will rush into the faucet that is open into the casing and will tend to force, or rather allow, the liquid to escape into the beverage supply tank. As the liquid is displaced the space will be filled up by the incoming air or air entering the casing through the faucet. Obviously, this inrush of air precludes any possibility of any measurable amount of fluid being discharged from the faucets.

Once a liquid seal has been established in the receptacle 32 by the level of the liquid overlapping the series of apertures 47, a constant level in the receptacle 32 will be maintained by the pump 14. The liquid will be constantly circulated through the receptacle 32 as well as through the coils 11 by the pump 14, but the level of the liquid in the container or receptacle 32 will not go beyond the constant level. This is also a highly desirable feature inasmuch as it makes the level of the beverage in the display receptacle 32 dependent upon the system rather than any human agency. Of course, it is to be understood that the maintenance of this constant level is, of necessity, dependent solely upon the operation of the impelling device or pump 14 for as soon as the pump ceases to function the level of the fluid in the receptacle 32 will drop.

It is evident from the foregoing description, that by stopping the pump 14 and opening one of the spigots 50 all of the beverage within the receptacle 32 may be caused to gravitate into the supply tank 5. This gravitation action may be expedited by removing the plug 41 from the aperture 40 and permitting the aperture to equalize the pressure within the receptacle 32. Incidentally, this means permits of the introduction of sliced fruit into the transparent receptacle for purposes of display.

I desire it understood that although I have described in detail the preferred embodiment of my invention that the invention is not to be limited thereby but only in so far as defined by the scope and spirit of the appended claims:—

1. In combination, in a liquid dispensing system, means for cooling the liquid, a transparent receptacle for containing a predetermined amount of liquid for purposes of display, and impelling means for circulating the fluid through the cooling means and the receptacle and for putting the liquid in the receptacle under a pressure greater than atmospheric pressure.

2. In combination, in a liquid dispensing system, cooling means, a receptacle associated therewith from which the liquid is dispensed, and a pump for contemporaneously forcing the liquid through the system including the cooling means and the receptacle and for putting the liquid in the receptacle under a pressure greater than atmospheric pressure.

3. In combination, in a liquid dispensing system, cooling means, a receptacle associated therewith from which the liquid is dispensed, a pump for contemporaneously forcing the liquid through the system including the cooling means and the receptacle and for putting the liquid in the receptacle under a pressure greater than atmospheric pressure, and means associated with the receptacle whereby the pressure therein may be made the same as atmospheric pressure to enable the liquid contained therein to be withdrawn more expeditiously when the pump is rendered inoperative.

4. In combination, in a liquid dispensing system, means for cooling the liquid, a transparent receptacle for containing a certain amount of liquid for purposes of display, impelling means for circulating the fluid through the cooling means and the receptacle and for putting the liquid in the receptacle under pressure, and means including an opening associated with the display receptacle for affording access thereto to change the pressure therein to atmospheric pressure and to enable fruit to be placed in the receptacle for purposes of display.

5. In combination, in a liquid dispensing system, a container, a cooling unit, means for circulating the liquid through the cooling unit and through the container, and means for causing the circulatory action to create a charge of liquid under pressure in the said container, the maintenance of the charge being dependent upon the circulation of the liquid.

6. In combination, in a liquid dispensing system, a container, a cooling unit, means for circulating the liquid through the cooling unit and through the container, means for causing the circulatory action to create a column of liquid under pressure in the said container, the maintenance of the column being dependent upon the circulation of the liquid, and means for causing the liquid to be discharged into the container in spray formation.

7. In combination, in a liquid dispensing system, a container, a plurality of telescoping tubes communicating with the said container, one tube being equipped with means for delivering liquid into the container in spray formation, another tube being adapted to convey liquid from the container, the influx being initially greater than the efflux until the liquid attains a predetermined level in the container, and means for circulating liquid through the system.

