PHILOSOPHICAL TRANSACTIONS.

Munday, *Feb.* 12. 166⅘.

The Contents.

An Appendix *to the* Directions *for Seamen, bound for far Voyages.*

WHereas it may be of good uſe, both *Naval* and *Philoſophical*, to know, both how to ſound depths of the ſea *without a Line*, and to fetch up water from any depth of the ſame; the following waies have been contrived by Mr. *Hook* to perform both; (which ſhould have been added to the lately printed *Directions for Seamen*, if then it could have been conveniently done.)

Firſt, for the ſounding of depths without a Cord, conſider *Figure* 1, and accordingly take a Globe of *Firr*, or *Maple*, or other light Wood, as A: let it be well ſecured by Verniſh, Pitch, or otherwiſe, from imbibing water; then take a piece of Lead or Stone, D, conſiderably heavier then will ſink the Globe: let there be a long Wire-ſtaple B, in the Ball A, and a ſpringing Wire C, with a bended end F, and into the ſaid ſtaple, preſs in with your fingers the ſpringing Wire on the bended end: and on it hang the weight D, by its ring E, and ſo let Globe and all ſink gently into the water, in the poſture repreſented in the firſt *Figure*, to the bottom, where the weight D touching firſt, is thereby ſtopt; but the Ball, being by the *Impetus*, it acquired in deſcending, carried downwards a little after the weight is ſtopt, ſuffers the ſpringing wire to fly back, and thereby ſets it ſelf at liberty to reaſcend. And, by obſerving the time of the Ball's ſtay under water (which may be done by a Watch, having minuts and ſeconds, or by a good Minut-glaſs, or beſt of all, by a Pendulum vibrating ſeconds) you will by this way, with the help of ſome *Tables*, come to know any depth of the ſea.

Note, that care muſt be had of proportioning the weight and ſhape of the Lead, to the bulk, weight, and figure of the Globe, after ſuch a manner, as upon experience ſhall be found moſt convenient.

In ſome of the Tryals already made with this Inſtrument, the Globe being of Maple-wood, well covered with Pitch to hinder ſoaking in, was $5\frac{13}{16}$ inches in diameter, and weighed $2\frac{1}{2}$ pounds: the Lead of $4\frac{1}{2}$ pounds weight, was of a *Conical* figure, 11. inches long, with the ſharper end downwards, $1\frac{5}{16}$ inches at the top, and $\frac{1}{16}$ at the the bottom in diameter. And in thoſe Experiments, made in the *Thames*, in the depth of 19. foot water, there paſſed between the Immerſion and Emerſion of the Globe, 6. ſeconds of an hour; and in the depth of 10. foot water, there paſſed $3\frac{1}{2}$ ſeconds or thereabout: From many o which kind of Experiments it will likely not be hard to find

out

out a method to calculate, what depth is to be concluded from any other time of the like Globes ſtay under water.

In the ſame Tryals, made with this Inſtrument in the ſaid River of *Thames*, it has been found, that there is no difference in time, between the ſubmerſions of the Ball at the greateſt depth, when it roſe two Wherries length from the place where it was let fall (being carried by the Current of the *Tide*) and when it roſe within a yard or ſo of the ſame place where it was let down.

The *other* Inſtrument, for Fetching up water from the depth of the ſea, is (as appears by *Figure* 2.) a ſquare woodden *Bucket* C, whoſe bottoms *EE*, are ſo contrived, that as the weight A, ſinks the Iron B, (to which the Bucket C, is faſtned by two handles DD, on the ends of which are the moveable bottoms or Valves EE,) and thereby draws down the Bucket; the reſiſtance of the water keeps up the Bucket in the poſture C; whereby the water hath, all the while it is deſcending, a clear paſſage through; whereas, as ſoon as the Bucket is pulled upwards by the Line F, the reſiſtance of the water to that motion beats the Bucket downward, and keeps it in the poſture G, whereby the Included water is preſerved from getting out, and the Ambient water kept from getting in.

By the advantage of which Veſſel; it may be known, whether ſea water be Salter at and towards the bottom, then at or near the top: Likewiſe, whether in ſome places of the ſea, any ſweet water is to be found at the bottom; the *Affirmative* whereof is to be met with in the *Eaſt Indian* Voyages of the induſtrious *John Hugh Van Linſchoten*, who page 16 of that Book, as 'tis *Engliſhed*, records, that in the *Perſian Gulph*, about the Iſland *Barem*, or *Baharem*, they fetch up with certain Veſſels (which he deſcribes not) water out of the ſea, from under the ſalt-water, four or five fathom deep, as ſweet, as any Fountain water.

