No. 661,200. Patented Nov. 6, 1900.

J. WEHINGER.

SLIDE COCK FOR MIXING WATER AND STEAM.

(Application filed Nov. 21, 1899.)

(No Model.) 2 Sheets—Sheet 1.

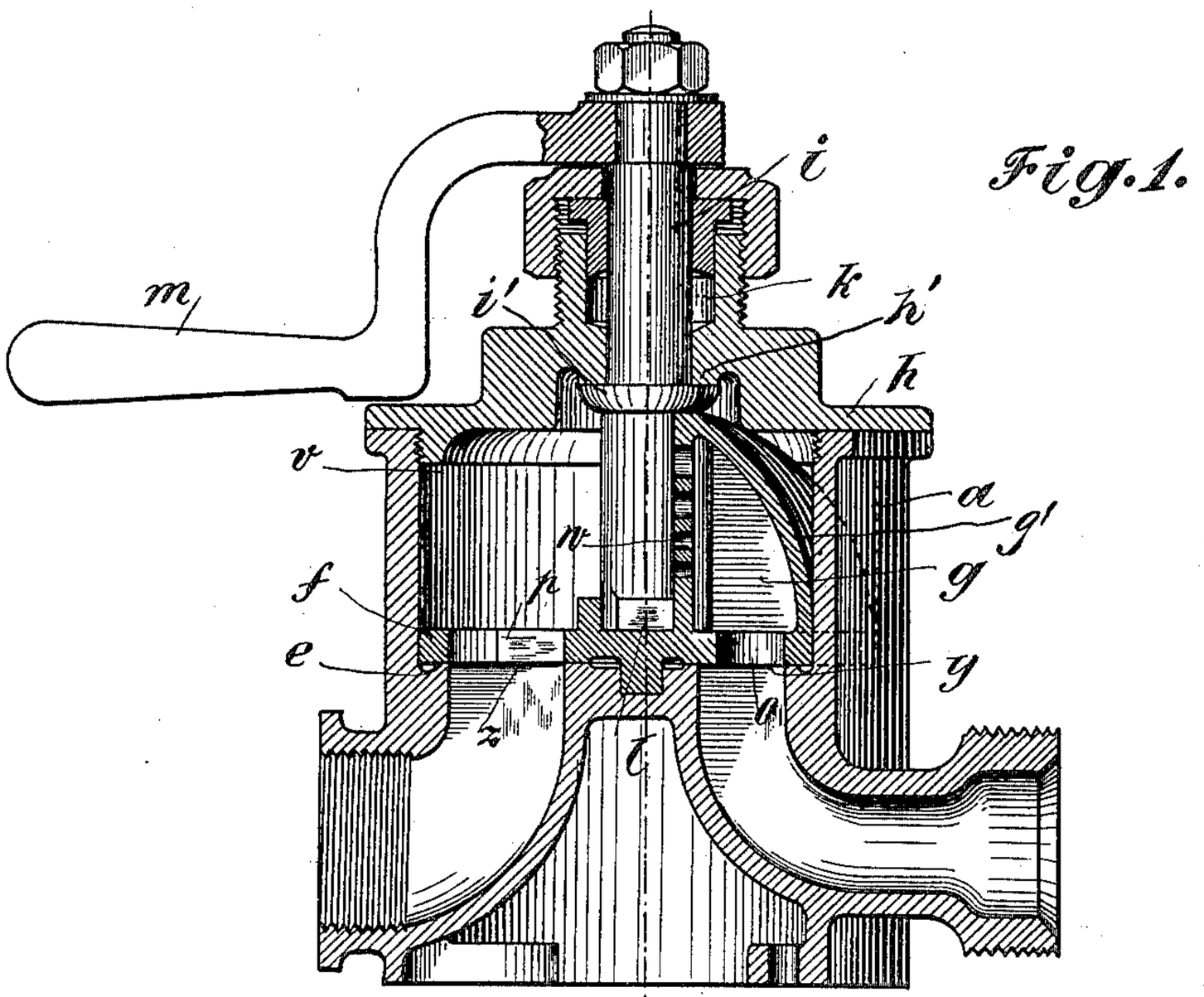

Fig. 1.

