

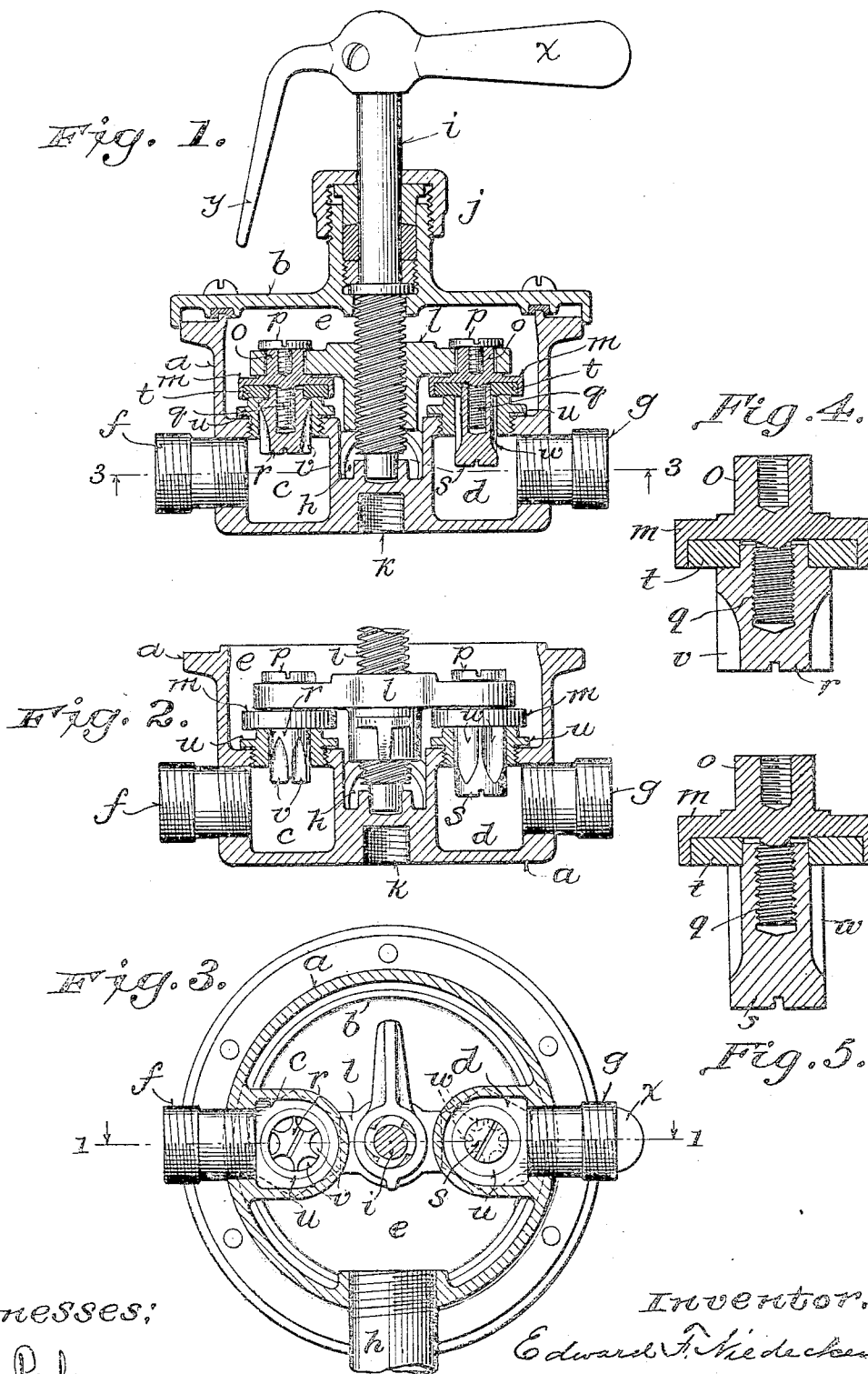
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MIXING VALVE.

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1,054,023.

Patented Feb. 25, 1913.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD F. NIEDECKEN, OF MILWAUKEE, WISCONSIN.

MIXING-VALVE.

1,054,023.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed September 16, 1911. Serial No. 649,751.

To all whom it may concern:

Be it known that I, EDWARD F. NIEDECKEN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Mixing-Valves, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates to improvements in mixing valves of the kind shown and described in United States Letters Patent No. 1,001,431 issued to me August 22, 1911.

