No. 731,959. PATENTED JUNE 23, 1903.

H. M. SHEER.

REGULATOR DISK.

APPLICATION FILED JULY 23, 1902.

NO MODEL.

Fig. 1.

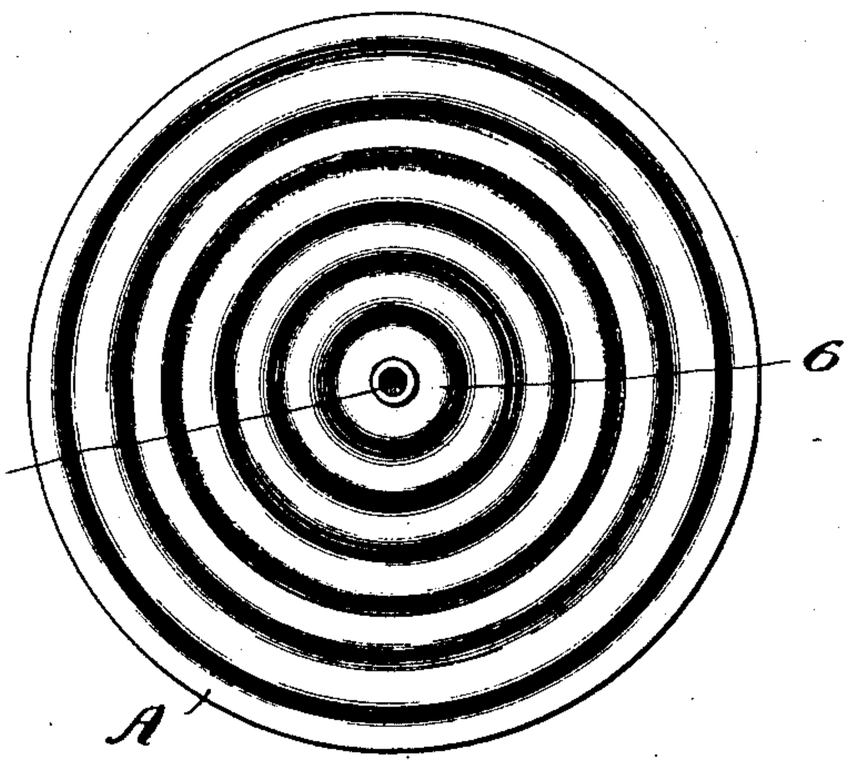


Fig. 2.

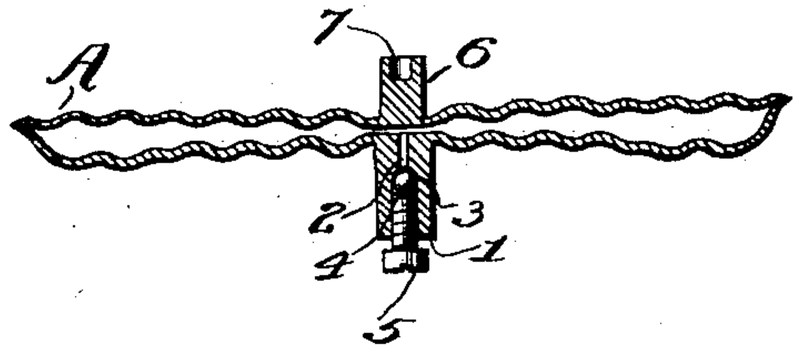
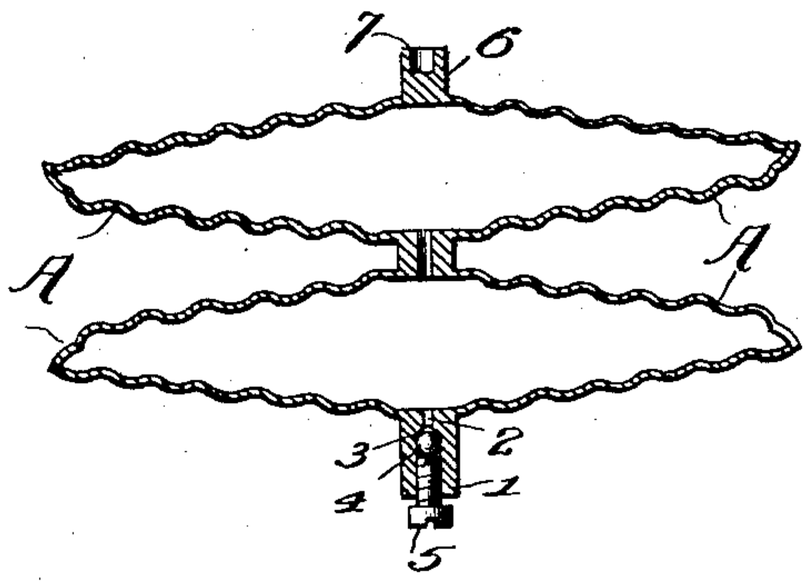


Fig. 3.