Fig. 2.

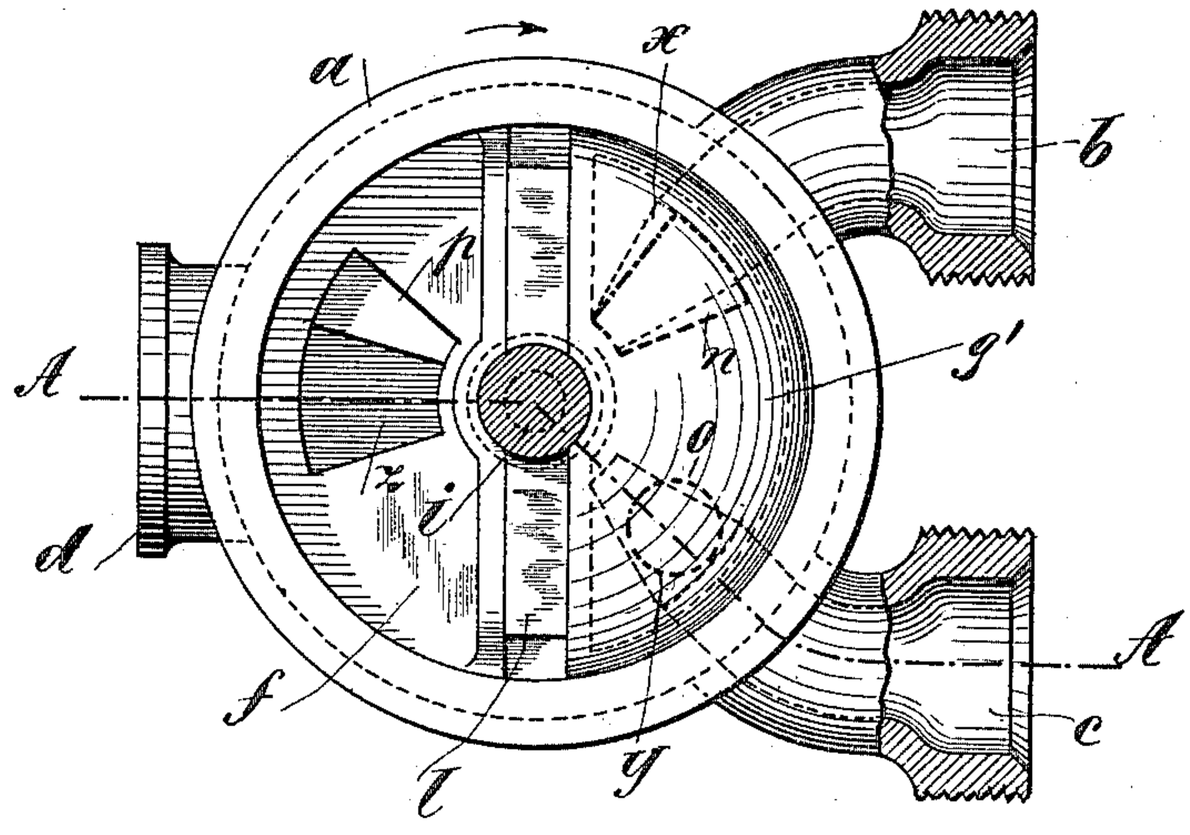

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Fig. 3.

