

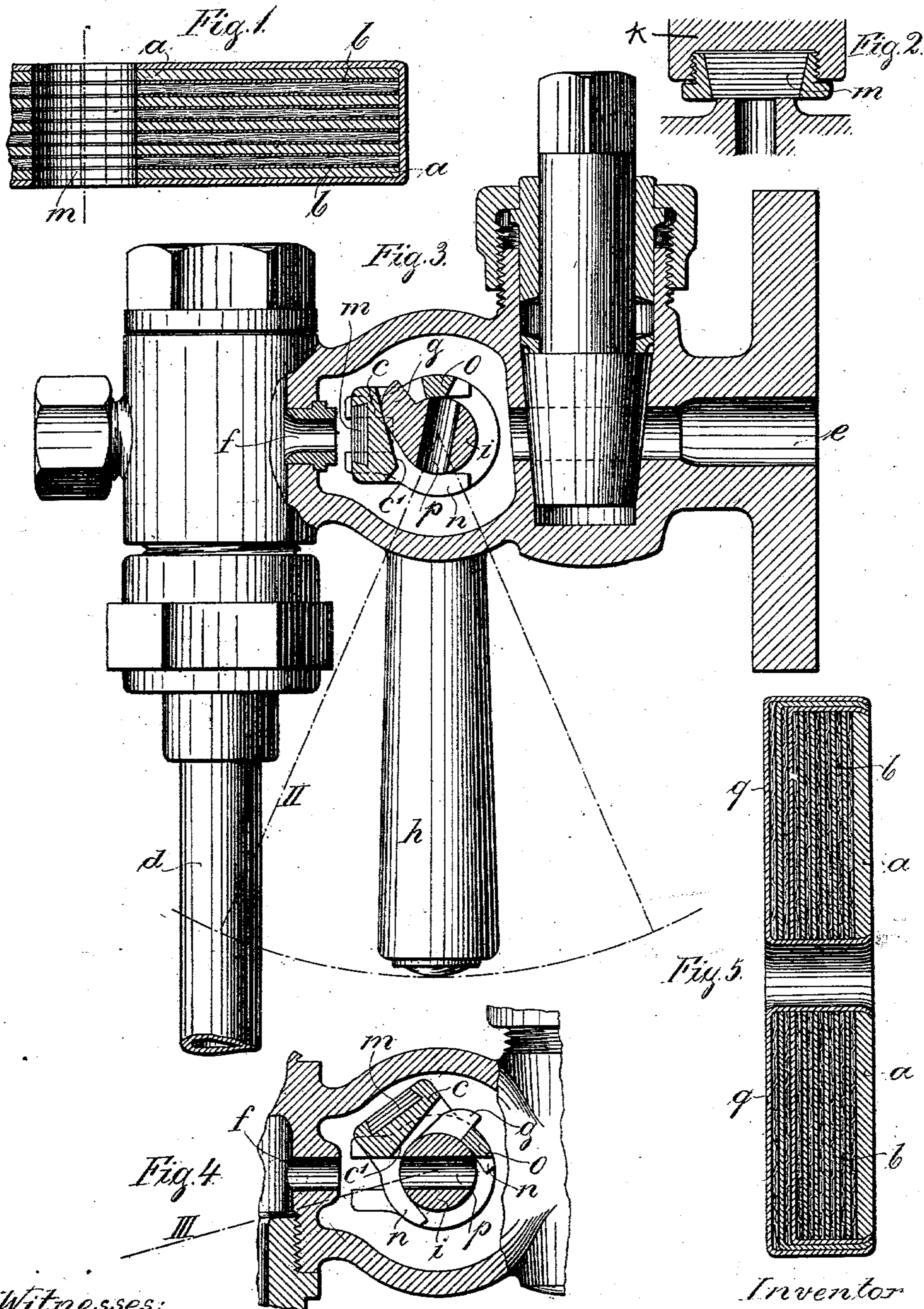
No. 745,501.

PATENTED DEC. 1, 1903.

W. KUHLMANN.  
VALVE.

APPLICATION FILED JAN. 14, 1902.

NO MODEL.



Witnesses:

*Carl Rupp*  
*Emil Hays*

Inventor  
Wilhelm Kuhlmann  
by *Kotter & J. J. J.*  
Attorney.

# UNITED STATES PATENT OFFICE.

WILHELM KUHLMANN, OF OFFENBACH-ON-THE-MAIN, GERMANY.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 745,501, dated December 1, 1903.

Application filed January 14, 1902. Serial No. 89,838. (No model.)

*To all whom it may concern:*

Be it known that I, WILHELM KUHLMANN, a subject of the Grand Duke of Hesse-Darmstadt, and a resident of Offenbach-on-the-Main, in the Grand Duchy of Hesse-Darmstadt, German Empire, have invented certain new and useful Improvements in Valves, of which the following is an exact specification.

My invention relates to improvements in valves, and has especially for its purpose to provide a valve for high steam-pressure, and especially overheated steam, in which valve a good tightening is insured.

