(No Model.)

J. V. DIVIS.

SPECIFIC GRAVITY APPARATUS.

No. 465,841. Patented Dec. 29, 1891.

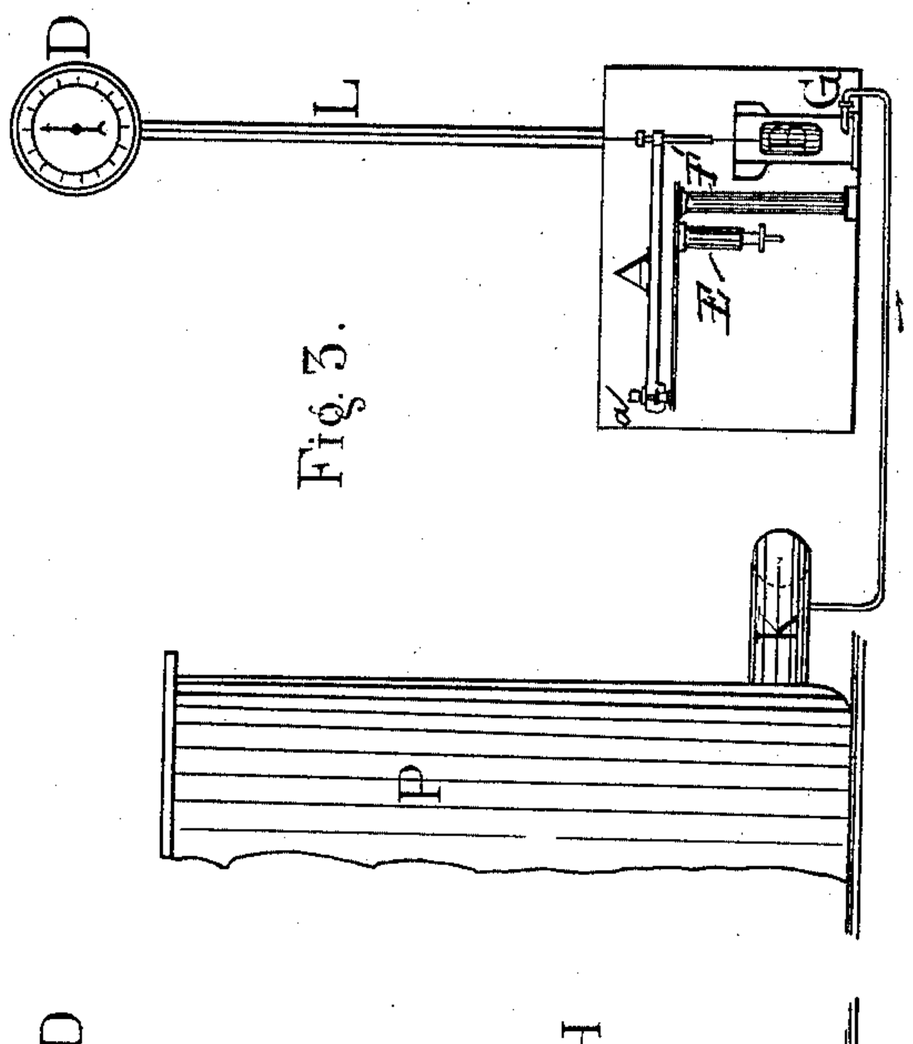

Fig. 3.

