

No. 831,939.

PATENTED SEPT. 25, 1906.

M. F. DEMING.  
PERCENTAGE MILK DILUTING VESSEL.

APPLICATION FILED JAN. 18, 1906.

2 SHEETS—SHEET 1.

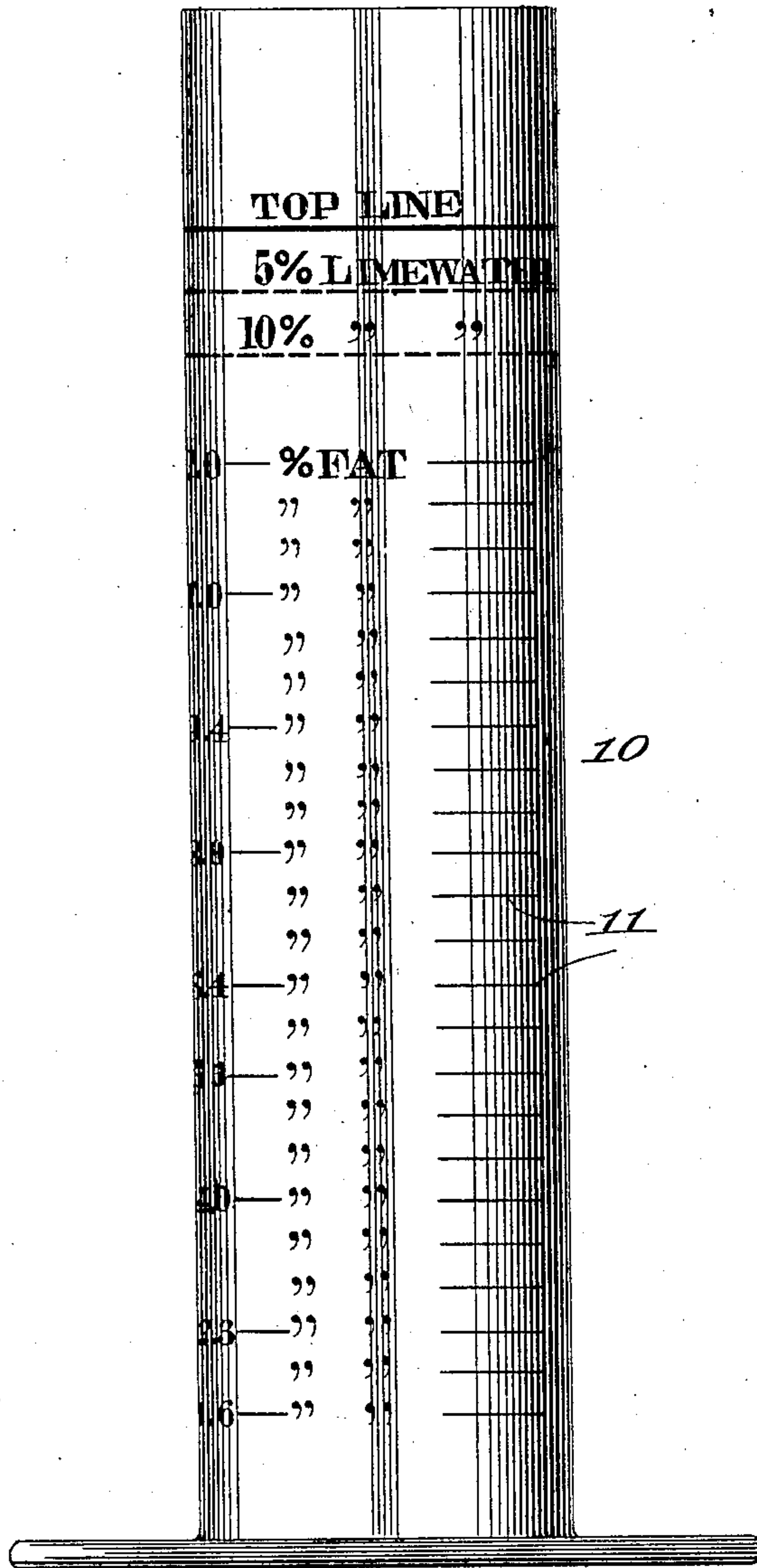


Fig. 1.

