(No Model.)

H. RAUSER, C. WIEBER & A. SOKOLOFF.

PRESSURE GAGE.

No. 507,387. Patented Oct. 24, 1893.

Fig. 2

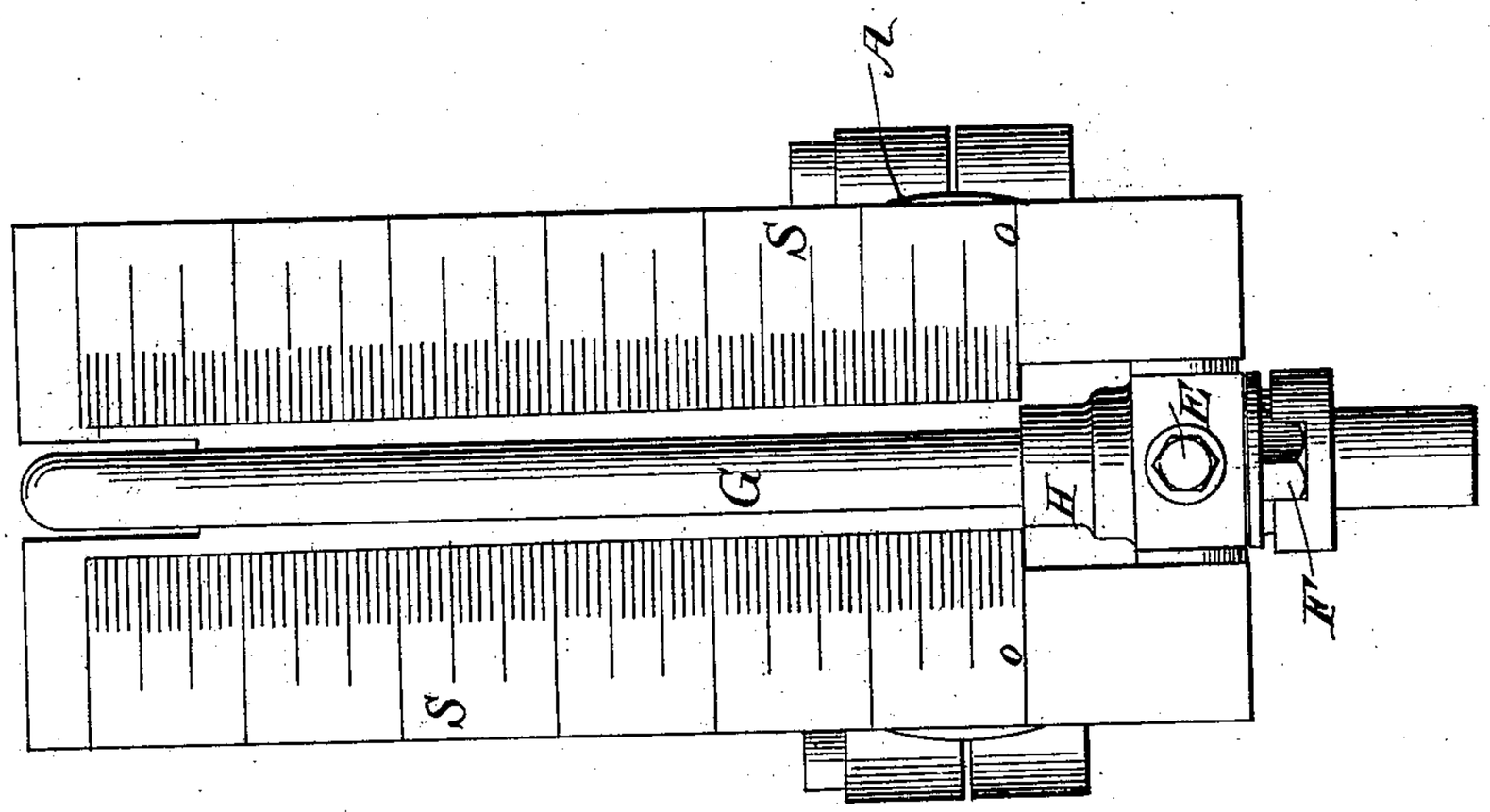
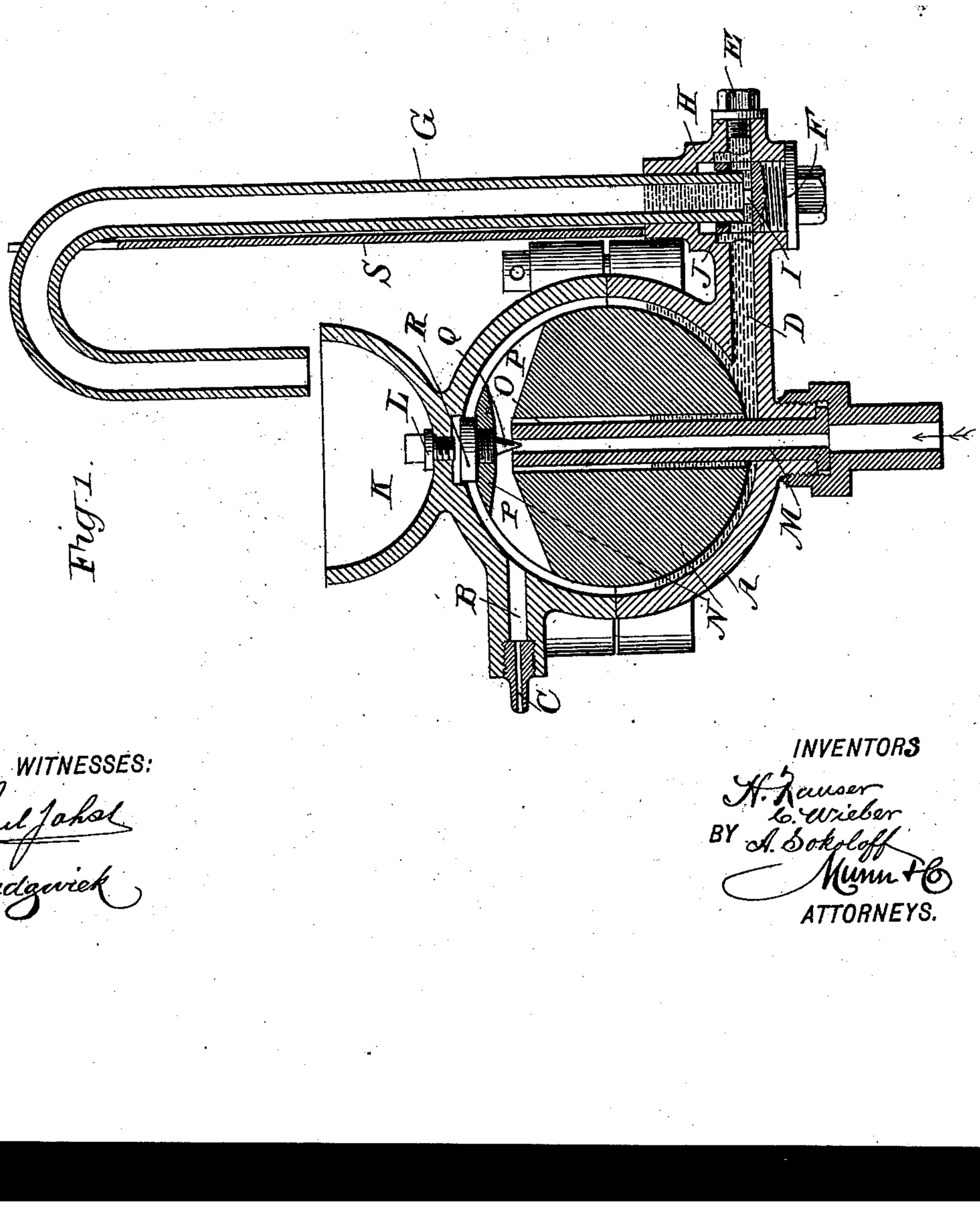


