

separated, and an article nearly white and inodorous is obtained. Some of the cakes of American Caoutchouc exhale when cut the fœtor of rotten cheese; a smell which adheres to the threads made of it, after every process of purification.

In the interior of many of the balls which come from both the Brazils and East Indies, spots are frequently found of a viscid, tarry-looking matter, which, when exposed to the air, acts in some manner as a ferment, and decomposes the whole mass into a soft substance, which is good for nothing. Were the plan of boiling the fresh juice along with its own bulk of water, or a little more, adopted, a much purer article would be obtained, and with incomparably less trouble and delay, than has been hitherto brought into the market.

I find that neither of the above two samples of caoutchouc juice affords any appearance of coagulum when mixed in any proportions with alcohol of 0.825 specific gravity; and, therefore, I infer that albumen is not a necessary constituent of the juice, as Mr. Faraday inferred from his experiments published in the 21st vol. of the Journal of the Royal Institution.

The odour of Mr. Sievier's sample is slightly acescent, that of Mr. Beale's, which is by far the richer and purer, has no disagreeable smell whatever. The taste of the latter is at first bland and very slight, but eventually very bitter, from the aloetic impression upon the tongue. The taste of the former is bitter from the first, in consequence of the great excess of aloes which it contains. When the brown solution which remains in the capsule, after the caoutchouc has been separated in a spongy state by ebullition, from 100 grains of the richer juice, is passed through a filter and evaporated, it leaves 4 grains of concrete aloes.

Both of these emulsive juices mix readily with water, alcohol, and pyroxilic spirit, though they do not become at all clearer; they will not mix with *caoutchoucine* (the distilled spirit of caoutchouc), or with petroleum-naphtha, but remain at the bottom of these liquids as distinct as mercury does from water. Soda caustic lye does not dissolve the juice; nitric acid (double aquafortis) converts it into a red curdy magma. The filtered aloetic liquid is not affected by the nitrates of baryta and silver; it affords with oxalate of ammonia minute traces of lime.

In a continuation of this paper I shall lay before your readers, next month, several interesting facts concerning the manufacture of caoutchouc on the great scale, supplementary to the account given in my Dictionary of Arts, &c.

Jour. Arts and Sciences.

February 18, 1839.

### *Hydrostatic Weighing Machine.* By CAPTAIN ERICSSON.

The object of this invention is that of dispensing with the use of weights, in all ordinary weighing in which ounces are not counted. The principal features are:

1. That the instrument is not subject to any friction; hence, that its accuracy is not, like the balance, affected under heavy weights.
2. That the motion of the parts is almost imperceptible, wear and tear being thereby prevented.
3. That the weight may be read off the moment the article is suspended.
4. That by suspending the instrument in the ordinary hoisting tackles,

the precise weight of goods, &c. may be obtained by the very process of loading or unloading.

The annexed drawing, represents a section of the model.