WITNESSES:

*Gustave Dietrich*  
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INVENTOR

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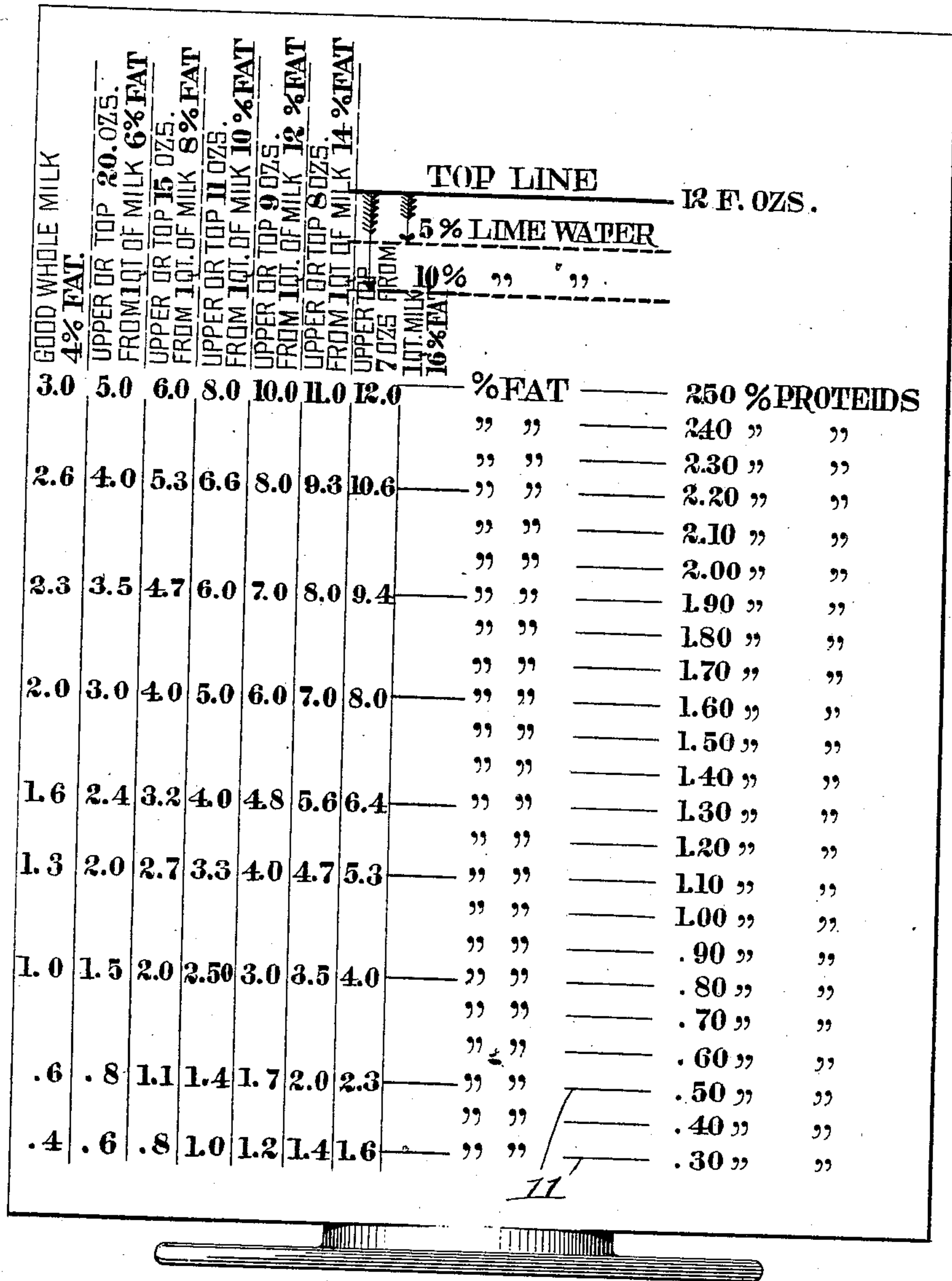


Fig. 2.

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# UNITED STATES PATENT OFFICE.

MACEY F. DEMING, OF TAPPAN, NEW YORK.

## PERCENTAGE MILK-DILUTING VESSEL.

No. 831,939.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed January 18, 1906. Serial No. 296,652.

*To all whom it may concern:*

Be it known that I, MACEY F. DEMING, a citizen of the United States, residing at Tappan, in the county of Rockland and State of New York, have invented a new and useful Percentage Milk-Diluting Vessel, of which the following is a specification.