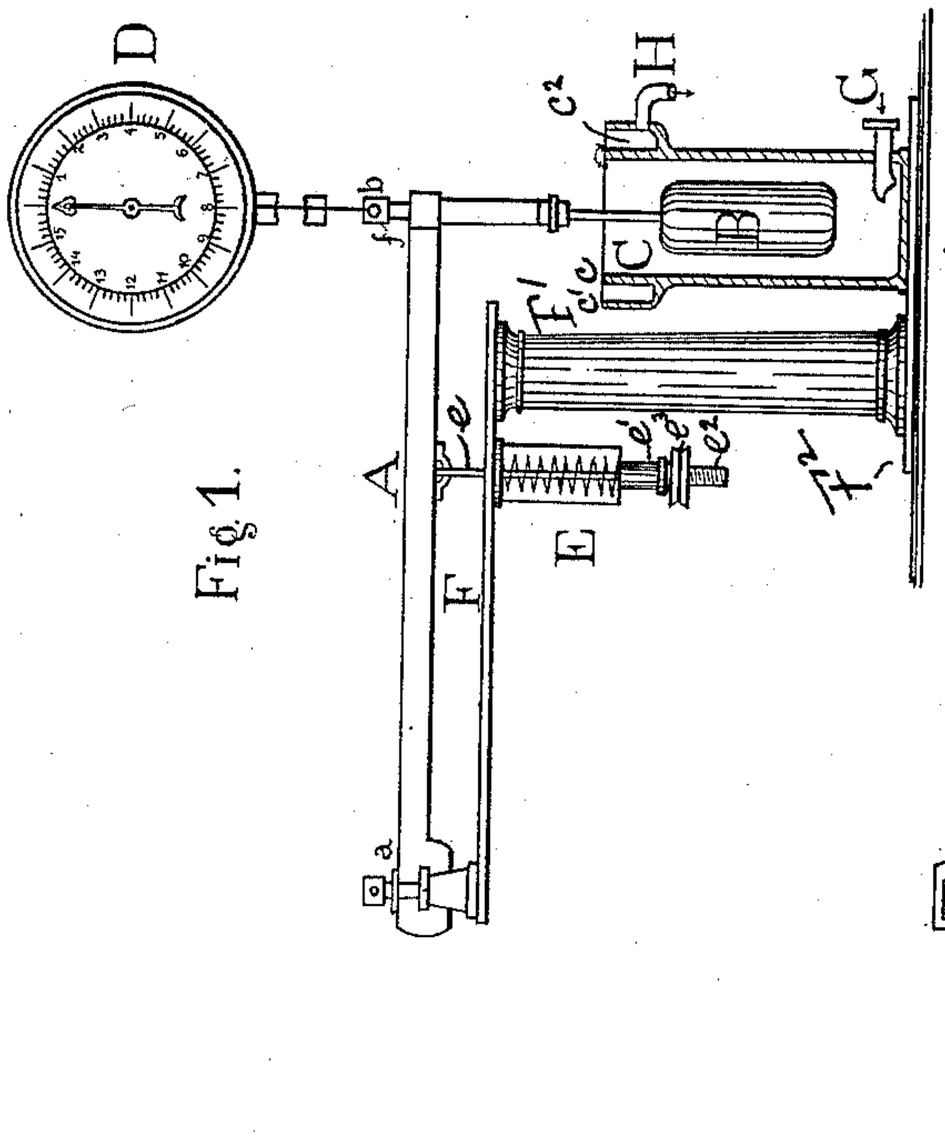

Fig. 1.

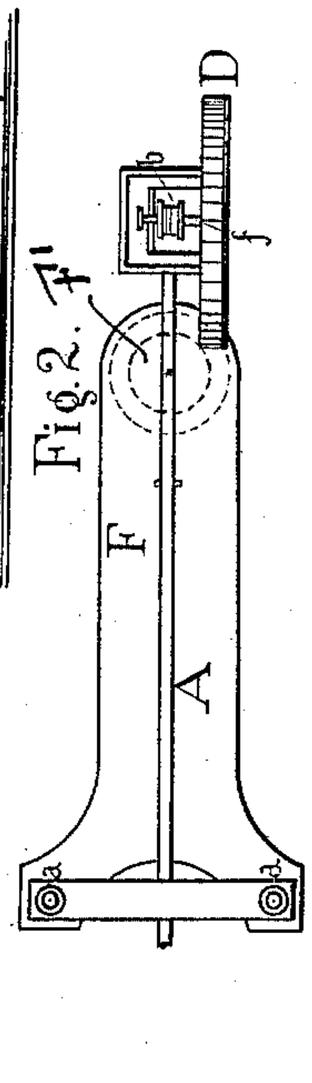

Fig. 2.

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UNITED STATES PATENT OFFICE.

JAN VINCENC DIVIS, OF PRELONC, AUSTRIA-HUNGARY.

SPECIFIC-GRAVITY APPARATUS.

SPECIFICATION forming part of Letters Patent No. 465,841, dated December 29, 1891.

Application filed July 18, 1889. Serial No. 317,955. (No model.)

To all whom it may concern:

Be it known that I, JAN VINCENC DIVIS, a subject of the Emperor of Austria, residing at Prelonc, Bohemia, Austria, have invented a Specific-Gravity Apparatus, of which the following is a full, clear, and exact description.

The object of my invention is the construction of an apparatus especially adapted for use in large establishments for indicating continually the density of liquids in a more satisfactory and practical way than is now done. The present aerometers and similar instruments do very well for laboratory or home use; but for large establishments, where the observer is exposed to the radiant heat or to noxious gases, steam, and vapors, &c., of the liquids, the management of densimeters is tiresome and in many cases quite unsatisfactory. My new densimeter, which I call "bareoscope," indicates the density of liquids continually, exactly, and so that it can be observed from a distance, or it can be arranged as to even record and write automatically the density of the liquid upon strips of paper.