Fig. 1

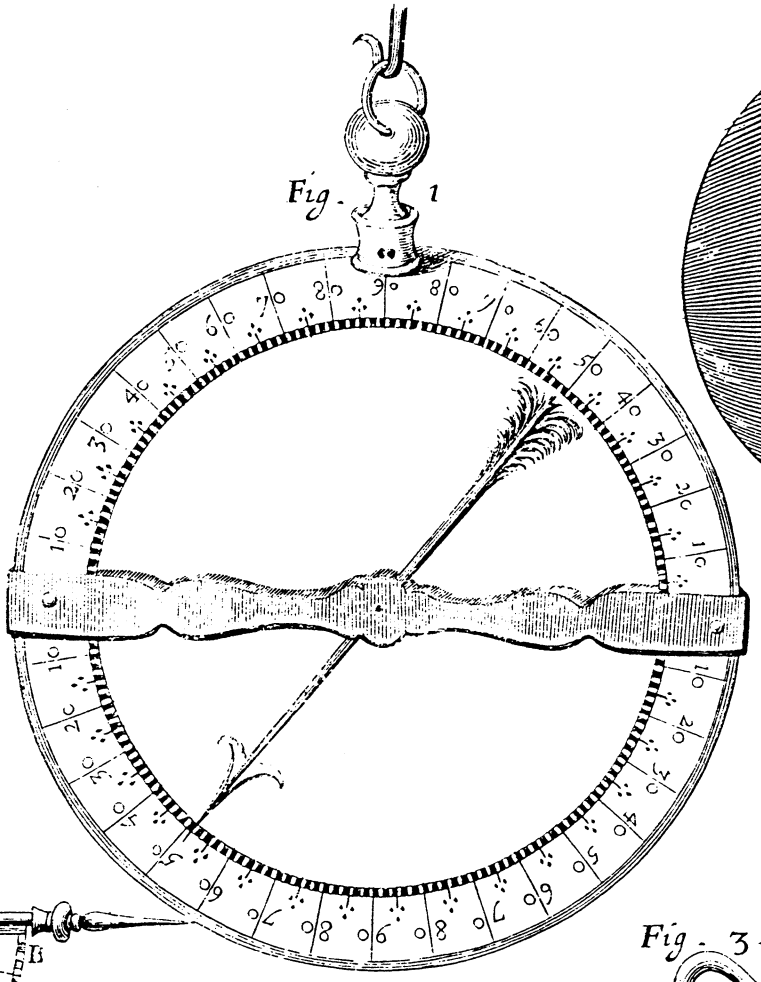


Fig. 2

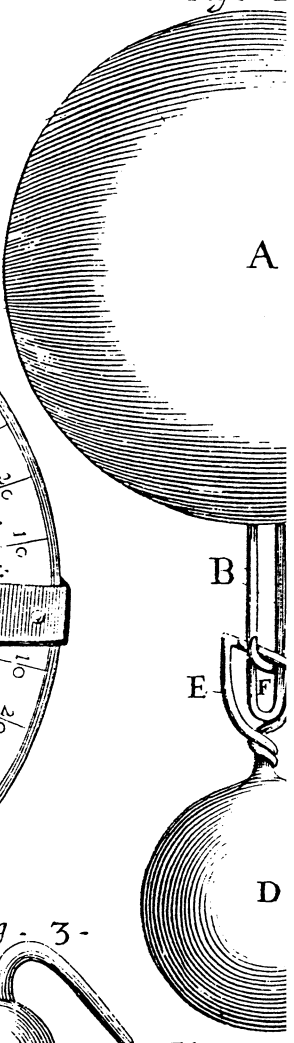


Fig. 3.

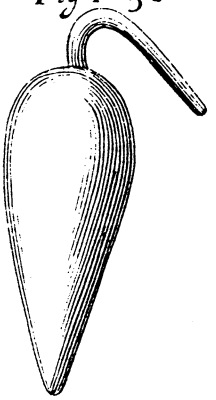


Fig. 4.