Witnesses
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No. 731,959. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

HENRY M. SHEER, OF QUINCY, ILLINOIS.

REGULATOR-DISK.

SPECIFICATION forming part of Letters Patent No. 731,959, dated June 23, 1903.

Application filed July 23, 1902. Serial No. 116,657. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. SHEER, a citizen of the United States, and a resident of Quincy, in the county of Adams and State of Illinois, have invented a new and useful Improvement in Regulator-Disks, of which the following is a specification.

My invention relates to regulator-disks, and has for its principal object the provision of an article of this nature which will be sensitive and respond to the minimum degrees of heat and cold and yet one which will suffer no injury when exposed to a considerable degree of either heat or cold. In attaining this object I preferably construct my device of spring-brass in a very substantial manner and corrugate the sides thereof deeply, which sides inclose a hollow interior chamber.

Another object is to provide my disk with a valve through which to introduce the expansive medium, as ether, into the interior chamber after the disk is completed without the necessity of any soldering after the disk has been filled, as has been customary heretofore.

A still further and equally important object is to provide a means by which the disks or wafers can be sealed at any desired temperature.

With the foregoing objects in view my invention consists of certain novel details of construction and combinations of parts, such as will be described more fully hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of my invention. Fig. 2 is an enlarged longitudinal section, and Fig. 3 is a vertical sectional view showing the manner of combining a plurality of disks.

A is the disk or wafer. This is preferably made of two pieces of spring-brass, deeply corrugated in concentric ridges. These plates are soldered or otherwise secured together in any approved manner at their outer edges to form an inclosed chamber, and in this chamber a suitable expansible liquid is contained. By reason of the deep corrugations and the utilization of spring-brass the tendency of the disks to buckle or operate by jerks resulting in a spasmodic action is averted. Another feature of importance to be noted is that the disk or wafer is so stamped and the sides thereof united in such a manner that one at least of the surfaces of the device is dished inwardly more or less, as shown in Fig. 2. The object of this construction is to obtain the benefit of the spring in the metal to cause it to act quickly and respond to the least contraction of the sensitive fluid inclosed and also when expanded, as illustrated in Fig. 3, to obtain the benefit of the space from the dished point to the plane of the edges of the disk or wafer and as much more as is required beyond this point when under extraordinary or excessive pressure, so that the disk may be exposed to very low or high degrees of temperature without danger or injury thereto. If the sides of the disk were so formed that they would naturally or normally be straight instead of dished, a vacuum would be required in the disk or else a heavy weight outside to bring the sides below the straight line, and a disk of this construction could not operate successfully or with accuracy except when sufficiently expanded to keep the sides bulged or convexed outward far beyond the straight line. From the foregoing it will be seen that the disk or wafer is normally contracted, as shown in Fig. 2, its liquid contents being reduced in volume, whereas when under abnormal conditions, as when heated, it expands, causing the disk or disks to increase in thickness. It is by taking advantage of this contraction and expansion of the disk or wafer that the device is utilized for its present purposes.

At the center of the disk or wafer is located my improved valve, through which the disk is filled with its expansive medium, instead of through a hole in the sheet metal, as heretofore, which hole requires subsequent soldering.

My improved valve consists of a nipple 1, which depends from the disk or wafer and is in communication with the hollow interior of the disk by means of a small bore or duct 2. The bore is preferably cylindrical and internally screw-threaded and is provided with a slight taper at the extreme inner end, as at 3. A ball-valve 4, of lead or other suitable compressible material—as, for instance, a shot—is fitted into the threaded bore of the nipple and to the tapering seat 3, and a screw 5 is adapted to be screwed into the threaded bore

and against the ball-valve to force the latter securely into place, thus making a perfect seal, which will not leak. The ball-valve can be removed when desired and the disk refilled, should it ever be necessary to do so, no soldering being required.

Projecting upwardly from the disk or wafer is a hub 6, in which a socket 7 is formed for the reception of one end of a rod.