My invention relates to a percentage milk-diluting vessel—that is, to a device for measuring the various quantities of whole milk, top milks, or creams and diluent that must be mixed together to produce mixtures containing different percentages of the proteids and fats of cow's milk.

The objects of my invention are to enable any one of ordinary intelligence to measure off the quantities of whole milk, top milks, or creams of approximately definite composition and diluent needed to be mixed together to give approximately any desired percentage of proteids and fats of cow's milk in the diluted whole milk, top milks, or creams and to make possible the ready increase or decrease of the percentages of proteids and fats in the diluted whole milk, top milks, or creams in known and fixed amounts by simply increasing or decreasing the quantities of the whole milk, top milks, or creams and diluent without the necessity of calculations or reference to tables or formulas to ascertain the amount or kind of milk, top milk, or cream and amount of diluent needed to be mixed together to provide the desired percentages.

In the accompanying drawings, Figure 1 is a side view of my percentage milk-diluting vessel, showing the graduations and a portion of the percentage-marks thereon. Fig. 2 is an extended view of the percentage-marks upon my percentage milk-diluting vessel.

In the drawings, 10 designates a vessel of transparent material having on the side thereof a column of horizontal graduation-lines 11, at the right of which and spaced correspondingly with said lines is a column of numerals expressing percentages coupled with the word "Proteids," said column of numerals being the percentage-proteid column, while at the left of the said column of graduation-lines 11 the side of the vessel bears a series of, in the present instance, seven parallel vertical columns of numerals expressing percentages of fat, the numerals in these columns being in line with some of the graduation-lines 11 which are in line with the numerals in the percentage-proteid column.

The numerals in the columns denoting percentages of fat are based upon the character of the milk employed in preparing the dilution, as indicated by the words, numerals, and marks upon the vessel above the respective columns, the percentages in the first column at the left of the series being based upon the use of good whole milk, which usually contains about four per cent. fat, the percentages given in the second column at the left of said series being based upon the use of milk containing six per cent. fat and conveniently obtained by taking the first twenty ounces from the top of a quart of good milk after the cream has risen thereon and thoroughly stirring the same, the percentages given in the third column at the left of said series being based upon the use of milk containing eight per cent. fat and conveniently obtained by taking the first fifteen ounces from the top of a quart of good milk after the cream has risen thereon and thoroughly stirring the same, the percentages given in the fourth column from the left of said series being based upon the use of milk containing ten per cent. fat and conveniently obtained by taking the first eleven ounces from the top of a quart of good milk after the cream has risen thereon and thoroughly stirring the same, the percentages given in the fifth column from the left of said series being based upon the use of milk containing twelve per cent. fat and conveniently obtained by taking the first nine ounces from the top of a quart of good milk after the cream has risen thereon and stirring the same, the percentages given in the sixth column from the left of said series being based upon the use of milk containing fourteen per cent. fat and conveniently obtained by taking the first eight ounces from the top of a quart of good milk after the cream has risen thereon and thoroughly stirring the same, and the percentages given in the seventh column from the left of said series being based upon the use of milk containing sixteen per cent. fat and conveniently obtained by removing the first seven ounces from a quart of good milk after the cream has risen thereon and thoroughly stirring the same. The vessel is also provided with a line denoting a fixed capacity or to which the milk and diluent must rise in obtaining the proper dilution, and this line is marked "Top line," below which I provide two graduation-lines denoting the quantity of lime-water which it may be desired to use in the dilution, one be-



ing marked "5%" and the other "10%." The top line in the drawings denotes a fixed capacity of twelve fluid ounces, and whatever capacity of vessel may be employed a top line or graduation denoting a fixed capacity with relation to the percentage - columns should be provided unless it is intended that the user should fill a vessel of fixed capacity to its brim with the milk and diluent, which would be inconvenient. The top line on my vessel therefore denotes the fixed capacity of the vessel with respect to the percentages marked thereon or the line to which the diluent must rise upon being added to the proper quantity of milk previously placed in the vessel if the desired dilution is to be obtained.

I do not confine my invention to the use on the side of the vessel of seven columns of percentages of fats, since the number of said columns may be increased or reduced, if desired; but since said vessel is intended to meet varied wants and conditions and be of universal utility in the field to which it pertains I prefer to make use of said seven columns of percentages of fats, with one column of percentages of proteids. The graduation-lines 11 are provided simply as a convenience to accurately guide the user in pouring the proper quantity of the milk into the vessel, it being better to provide the lines than to leave it to the user to determine or remember whether to pour in the milk until it reaches the lower edge or the middle or the upper edge of the proper percentage-numerals.