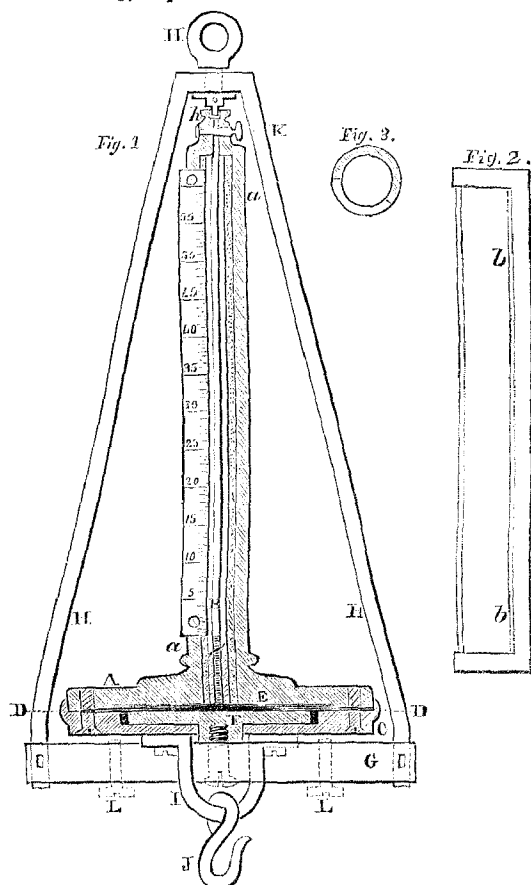


Fig. 1. A is a shallow inverted box of cast iron, with a hollow stem *a, a*; into this stem is inserted a glass tube B, bedded in plaster of Paris. C is a plate of cast-iron with a wide recess in it, firmly secured to the box A, a piece of India rubber cloth D, D, being inserted between them, so as to form a tight joint. E is a small quantity of mercury contained in the box A, and resting on the India rubber cloth D, D; this being supported by, and fixed to, a plate or piston F. This plate rests on, and is firmly attached by a screw to, the under cross-bar G; and this bar is suspended by two rods H, H, and the swivel eye-bolt H, which is partly inserted into, and made to slide in, the stem *a, a*, at *h*. I is a loop fixed to the bottom of the plate C, without touching the cross-bar G; it has a hook J correctly under the centre, to which hook the article to be weighed is suspended. K is a small stop-cock, which may be shut whenever the instrument is not in use; it will prevent any mercury from escaping when moving the instrument, or should it chance to be placed in a horizontal position.

Rather more than one quarter of the circumference of the stem *a, a*, is cut away, to show the tube, and let the rise of the mercury be seen, the index-plate is screwed to one side of the opening. Though the glass tube is protected by nearly three-quarters of the stem *a*, yet a further security is provided for it when out of use. A tube like fig. 2, and 3 its section, is slid over the stem before the index-plate is screwed on: this slides round one way, to show the glass tube through its side-opening, and back again, till its margin *b, b*, comes against the index-plate, and shuts the glass tube quite up.

The plate *F*, with the mercury on it, is supported by the rods and eye-bolt, *H*. The weights of the stem, *a, a*, with all its parts, the plates *A* and *C*, the loop and hook, *I, J*, are always floating on the mercury; which, in consequence, rises in the tube to balance them. From this surface the number on the index begins. All articles to be weighed are, through the hook *J*, supported from the plate *A*, which causes it to press so much more on the mercury, and drive it up the tube enough to balance the weight appended.

It may be convenient to place two adjusting, or safety screws *L, L*, in the bar *G*, the upper ends of which shall stand high enough to prevent the plate *c* from descending so low as to spill the mercury over the top of the tube *B*, should any article be hung on whose weight exceeded the range of the instrument.

The limit of the power of the instrument for weighing will depend on the diameter of the piston and box, and the length of the glass tube; thus, for instance, a piston and box of about 16 inches in diameter, with a tube of 3 feet, would weigh above 3600 lbs. It is worthy of notice, that the greatest motion of the piston in an instrument of this size will only amount to  $\frac{1}{100}$ th of an inch.

The effect of changes in the temperature will, evidently, be an increase or diminution of the specific gravity of the mercury: this will, however, not affect the accuracy of the indication, for, though the mercury dilates more than the materials of which the box and piston are composed, still it can only affect the indication in a direct proportion to its expansibility; whereas the dilatation of the box and piston will counteract in proportion to the square of their expansibility. A slight error in the indication still remains, which will be completely corrected by fixing the index-plate at its lower end only, allowing the top free motion during changes of temperature. Regarding the construction of this instrument, it is of importance to make the bore of the glass tube, in all cases,  $\frac{3}{16}$ th of an inch, and the space between the circumference of the piston and the box should never exceed that dimension, however large the instrument may be.

Trans. Soc. Encour. Arts.

#### *A Resonant Spring for Table Clocks.* By HENRY MAPPLE.

It is common in table-clocks, in order to get a deeper sound than is given by such bells as can conveniently be attached to them, to substitute for a bell a resonant spiral steel spring, which, when well made, will give a deep-toned, musical vibration when struck. In the French clocks the resonant spring is thin, and is fixed to the case by the centre or inner end, the case itself being made of maple, or some light wood. The sound given by the spring under these circumstances is very good, but such cases are liable to split in tropical climates. A considerable demand for such clocks exists in