A disk of this construction is extremely sensitive to varying temperatures and operates quickly and with precision, and, furthermore, it is capable of being easily filled and effectually sealed against leakage and without the exercise of more than ordinary skill. At the same time it admits of being charged with a medium at a predetermined temperature.

Another form of my device is illustrated in Fig. 3 of the drawings, in which is shown a plurality of disks secured axially together, the connection between them being hollow and integral with the adjacent sides of the disk to admit of free circulation of the confined medium from one disk to the other during the filling and operation of the disk.

It is evident that slight changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a temperature-regulator, a hollow disk, a nipple communicating with the hollow interior of the disk, a body of pliable material located in the nipple and means for expanding the pliable material to hermetically close the nipple and render the hollow interior of the disk air-tight.

2. In a temperature-regulator, a disk or wafer composed of spring-brass members secured together at their peripheral edges, and a valve comprising a nipple depending from one of the disk members, the nipple provided with a restricted bore communicating with the hollow interior of the disk or wafer, a portion of the bore provided with threads, an expansible valve adapted to be received in the bore and a screw adapted to be received in the threaded portion of the bore and contact with the valve to force it securely into its seat completely filling the bore of the nipple whereby to make a perfect seal and prevent leakage.

3. In a temperature-regulator, a disk or wafer composed of a pair of stamped members secured together at their peripheral edges, a nipple secured to one of the members, the nipple provided with a restricted bore communicating with the hollow interior of the disk or wafer, a seat formed in the inner end of the nipple, a valve of soft material received upon the seat, a portion of the bore being threaded and a screw received in the threaded portion of the bore and bearing against the valve to cause it to completely close the communication between the nipple and hollow interior of the disk or wafer and render the latter air-tight.

4. In a temperature-regulator, a disk or wafer provided with a hollow interior, a nipple secured to the disk or wafer and provided with a bore in communication with the hollow interior whereby the latter is filled, a seat formed in the inner end of the bore, an expansible valve adapted to be received in the seat, the nipple provided with an internally-threaded portion, a screw received therein and adapted to force and expand the valve firmly into its seat to render the disk air-tight and retain the material with which it is filled therein, and a hub located centrally of the disk or wafer and on the opposite side thereof from the nipple.

5. In a temperature-regulator, a disk or wafer inwardly dished at the center and provided with a hollow interior, a nipple secured to the disk or wafer and provided with a bore in communication with the hollow interior whereby the latter is filled, a seat formed in the inner end of the bore, an expansible valve adapted to be received in the seat, the nipple provided with an internally-threaded portion, a screw received therein and adapted to force the valve firmly into its seat to render the disk air-tight and retain the material with which it has been filled therein, and a hub located centrally of the disk or wafer and on the opposite side thereof from the nipple.

6. In a temperature-regulator, a plurality of disks or wafers secured together, the inner members comprising two plates inwardly dished at the center, the two plates connected to each other by means of hollow collars, integral with the plates the end members comprising single plates inwardly dished at their centers, the end plates or members secured to the combined members at their outer edges, the combined members likewise secured together at their outer edges, one end member provided with a nipple having an internally-threaded bore communicating with the hollow interior of the first disk, a seat formed in the bore of the nipple, a removable valve of soft material adapted to be received in the bore of the nipple, and a screw removably received in the bore and adapted to contact with the valve and force it tightly into its seat whereby the valve is expanded to prevent leakage.

7. In a temperature-regulator, a plurality of disks or wafers, each disk or wafer having a hollow interior adapted to receive and contain an expansive medium, integral hollow necks connecting the disks or wafers in series, the outermost disk provided with an expansible valve by means of which the expansive medium is introduced into the series of disks and means for removably retaining the valve in closed position.

8. In a temperature-regulator, a plurality of hollow disks or wafers, hollow connections between each two adjacent disks or wafers, the outermost disk or wafer provided with a

hollow internally-threaded nipple, a tapering seat formed in the bore of the nipple, a removable valve of pliable material received on the seat and a screw received in the threaded portion of the nipple and bearing continuously against the valve to spread the latter and form a seal for the valve.

9. In a temperature-regulator, the combination with a hollow disk or wafer adapted to contain an expansive medium, of a nipple secured thereto, the nipple provided with a bore communicating with the hollow interior of the disk or wafer, a seat formed in the bore, an expansible valve adapted to rest upon the seat after the expansive medium has been received in the disk or wafer and means received in the nipple and engaging the valve to expand the latter in its seat to prevent the egress of the expansive medium in the disk or wafer.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

HENRY M. SHEER.

Witnesses:
M. S. ORR,
J. M. RUDY.