In carrying out my invention I employ a float in a reservoir which has always the same level, said float being carried by a lever which is partly supported by a spring or weight for the sake of regulating the same. The end of said lever is connected with a string, chain, or any other flexible band, which is wound around the spindle of a pointer which is continually drawn backward by a spiral spring or weight. The pointer indicates the density upon a dial, or it may be arranged in a similar way, as in the well-known meteorological or other instruments in connection with clockwork for the purpose of recording the density upon strips of paper or otherwise.

In the annexed drawings, Figure 1 is a front view of the bareoscope. Fig. 2 is a plan view of the same, and Fig. 3 shows the arrangement of the bareoscope in a sugar manufactory.

B is the float, which is preferably a hollow and water-tight metallic body. This float is carried at one end of a lever A, which is pivoted at *a* and supported on an arm F, carried by a standard F′, which rests upon a bed-plate F^2. The float B is suspended within a reservoir C, which may also be arranged upon the bed-plate F^2. The reservoir C is constructed with a double top *c c′*, with an interposed annular channel c^2, extending around the reservoir C, substantially as shown, and having an outlet-cock H for discharging the liquids, as will be more fully explained hereinafter. An inlet-pipe G is also constructed in the bottom of the reservoir. The lever A is further arranged to be held in place by a spring E, (or its equivalent, a counter-weight,) and to this end I attach to the lever A a rod *e*, which may be done as shown or in any other suitable way. A slot or other opening is made at a suitable place in the arm F to admit of the passage of this rod. The bottom end of the rod *e* is screw-threaded, as at e^2, and carries a washer *e′* and a screw-thimble e^3. The spring E is interposed between the bottom of the arm F and the washer *e′*, one end of the spring being secured to the washer *e′* and the other end to the arm F. The lever A is thus spring-balanced, and the tension of the spring and its corresponding action upon the lever A may be regulated by turning the screw-thimble e^3, which is swiveled upon the washer *e′*, either one way or the other.

D is a dial having a pointer mounted upon a spindle. The pointer is kept to its place upon the zero by a spring or counter-weight in the usual manner. A string, wire, chain, or other flexible connection is wound around the spindle of a pointer and connected thereto at one end, while its opposite end is connected to the end of the lever A, so that every movement of the lever A will be transmitted to the spring-controlled pointer of the dial. This form of construction is well known and need not be described here.

The operation of my apparatus is as follows: The liquid to be measured is conducted through the pipe G to the reservoir C, where it rises up against and around the float B, overflowing the lip *c* into the annular channel c^2, whence it is discharged through the pipe H. An increase in the specific gravity of the liquid causes the float B to rise, and as said float is rigidly connected to the lever A the latter will rise with it, compressing the spring E and moving the pointer of the dial through the intermediate action of the connecting-wire which passes around its spindle. As the pressure of the liquid against the float B varies in proportion to its density, the float

B will be raised and the pointer of the dial will be moved to a greater or less extent in exact proportion to the density of the liquid being measured, and the dial being subdivided into numbered degrees the pointer will constantly show upon the dial the exact degree of density of the liquid passing through the reservoir C. It should be observed that the reservoir C should always be kept at the same level. The dial is always perfectly visible and allows of a minute subdivision, such as could never be observed upon the densimeters now in use. These divisions are regulated for an average temperature, and corrections can be made by regulating the spring E by means of its screw, &c. In case of the necessity for corrections for different temperatures it is necessary to measure the temperatures in an appropriate way and calculate the corrections. Otherwise these corrections may be effected automatically by means of a metallic piston thermometer, which should be mounted so as to influence the tension of the spring E and to regulate the same.

Fig. 3 shows an arrangement of a bareoscope in a sugar manufactory. P is a factory reservoir containing the liquid. The bareoscope is inclosed in a casing, being connected with P by means of a pipe or tube passing from K to the inlet-pipe G. The dial D on the top of the tube L is mounted above said casing. The wire which connects the lever A with the pointer passes through the tube L. The casing may be locked, if desirable.

The division of the dial and the proportions of different parts, as well as the special construction of them, may be varied to suit the different special industries in which the bareoscope is to be used, just as it is the case with other densimeters, without departure from the chief features of my invention, and it should therefore be understood that I do not limit myself to the precise construction of the several parts of the apparatus as herein described.

What I claim as new, and desire to secure by Letters Patent, is—

In a specific-gravity apparatus, the combination, with the receptacle for containing liquids, of a float in said receptacle, a lateral supporting-arm F, having at its outer end the fulcrum or pivot *a*, a lever-arm A, mounted at its outer end on said pivot, extending over said receptacle and connected with said float, an indicating-dial having its pointer connected with said lever-arm, a rod *e*, attached to the lever-arm and having a screw-thread, a nut or screw-thimble engaging the latter, and a spring E on said rod and interposed between the arm F and said thimble, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JAN VINCENC DIVIS.

Witnesses:
LADISLAV VOJAIECZ,
FAEALE PLESCHEY.