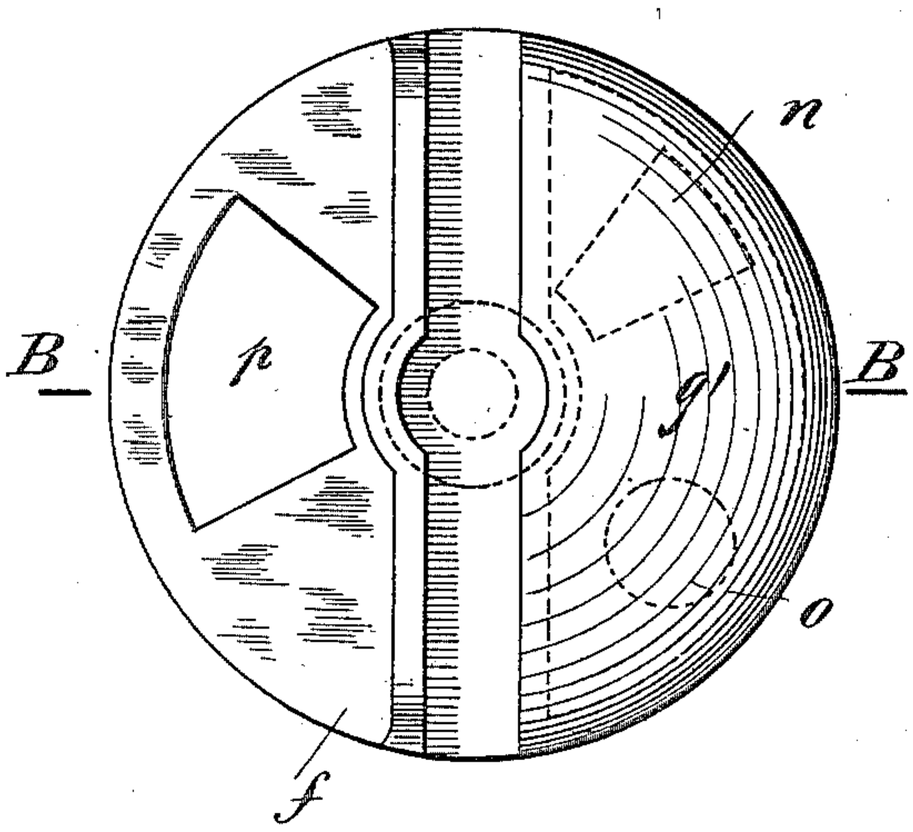


Fig. 4.

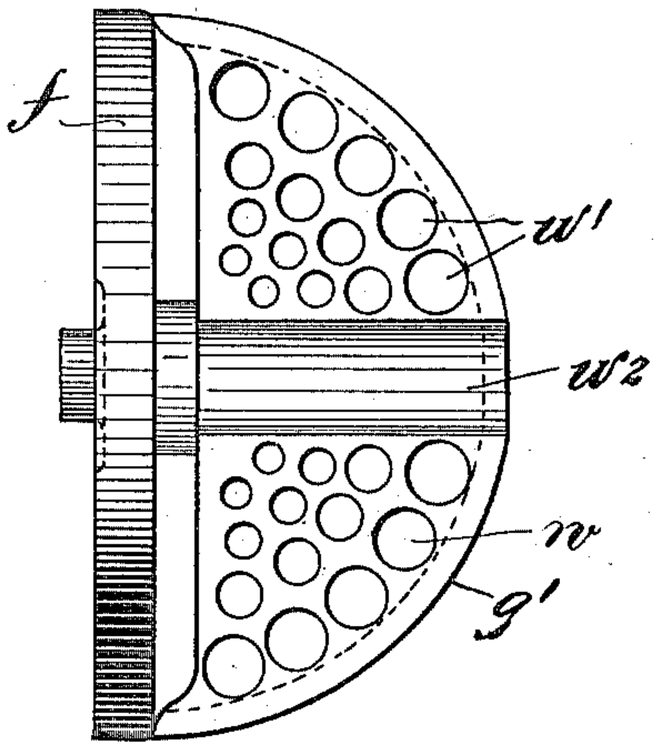
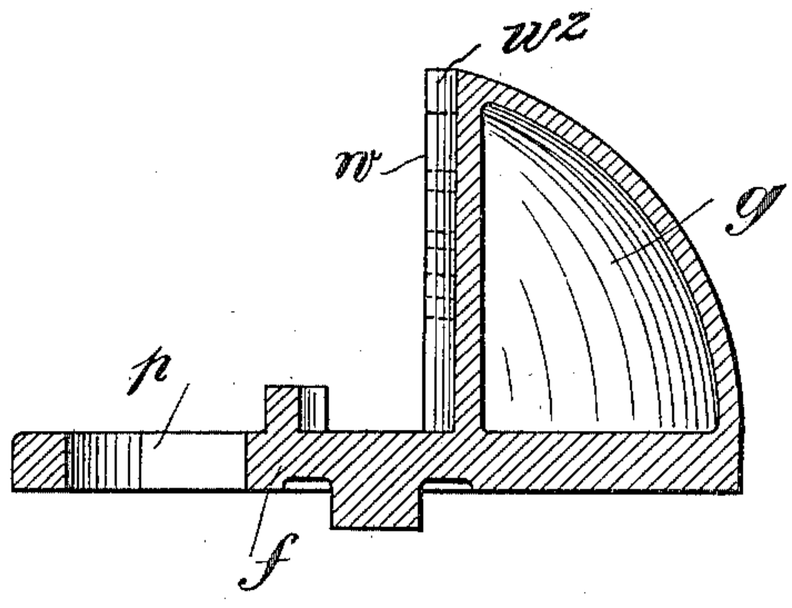