The column of percentages of proteids is always employed in connection with a column of percentages of fat, since every dilution should contain proper relative proportions of proteids and fats, and it is to be understood that the percentages given in the proteids and fat columns on the vessel denote not the percentages of proteids and fats that a quantity of milk filled up to the numerals in said columns might contain, but the percentages of proteids and fats such quantity of milk will impart to the final composition produced by adding to such quantity of milk a diluent sufficient to fill the vessel up to the limit of its capacity, or up to the top line. For instance, if a prescription should call for a dilution containing four per cent. fat and 1.30 per cent. proteids the user of my vessel would prepare his milk in accordance with the directions contained at the top of the fourth column from the left of the series of fat-columns and pour this prepared milk into the vessel until it filled up to the graduation-line in the column 11 alining with "4.0" in said fourth column and "1.30" in the proteid-column, and he would then pour into the vessel the diluent until the composition filled up to the top line. The vessel would then contain a diluted milk or composition containing from the milk ingredient four per cent. fat and 1.30 per cent. proteids. As a further

illustration, if a prescription should call for a dilution containing six per cent. fat and 1.90 per cent. proteids the user of my vessel would prepare his milk in accordance with the directions contained at the top of the fourth column from the left of the series of fat-columns and pour this prepared milk into the vessel until it filled up to the graduation-line in the column 11 alining with "6%" in said fourth column, "1.90%" in the proteid-column, and he would then pour into the vessel the diluent until the composition filled up to the top line. The vessel would then contain a diluted milk or composition containing, from the milk ingredient, six per cent. fat and 1.90 per cent. proteids. If, however, the prescription should have called for 6.4 per cent. fat and 1.30 per cent. proteids, the user of my vessel would prepare his milk in accordance with the directions contained at the top of the seventh column from the left of the series of fat-columns and pour this prepared milk into the vessel until it filled up to the graduation-line in the column 11 alining with "6.4%" in said seventh column and "1.30%" in the proteid-column, and he would then pour into the vessel the diluent until the composition filled up to the top line. The vessel would then contain a diluted milk or composition containing, from the milk ingredient, 6.4 per cent. fat and 1.30 per cent. proteid.

From the foregoing illustrations it will be understood that a great many different combinations of proteids and fats of cows' milk may be accurately measured by means of the vessel presented herein and accurate dilutions prepared accordingly, the said vessel serving as a measure for the varied characters of milk (varying in percentage of fat) in proportion to the percentages of proteids desired and fixing the quantity of diluent which must be combined with the milk to obtain in the final composition or dilution the prescribed or predetermined relative proportions of fats and proteids which the same must contain, whereby the user of the vessel is enabled to readily and accurately prepare the diluted compositions without possessing special knowledge and without having to engage in mathematical calculations as to the relative proportions of fats and proteids in the various characters of milks and in relation to the quantity of the diluted composition to be prepared.

It having been decided what percentages of proteids and fats of cows' milk it is desired to have in the dilute product, inspection of the heading of the column containing the desired percentage of fat opposite desired percentage of proteid shows what kind of milk is to be used. This milk is then poured into the percentage milk-diluting vessel up to the graduation opposite the desired percentage of proteids, and the diluent is then added up to



the top line, unless it is desired to make five per cent. or ten per cent. of the dilution consist of lime-water, when the diluent is added only to the lime-water graduations and lime-water is then added up to the top line.

The percentages opposite the graduations in the drawings are based on whole milk containing about 3.20 per cent. proteids and four per cent. fat (Van Slyke) and top milks containing six per cent., eight per cent., ten per cent., twelve per cent., fourteen per cent., sixteen per cent. fat, and 3.20 per cent. proteids; but they may be adjusted to milk and top milks of any other compositions.