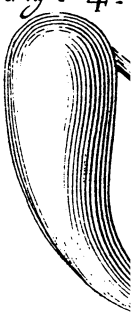
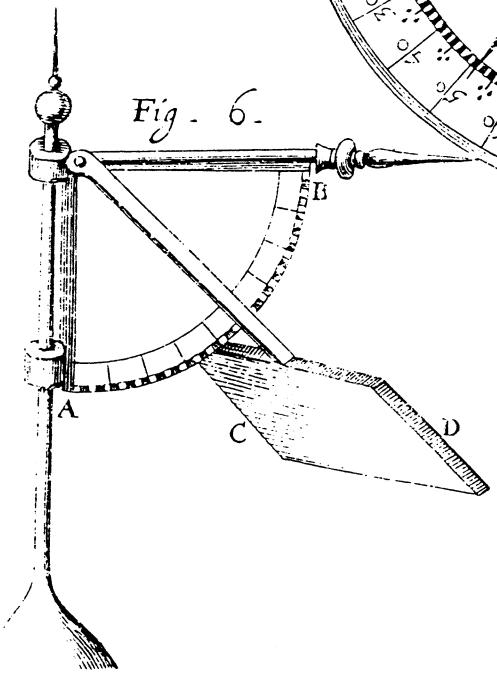


Fig. 6.



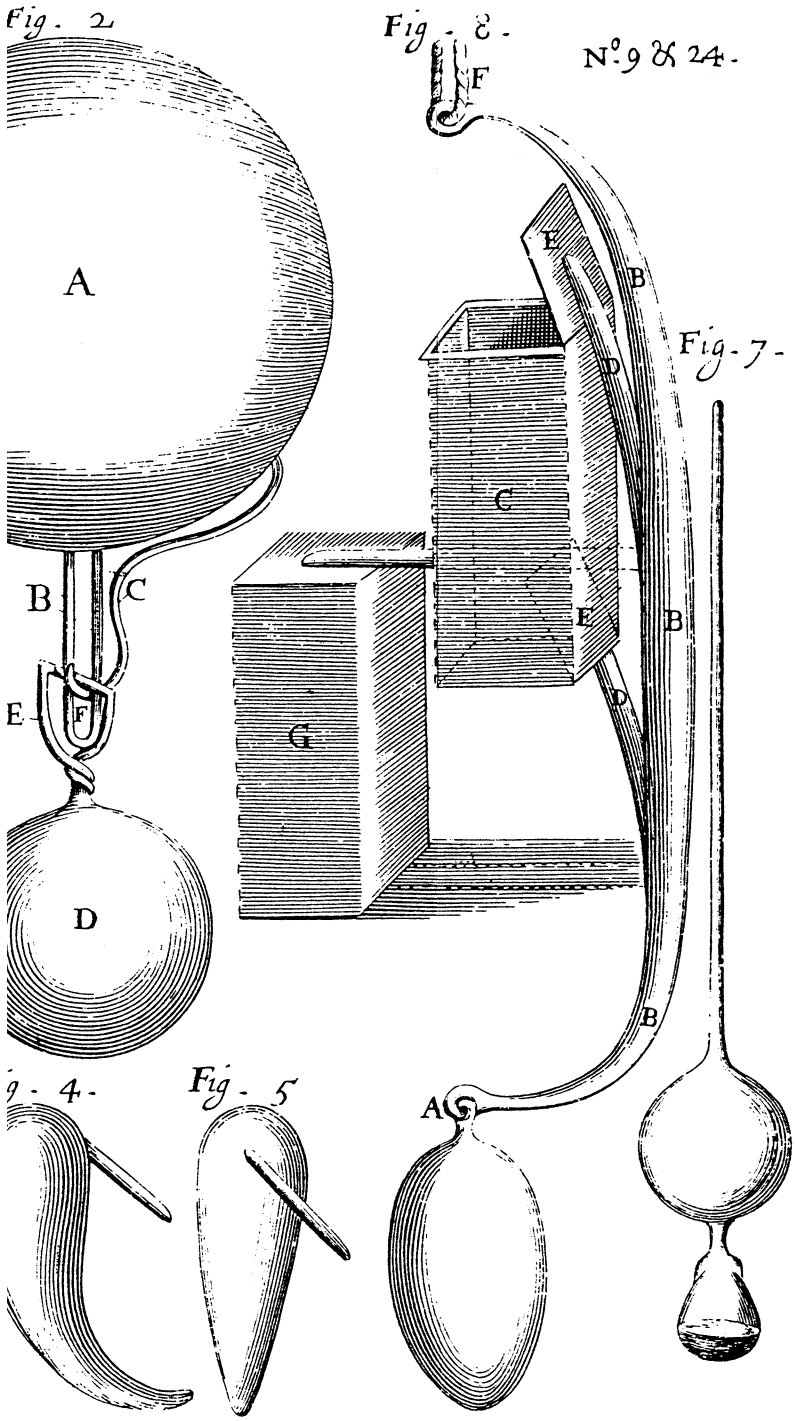


Fig. 2
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D
Fig. 8.
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Fig. 7.
Fig. 4.
Fig. 5