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SLIDE-COCK FOR MIXING WATER AND STEAM.

SPECIFICATION forming part of Letters Patent No. 661,200, dated November 6, 1900.

Application filed November 21, 1899. Serial No. 737,773. (No model.)

To all whom it may concern:

Be it known that I, JOHANN WEHINGER, a subject of the Emperor of Austria-Hungary, residing at Zurich, Switzerland, have invented new and useful Improvements in Slide-Cocks for Mixing Water and Steam, (for which I have filed patents in Switzerland on the 3d of May, 1899, application No. 20,589, and in Germany on the 18th of August, 1899, application No. W. 15,440,) of which the following is a specification.

My invention has relation to compound cocks—that is to say, to that type of cocks whereby different fluids can be drawn from sources of supply and discharged through a common outlet.

The essential object of my invention lies in the provision of means whereby different fluids may not only be admitted to and discharged from the cock, but whereby such fluids are mixed before being discharged, and whereby the relative proportions of fluids to be mixed can be regulated or varied.

That my invention may be fully understood I will describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view taken on line A A of Fig. 2 of a compound cock embodying my invention. Fig. 2 is a sectional top plan view of said cock, the cover or cap being removed. Fig. 3 is a top plan view, Fig. 4 an elevation, and Fig. 5 a section taken on lines B B of Fig. 3, of the controlling-valve of said cock.

From the following description it will be apparent that different fluids may be separately admitted and discharged, or different fluids may be admitted to, mixed in, and discharged from my improved compound or mixing cock, and as an illustration of this I will describe its construction and operation in relation to the combining of a heating agent, as steam or hot water, with cold water.

Referring to Figs. 1 and 2, *a* indicates the casing of cylindrical form internally and open at top, the bottom *e* serving as a seat for a revoluble discoidal controlling-valve *f*. In the said bottom of the casing *a* are formed three sector-shaped ports *x*, *y*, and *z*, leading to fluid passages and branches *b*, *c*, and *d*, respectively. The branch *b* is the cold-water-supply branch, the branch *c* the hot-water or steam supply branch, and the branch *d* the discharge branch. The ports *x* and *y* are located on one side, and the port *z* is located on the opposite side of a diametral line of the bottom of the casing.