8. In combination, in a liquid dispensing system, a container, an impelling device, a first tube connecting the device to the container for delivering liquid thereto, a supply tank containing a source of liquid, a second tube connecting the tank to the container, said second tube being telescoped by the first tube and extending to a point above the first tube in the said container, a connection between the supply tank and the impelling device for enabling the impeller to circulate liquid through the system, and means including a plurality of openings in the tubes inside of the container for causing liquid to be discharged into the container in spray formation.

9. In combination, in a liquid dispensing system, a display container defined by a transparent wall, means including a tank containing a source of liquid, cooling means, impelling means for withdrawing liquid from the tank, circulating it through the cooling means, discharging it into the display container, and returning it to the said tank, and means for creating a column of liquid under pressure and of a predetermined height in the display container, the maintenance of the said column of liquid being dependent upon the operation of the impelling means.

10. In combination, a liquid trap having a restricted outlet, an impeller for circulating liquid through the trap and means for causing said circulatory action to control the withdrawal of liquid from the trap.

11. In combination, a liquid receptacle, a cooling zone associated therewith, impelling means for circulating the liquid through the receptacle and cooling zone, and means for utilizing the circulatory action to control the withdrawal of liquid from the receptacle.

12. In combination, a receptacle, means for circulating the liquid through the receptacle, and means for causing the circulatory action to maintain a charge of liquid under pressure in said receptacle.

13. In combination, a receptacle comprising a trap having a liquid inlet and a restricted outlet, dispensing means connected to the receptacle, a supply chamber for liquid, means for pumping liquid from the supply chamber to the liquid inlet into the receptacle and means for cooling the liquid pumped.

14. In combination, a receptacle having a liquid inlet and a restricted outlet, dispensing means connected to the receptacle, a liquid source of supply, means for pumping liquid from the supply through the liquid inlet into the receptacle, means for cooling the liquid pumped, and means for returning the liquid from the receptacle to the said supply.

15. In combination, a liquid trap, dispensing means associated therewith, a cooling unit, means for circulating liquid through the trap and cooling unit, and means for causing the dispensing of the liquid to be dependent upon the circulatory means.

16. In combination, a receptacle having a transparent portion and adapted to contain a charge of liquid for purposes of display, and impelling means for circulating liquid through the receptacle and compressing the air above the liquid in the receptacle to place the liquid charge therein under pressure.

17. In combination, a receptacle for holding a charge of liquid, impelling means for circulating liquid through the receptacle and compressing the air above the liquid charge in the receptacle to place the liquid therein under pressure, and means for causing said circulated liquid to be discharged into the container in spray formation.

18. In combination, a liquid receptacle having a restricted outlet, an impeller for forcing liquid into the receptacle to maintain a charge of liquid therein, means for causing said impeller to place the said charge under pressure, and means for causing the charge to immediately gravitate from the receptacle upon the stopping of the impeller to prevent liquid from being withdrawn from the receptacle.

19. In combination, an apparatus for maintaining a liquid in condition for dispensing, a trap holding liquid under pressure ready for dispensing, means for enabling the trapped liquid to be displaced at a rate commensurate with a change in the condition of the liquid, and means for restoring the condition of the trapped liquid by the introduction of properly conditioned liquid into the trap.

20. In combination, in an apparatus for maintaining a beverage in condition for dis-

pensing and consumption, a trap holding beverage under pressure ready for dispensing, means for depleting the dispensing pressure at a rate proportionate to change in temperature of the trapped beverage, and means for restoring the pressure by the introduction of chilled liquid into the trap.

21. In combination, in a liquid dispensing system, a liquid trap for holding liquid under pressure ready for dispensing, means for forcing liquid under pressure into the said trap to compress the gas above the liquid in the trap so as to enable the liquid to be withdrawn therefrom under pressure, and means for causing the trapped liquid to be dispensed at a given rate controlled by said first means.

In witness whereof, I hereunto subscribe my name this 4th day of March, 1926.

FRANK B. LOMAX.