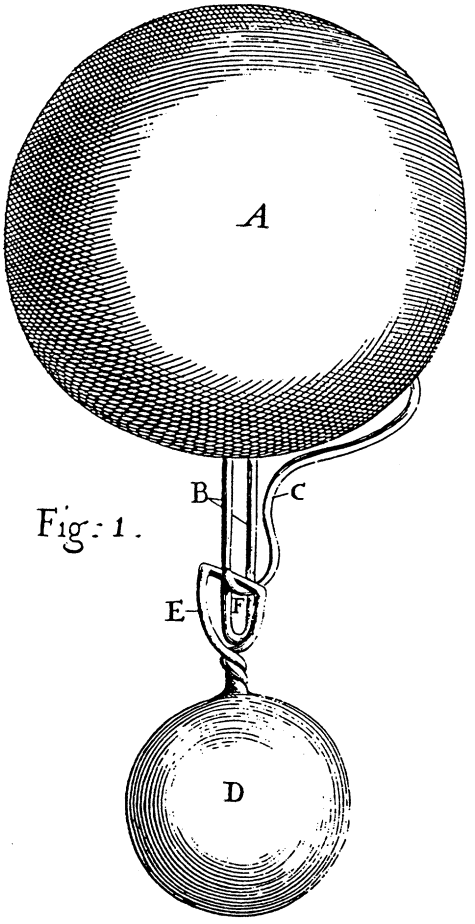

Fig: 1.

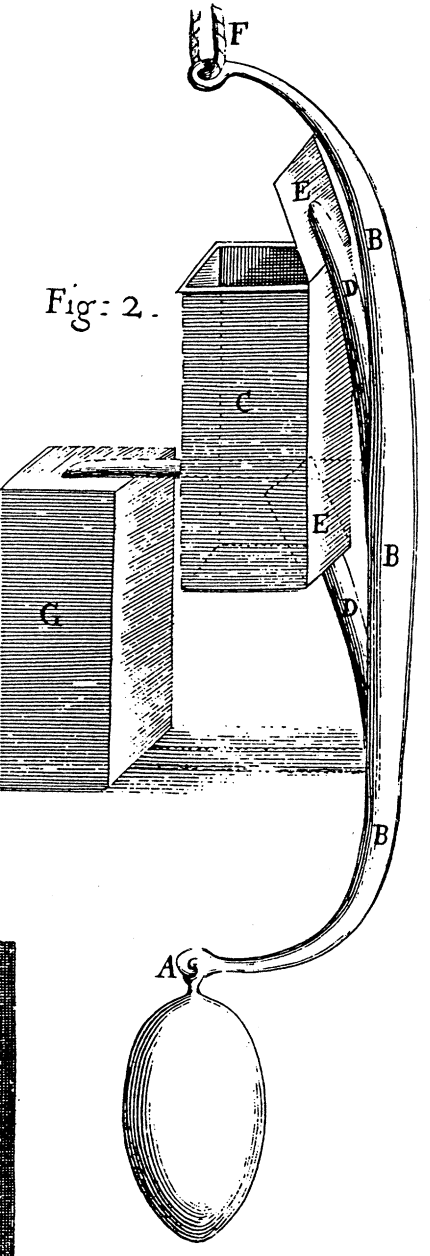

Fig: 2.

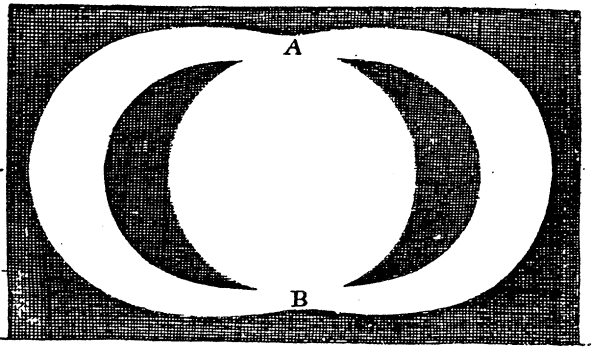

Fig: 3.