Fig. 1.



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HENRY RAUSER, CHARLES WIEBER, AND ALEXIS SOKOLOFF, OF MOSCOW, RUSSIA.

PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 507,387, dated October 24, 1893.

Application filed June 3, 1893. Serial No. 476,492. (No model.)

To all whom it may concern:

Be it known that we, HENRY RAUSER, CHARLES WIEBER, and ALEXIS SOKOLOFF, all subjects of the Emperor of Russia, and residents of Moscow, in the Empire of Russia, have invented a new and Improved Pressure-Gage, of which the following is a full, clear, and exact description.

The object of the invention is to provide a steam pressure gage the parts of which will be subjected to a slight pressure, and which will be very reliable and sensitive in its operation.

To this end the invention essentially consists of two communicating tubes which are both open at their upper ends, and partially filled with a suitable liquid, and a float-controlled valve of a peculiar construction which is adapted to regulate the admission of steam to one of the communicating tubes, whereby a pressure is exerted at intervals upon the surface of the liquid, and the latter is caused to rise in the other communicating tube to indicate the pressure of steam or other medium on an appropriate graduated scale.

The invention will be fully disclosed hereinafter, and the features of novelty pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a central sectional elevation of our improved pressure gage; and Fig. 2 is a side elevation of the same.

The pressure gage consists primarily of a spherical casing A made in two halves so as to be readily taken to pieces. In its upper part the casing is provided with a channel B into the outer orifice of which is screwed a nozzle C the bore of which is of less diameter than the channel B. In the lower part of the casing there is provided a channel D which is essentially level with the bottom of the spherical cavity of the casing. The outer orifice of channel D is normally closed by means of a screw-plug E. Another screw-plug F, closes a vertical opening extending at right angles to channel D.

G is an essentially vertical tube preferably made of glass or of other transparent material, and is passed through an opening in the extension H of the casing A. The lower end of tube G reaches into the plug F and rests on a rib I provided in the same. A packing ring or washer J is employed to tighten the joint between the tube G and plug F. The upper end of tube G is preferably bent downward over a cup K formed at the top of casing A.