The controlling-valve *f* is, as above referred to, a discoidal valve, seated, as stated, on the bottom *e* of the casing and is stepped to revolve in a suitable axial step-bearing formed in said bottom. In its upper face the valve *f* is provided with a diametral groove or seat for radial arms *l* on the valve-stem *i*, which is provided with a collar or circular flange *i'*, Fig. 1, upon which bears an annular projection *h'* on the under side of the cap or cover *h* for casing *a*, which cap may be secured to said casing in any desired manner, so as to cause the projection *h'* to bear on flange *i'* of valve-stem *i*, hold its arms *l* in their seat, and prevent the valve *f* from rising under the pressure of the inflowing fluids. In Fig. 1 I have shown the casing as threaded internally and the cap *h* as provided with a correspondingly-threaded annular flange for securing the cap *h* to said casing, said cap being provided with a suitable stuffing-box *k*, through which the valve-stem *i* extends, and said valve-stem carries at its outer end a suitable handle *m* for obvious purposes.

The valve *f* has three ports *n*, *o*, and *p*, corresponding to the ports *x*, *y*, and *z*, respectively. The ports *n p* are sector-shaped, while the port *o* is preferably circular. The cross-sectional area of ports *n* and *o* is equal to the like area of the admission or supply ports *x y*, respectively, while the cross-sectional area of port *p* is considerably greater than the like area of discharge-port *z*. The distance between the valve-ports *n* and *o* is somewhat less than the distance between the supply-ports *x y* controlled thereby, as by this means I am enabled to vary the proportion of cold water admitted to the casing relatively to the proportion of hot water or steam, and vice versa, and to admit either fluid separately or collectively.

In order that the two fluids may be intimately mixed before being discharged, I divide the casing *a* above the valve *f* into two chambers *g* and *v* by means of a perforated partition *w*, the former chamber *g* above ports

x y being the mixing-chamber and the chamber v above port z the discharge-chamber. This partition may be secured in position in any desired manner. In practice and with a view to more intimately mixing the fluids I form the mixing-chamber with its perforated partition integral with the controlling-valve f, approximately one-half of which is dome-shaped above the valve-ports n and o, the vertical wall of the chamber so formed being provided with numerous perforations or ports w', the cross-sectional area of which is gradually reduced, the upper or outer semicircular row of ports being of greatest cross-sectional area. The partition-wall w has a central vertical recess w^2, fitting the valve-stem i, while the upper edge of the half-dome g' fits under the collar i' on valve-stem i.

By the described construction of valve and mixing-chamber important advantages are secured. In the first place, it would be somewhat difficult to divide the casing above the valve into two chambers by means of a perforated stationary partition and avoid the passage of the fluids between the said partition, the valve, and its stem. This of course is absolutely avoided by forming the mixing-chamber g integral with the valve f, thus compelling the fluids to flow through the ports w' in the wall of chamber g. On the other hand, when so constructed the mixing-chamber partakes of the movements of the valve, and as the outer wall of said chamber converges to, or approximately to, the axis of the casing the inflowing fluids are directed both upwardly and inwardly, whereby a more intimate admixture of said fluids is effected, and this is materially enhanced by increasing the cross-sectional area of the ports w' in the vertical wall w of chamber g in a radial direction. In one cut-off position the valve-port o is between the supply-ports x and y, while the valve outlet-port p does not quite clear the casing discharge-port z, leaving, however, but a slit, and this is immaterial, since both inlet-ports x and y are cut off. In turning on the supply of fluids from this position of cut-off the handle m is turned in the direction of arrow, Fig. 2, or from left to right. If the valve f is turned to a certain extent in the direction referred to, the valve-port n will partly uncover the cold-water-supply port x, while the hot-water or steam supply port y will remain closed, because the distance between valve-ports n and o is less than the distance between the supply-ports x y, so that cold water only will flow into chamber g, thence to chamber v, and out through ports p z, the latter port remaining always more or less uncovered, as above stated. By continuing the rotation of the valve f its port o will be gradually brought into register with the hot-water or steam supply port y, thus admitting cold and hot water or steam to the mixing-chamber g, while the proportion of the two fluids admitted is gradually increased. When the valve-port n is in full register with the cold-water-admission port x, the valve-port o will only be partly in register with the hot-water or steam port y, so that the volume of cold water flowing into chamber g is at all times greater than the volume of hot water when the valve is turned from the described cut-off position. The reverse may, however, take place by turning the valve in a direction opposite to that of the arrow, Fig. 2, from a cut-off position, in which the valve-port n will be between supply-ports x y instead of the valve-port o, as above set forth. In this case hot water or steam alone will first be admitted to chamber g until valve-port n comes into register with cold-water-supply port x, the volume of both fluids admitted gradually increasing until port o registers fully with hot-water port y, while port n will be partly in register with cold-water port x, the volume of hot fluid admitted preponderating at all times, as will be readily understood.