Milks of fixed-percentage compositions may be bought of milk dealers or they may be quite readily obtained in the home from a one-quart bottle of milk of good quality by the following method: If milk is placed in the ordinary quart milk-bottles and kept cool, at least below 60° Fahrenheit, the cream or fat at once commences to rise and soon appears as a distinct layer. If the milk is bottled immediately after milking, the cream will have risen quite completely in four hours; but milk that has been standing in bulk for some time and is then bottled does not cream so rapidly. However, in the bottled milk as delivered to families the cream generally has risen when the milk is delivered, so it can be used without waiting or delay. There are then about seven ounces of cream containing about sixteen per cent. fat and 3.20 per cent. proteids in the upper part of a quart bottle of good whole milk, which contains about four per cent. fat and 3.20 per cent. proteids before the cream has risen. The proteids do not separate as the fat or cream does. By removing and adding to this creamy layer the remaining skim-milk, or what is practically fat-free milk, an ounce at a time milks containing twenty-six different proportions between fats and proteids may be readily obtained from one quart of milk. These mixtures of the creamy layer and the remaining or skim milk are called "weak creams" or "top milks" and may be easily and accurately removed from a one-quart milk-bottle by a one-ounce dipper—the Chapin dipper, which is widely used for this purpose. A quart of milk originally containing four per cent. fat will yield, after the cream has risen, about seven ounces sixteen per cent. fat, eight ounces fourteen per cent., nine ounces twelve per cent., ten ounces eleven per cent., eleven ounces ten per cent., twelve ounces 9.5 per cent., thirteen ounces nine per cent., fourteen ounces 8.4 per cent., fifteen ounces 7.8 per cent., sixteen ounces 7.5 per cent., seventeen ounces seven per cent., eighteen ounces 6.6 per cent., nineteen ounces 6.3 per cent., twenty ounces six per cent., twenty-one ounces 5.8 per cent., twenty-two ounces 5.6 per cent., twenty-three ounces 5.3 per cent., twenty-four

ounces 5.1 per cent., twenty-five ounces five per cent., twenty-six ounces 4.8 per cent., twenty-seven ounces 4.6 per cent., twenty-eight ounces 4.4 per cent., twenty-nine ounces 4.3 per cent., thirty ounces 4.2 per cent., thirty-one ounces 4.1 per cent., or thirty-two ounces four per cent. fat if the skim-milk contains 0.6 per cent. fat, each of which contains about 3.20 per cent. proteids. When the skim-milk contains as high as one per cent. fat, the percentages given above will vary slightly, but not enough to make any practical difference.

Having described my invention and how it is used, what I claim as new therein, and desire to secure by Letters Patent, is—

1. A percentage milk-diluting vessel of fixed capacity having thereon a column of expressed percentages of proteids and a column of expressed percentages of fats, the numerals of one column alining with the numerals in the other column and the sets of numerals indicating by their position the line to which the vessel must be filled with a special grade of milk to impart to the total composition formed by combining therewith sufficient diluent to fill the vessel to its fixed capacity, the indicated relative percentages of fats and proteids.

2. A percentage milk-diluting vessel of fixed capacity having thereon a column of expressed percentages of proteids and a plurality of columns of expressed percentages of fats, the successive numerals in said columns being arranged in horizontal alinement with one another and those in the several fat-columns being respectively arranged for different grades of milk, and the sets of numerals in the fat and proteid columns indicating by their position the line to which the vessel must be filled with milk, according to the grade used, to impart to the total composition formed by combining therewith sufficient diluent to fill the vessel to its fixed capacity, the indicated relative percentages of fats and proteids.

3. A percentage milk-diluting vessel of fixed capacity having thereon a column of expressed percentages of proteids, a column of expressed percentages of fats and a column of horizontal parallel graduation-lines intermediate said percentage-columns and in alinement with the numerals therein, the alined sets of numerals in said columns indicating by their position, with said lines serving as accurate guides, the line to which the vessel must be filled with a special grade of milk to impart to the total composition formed by combining therewith sufficient diluent to fill the vessel to its fixed capacity, the indicated relative percentages of fats and proteids.

4. A percentage milk-diluting vessel of fixed capacity having thereon a column of expressed percentages of proteids, a plurality of columns of expressed percentages of

fats arranged for different grades of milk, and indicia above the respective fat-percentage columns denoting the grades of milk to which the numerals in said columns pertain, 5 the successive numerals in said proteid and fat columns being arranged in horizontal alinement with one another and indicating by their position the line to which the vessel must be filled with milk, according to the grade used, to impart to the total composition formed by combining therewith sufficient diluent to fill the vessel to its fixed capacity, the indicated relative percentages of fats and proteids.

MACEY F. DEMING.

Witnesses:

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