L is a screw-plug adapted to close an opening located at the highest point of casing A.

M is a tube centrally inserted into casing A from below, and extending into the upper part of the same. Within the spherical chamber of the casing there is a ball float N the specific gravity of which is less than that of the liquid with which the lower part of the casing and of tube G are to be filled. The float N is provided with a vertical central bore O adapted to receive the tube M, and with transverse openings P. At the top of the float an adjustable conical valve Q is screwed in, said valve being adapted to have its seat in the upper end of tube M. The collar R of the valve is preferably guided in a cylindrical recess of the casing A, as shown.

S is a scale graduated to indicate the pressures corresponding to different levels of the liquid in tube G.

The operation of the device is as follows: Screw-plug L is removed to fill the spherical cavity of the casing A and tube G with mercury or any other approved liquid, up to the zero mark of the scale S. The float N is so constructed as to slightly lift the valve Q off the upper end of tube M when the liquid is level with the zero mark, as shown. Tube M is connected with the boiler. It will be understood that when the parts are in their initial position, steam may pass up through tube M, the openings P to the spherical chamber of casing A and into the bore O, and to the surface of the liquid contained in the spherical chamber and said bore. As the steam cannot escape through the contracted nozzle C as fast as it enters casing A, a certain pressure will be exerted upon the surface of the mercury in the casing, which will cause the said mercury to rise in tube G and to fall

in the casing A. The pressure in the casing will however be slight in comparison with the boiler pressure, since the small quantity of steam which issues from tube M past the valve Q instantly expands within the casing, whereby the steam pressure is considerably reduced. As the level of the mercury falls in the casing A, the float N also sinks and brings the conical valve Q on to its seat to close the upper end of tube M and thus to cut off the admission of steam. It will be obvious that a part of the weight of float N will keep valve Q pressed on its seat when the mercury recedes from casing A. When the steam that has remained in the casing condenses, or when the boiler pressure increases so as to be capable of lifting the valve Q off its seat, the spherical cavity of the casing A will again be in communication with the steam tube M. It will be understood that the condensation of steam in casing A will allow the mercury to gradually flow back into the same till the valve Q can be lifted by the boiler pressure. This operation will be repeated periodically and automatically.

It will be obvious that a definite level of the mercury in tube G will correspond to the amount of boiler pressure. The scale S can therefore be graduated to exactly indicate such boiler pressure.

The main advantage of the invention is that the parts of the pressure gage are subjected to a very slight pressure, and in consequence thereof a comparatively short tube G will be sufficient to hold the indicating column of liquid when the same rises to the level corresponding to the highest boiler pressure. When the upper end of tube G is bent down over cup K, as shown in Fig. 1, any liquid that may rise to the bend will be collected in the said cup, whence it can be returned into the casing A by removing the screw-plug L.

It will be obvious that while the drawings represent a pressure gage which embodies the above described improvements in a very practical form, yet many details may be altered without departing from the nature of the invention. We do not, therefore, confine ourselves to the spherical shape of the casing A and float N, as the shape of these parts is immaterial so long as the float is capable of rising and falling in the casing. The channel B may be dispensed with, if desired, and the nozzle C put in the place of the screw-plug L. The valve Q instead of being conical, may be cylindrical or of any other suitable shape, though it is believed that a conical valve will insure the most sensitive operation. The apparatus may also be employed for measuring the pressure of vapors.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a pressure gage, the combination, with a casing having a nozzle or outlet leading therefrom, and a tube communicating with the said casing at one end, said casing and tube being adapted to be partly filled with a suitable liquid, of a float held in the casing, a tube leading into the said casing from the outside thereof, and a valve secured to the float and adapted to temporarily close the inner end of said tube to cut off the admission of the medium entering the tube under pressure, substantially as described.

2. In a pressure gage, the combination, with a casing having a nozzle or outlet leading from the upper part thereof to the surrounding air, and an upright tube communicating at one end with the lower part of the said casing and at the other end with the surrounding air, said casing and tube being adapted to be partly filled with a suitable liquid, of a vertical steam tube leading into the said casing from the outside thereof, a float held in the casing and having a guided movement along the said steam tube, and provided with openings through which the steam tube may communicate with the inside of the casing, and an adjustable valve secured to the upper part of the float and adapted to temporarily close the upper end of said steam tube to cut off the admission of steam, substantially as described.

3. In a pressure gage, the combination, with a casing having a spherical chamber and a contracted nozzle or outlet leading from the upper part thereof to the surrounding air, said casing having a cup formed at its top, an upright tube communicating at one end with the lower part of the said casing and having its other end open and located above the cup at the top of the casing, said casing and tube being adapted to be partly filled with a suitable liquid, and a graduated scale arranged parallel with the said tube, of a central vertical steam tube leading into the said casing from below, a spherical float held in the casing and having a guided movement along the said steam tube, and provided with openings through which the steam tube may communicate with the chamber within the casing, and an adjustable valve secured to the upper part of the float and adapted to temporarily close the upper end of said steam tube to cut off the admission of steam, substantially as described.

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