In order to make my invention more clear, I refer to the accompanying drawings, in which—

Figure 1 shows the construction of the tightening-plate partly in view and partly in section. Fig. 2 shows the tightening parts of the valve. Fig. 3 shows the invention applied to a water-gage valve. Fig. 4 shows the main parts of the construction shown in Fig. 4 in another position. Fig. 5 is a section of another modification of the tightening-plate.

Hitherto it has been very difficult to attain a good tightening in valves or other steam-engine and boiler fittings, especially in case of high steam temperatures and high steam-pressure, in which case the tightening-surfaces of the valves or fittings are always easily destroyed. The Jenkins material which has been used for tightening purposes can no more advantageously be used in case the pressure is higher than six atmospheres. Metal tightenings have the disadvantage that on account of the small surfaces ground one upon the other they are very sensible against dirt, wear, or damaging and get very easily untight. Furthermore, in the latter class of tightenings always a high pressure is necessary for sufficiently closing the valves or tightening the fittings. The same disadvantages occur in tightenings manufactured of nickel or copper rings, as also in this construction there is no elasticity between the valve-seat and the valve-cone, so that these two parts can adjust one to the other. These disadvantages are done away with by the object of my present invention, in which a large flat tightening-surface is provided which tightens even when pressed upon the

seat with very low pressure and which is nearly insensible against dirt or wear, at the same time allowing the use of high temperatures and high pressures.

The valve-cone *k*, Fig. 2, of any kind of a valve is constructed so as to overlap the valve-seat. To the lower side of this valve-cone an exchangeable disk *m* is fixed, the construction of which may be seen from Fig. 1. This disk or plate *m* consists of a plurality of thin metal-sheet plates *a*, (about one-tenth of a millimeter thick and advantageously manufactured of copper or nickel,) between which plates very thin plates *b*, manufactured of asbestos, are situated. Between the disks *a* and *b* a suitable material may be situated for sticking the plates together—as, for instance, red lead, graphite, or the like. The plate *m* so manufactured is exposed to a high hydraulic pressure of about a thousand atmospheres, so as to obtain a solid material, which is brought into the desired form and provided with a casing *q* in order to keep the edges of the plates together. This casing may be manufactured mechanically or galvanoplastically and serves only for preventing the tearing of the disk or plate on its outer edge. The tightening-plate so obtained is very advantageously used in all kinds of valves on account of the thin layers of metal and asbestos insuring a sufficient elasticity, and, furthermore, a tearing of the single parts and a destroying of the same, which easily occurred in all metallic tightenings hitherto used, is perfectly impossible. The thin sheet-metal plates protect the asbestos plates situated between the same and sticking to the same partly on account of the sticking material, partly on account of the adhesion, while on the other hand the asbestos plates give the necessary elasticity to the metal plates. The principal thing consists in the metal and asbestos plates being very thin and being protected against the tearing on their outer edges by a casing.

Fig. 3 shows the invention applied to the valve or water-gage. *c* is the closing-body, provided with the plate *m*, described above, which body *c* is pressed against the valve-seat *f*, situated in the passage *e*, leading to the boiler. The body *c* can be pressed toward the seat *f* either by hand or automatic-

ally in case the water-gage glass *d* bursts. The part *c* is guided by means of a fork *m*, fixed to the same, the legs of which fork are situated on both sides of an axle *i*, provided with a nose *g*. The nose *g* slides along the face *c'* in case the axle *i* is turned, hereby moving the tightening-plate *m* toward the valve-seat *f*. The turning of the axle *i* is effected by means of the handle *h*. In the position of the handle shown in Fig. 3, which position is the normal position, the water-gage glass *d* communicates with the boiler. In case the handle *h* is turned, the tightening-plate *m* is pressed against the valve-seat *f*, and the communication of the water-gage glass *g* with the boiler is interrupted. The same will be the case if the water-gage glass bursts, in which case the part *c* will be pressed forward by the steam entering through the passage *e*, hereby pressing the plate *m* upon the valve-seat *f* and closing the same. In order to open the valve, the handle is brought to the position II. In bringing the handle *h* in this position the nose *g* of the axle *i* pushes against a nose *o*, fixed to one leg of the fork *m*, hereby shifting the part *c* back and opening the valve-seat *f*. In order to be able to easily clean the arrangement, the handle *h* is brought into the position III, Fig. 4, in which position the part *c* is turned so far that the

bore *p* of the axle *i* forms a prolongation of the valve-seat *f*, so that the valve-seat *f* and the passage *e* can be easily cleaned by pushing a bar or the like through the same.

In Fig. 5 of the accompanying drawings a modification of the plate *m* is shown. In this modification a few metal plates *a* are bowed up on the outside, so as to run parallel to the walls of the casing surrounding the plates. This has the advantage that in case the casing is torn the whole plate is still kept together by the bowed-up part of the following metal plate *a*.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

A flat tightening-plate for valves, consisting of thin metal plates and thin asbestos plates alternately arranged one above the other and pressed together so as to form a solid plate, and a casing closely surrounding said plate, substantially as described and for the purpose set forth.

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

WILHELM KUHLMANN.

Witnesses:

HERMAN GÖRLICH,  
JOHANN FALKENSTEIN.