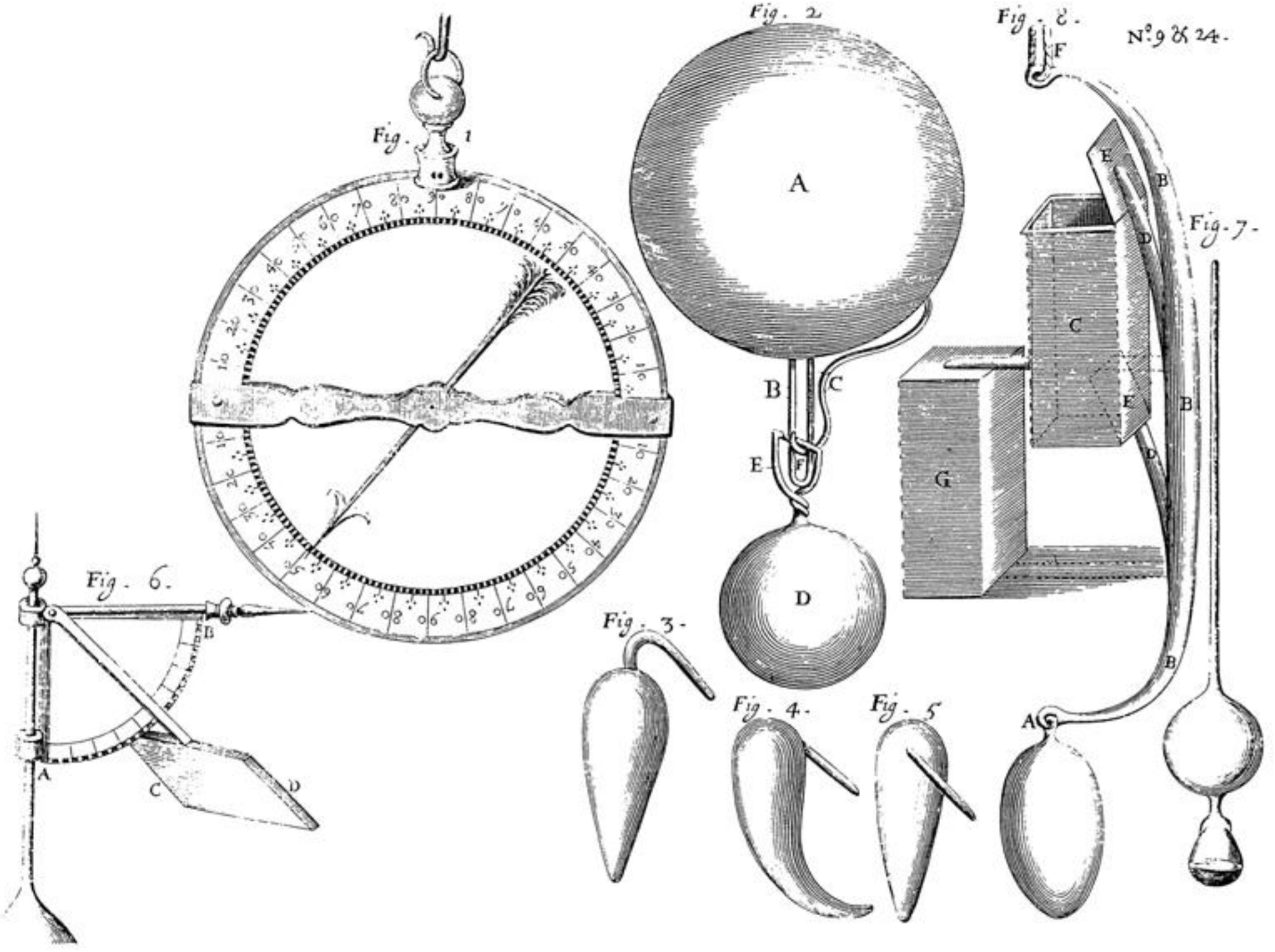
Fig. 1
Fig. 2
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B
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Fig. 8.
F
N°9 & 24.
Fig. 7.
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G
Fig. 6.
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Fig. 3.
Fig. 4.
Fig. 5
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