The construction of mixing-cock, as described, involves further advantages, in that the supply and discharge pipes can be located very close to one another, the whole device being very compact, and in that by the simple removal of the cap or cover h access is had to the valve f, which can also be readily removed.

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

1. The combination with a compound cock provided with intercommunicating mixing and discharge chambers, with a plurality of supply-passages opening into said mixing-chamber and with a discharge-passage opening into said discharge-chamber; of means for establishing communication between the mixing-chamber and either one or all of the supply-passages, for the purpose set forth.

2. The combination with the casing of a compound cock, a perforated partition dividing said casing into mixing and discharge chambers, supply-passages opening into said mixing-chamber and a discharge-passage opening into the discharge-chamber; of means for placing said supply-passages separately or collectively into communication with the aforesaid mixing-chamber, for the purposes set forth.

3. The combination with the casing of a compound cock, a partition dividing said casing into mixing and discharge chambers, said partition provided with rows of ports of increasing cross-sectional area, supply-passages opening into said mixing-chamber and a discharge-passage opening into said discharge-chamber; of means for placing said supply-passages separately or collectively into communication with the mixing-chamber, for the purpose set forth.

4. The combination with the casing of a compound cock provided with a plurality of supply-passages, and a discharge-passage; of a mixing-chamber in communication with said casing and a valve constructed and op-

erating to establish communication between the casing and discharge-passage and between the mixing-chamber and either one or all the supply-passages, said mixing-chamber moving with said valve, for the purposes set forth.

5. The combination with the casing of a compound cock provided with a plurality of supply-ports and a discharge-port in its bottom; of a revoluble discoidal valve seated on said bottom and provided with corresponding inlet and outlet ports and with a chamber encompassing its inlet-ports, said chamber in communication with said casing, for the purpose set forth.

6. The combination with the casing of a compound cock provided in its bottom with a plurality of supply-ports and with a discharge-port; of a revoluble discoidal valve seated on said bottom and provided with corresponding inlet and outlet ports, the distance between said inlet-ports being less than the distance between the corresponding supply-ports, for the purpose set forth.

7. The combination with the casing of a compound cock provided in its bottom with a plurality of supply-ports and with a discharge-port; of a revoluble discoidal valve seated on said bottom and provided with corresponding inlet and outlet ports, the distance between said inlet-ports being less than that between the corresponding supply-ports, the cross-sectional area of said inlet-ports being equal to the like area of said supply-ports, and the cross-sectional area of the valve outlet-port being greater than the like area of the casing discharge-port, for the purposes set forth.

8. The combination with the casing of a compound cock provided in its bottom with supply-ports x y and with a discharge-port z; of the revoluble valve f seated on said bottom and provided with ports n, o and p and with the dome-shaped chamber g having vertical perforated wall w, substantially as and for the purposes set forth.

9. The combination with the casing a provided in its bottom with ports x, y and z, the revoluble discoidal valve f seated on said bottom and provided with inlet-ports n, o, and an outlet-port p with a diametral seat groove or recess in its upper face, and with a journal on its under side stepped in a bearing in the bottom of said casing; of the valve-spindle i having radial arms l fitting into the aforesaid dimetral seat or groove, and a collar i', and the cap h for the casing having a circular projection h' bearing on the aforesaid collar i', substantially as and for the purposes set forth.

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

JOHANN WEHINGER.

Witnesses:

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E. BLUM.