The main object of the improvements constituting the present invention is to make the device readily adaptable to varying conditions of pressure and temperature to which the fluids controlled by the valve are subjected.

It consists in the construction, arrangement and combinations of parts as hereinafter particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is an axial section on the line 1-1, Fig. 3, of a mixing valve embodying the invention; Fig. 2 is a similar section of a portion of the valve case and an elevation of the internal mechanism of the valve, showing valve seats and graduating plugs of different sizes substituted for those shown in Fig. 1; Fig. 3 is a section of the valve in a plane indicated by the line 3-3, Fig. 1, perpendicular to the operating stem; Fig. 4 is an enlarged sectional view of the hot water valve disk and graduating plug; and Fig. 5 is a like view of the cold water valve disk and graduating plug.

The valve case *a* which is preferably of cylindrical shape, is open at one end and provided with a removable cover *b*. It is formed on opposite sides of the center with inlet chambers *c* and *d* and with a mixing and outlet chamber *e* which communicates with each of the chambers *c* and *d* through an opening in the intermediate wall or par-

tion in a plane perpendicular to the valve operating stem.

As the valve is designed primarily for regulating and controlling the mixture and delivery of cold and hot water for baths and the like, its construction and operation will be described for this purpose, although it may be used for other purposes, where the mixture of other fluids in varying proportions is desired.

The chamber *c*, which as the parts of the valve are assembled according to the drawing in the present case is the inlet chamber for hot water, has a supply connection *f*, and the chamber *d* has a cold water supply connection *g*. The intermediate mixing and outlet chamber *e* has a delivery or discharge connection *h*. An operating stem *i* passing through a stuffing box *j* on the cover *b* and having a central bearing *k* at its inner end in the back of the case between the chambers *c* and *d*, is threaded within the case to engage with a movable valve operating yoke *l*. Valve disks *m* are formed or provided on one side with stems *o* which are loosely fitted and removably secured by screws *p* in openings in the yoke *l* equidistant from the stem *i* and in alinement with the openings between the chambers *c* and *d* and the chamber *e*. On their opposite sides the disks *m* are formed or provided with stems *q*, on which are removably threaded graduating plugs *r* and *s*. Between the disks *m* and the plugs *r* and *s* renewable packing rings or gaskets *t* are clamped, the disks being preferably recessed to receive the rings or gaskets which are fitted into them, as shown in Fig. 1.

Interchangeable valve seats *u* having ports of different areas or sizes according to the varying conditions of temperature and pressure under which the valve is to be used, are threaded or otherwise removably fitted in the openings between the chambers *c* and *d* and the chamber *e*. These seats are formed with external hexagonal or squared collars or flanges which serve for screwing them into and out of place with a wrench, and

when the seats are screwed into place with interposed gaskets, they form tight joints with the wall or partition between the inlet and outlet chambers.

- 5 The plugs *r* and *s* are made in different sizes to correspond with the ports in the interchangeable seats *u*, in which they have a close working fit and are formed with reversely tapered peripheral openings or passages *v* and *w*. In the plug *r* which regulates the flow of hot water, the openings or passages *v* converge toward the associated disk *m* and terminate at their apexes some distance from said disk and in the plug *s* which regulates the flow of cold water the passages *w* diverge toward and terminate at the associated disk *m*.

- 20 The stem *i* is provided with an operating handle *x* having an index or pointer *y* indicating on the cover, which is graduated or marked for the purpose, the various positions of the valves, disks and plugs for obtaining cold, warm and hot water.

- 25 The loose connections of the disks *m* with the yoke *l* compensate for any inaccuracy in workmanship and fitting, and permit the packing rings or gaskets *t* to close evenly and tightly upon the seats *u* and the plugs *r* and *s* to work freely without binding in the ports formed in said seats.

- 30 The construction shown by the drawing and hereinbefore described, provides for readily replacing either valve seat *u* and graduating plug *r* or *s* for either the hot or cold water with a seat having a port of different area and a plug of corresponding size to meet the varying conditions encountered in the installation of the device as to relative pressures and temperatures of the hot and cold water supplies. For example, the hot water graduating plug *r* and seat *u* as shown in Fig. 1 may be replaced by a plug of smaller size and a seat having a port of correspondingly smaller area as shown in Fig. 2 or vice versa, and the cold water graduating plug *s* and seat *u* as shown in Fig. 1 may be replaced by a plug of larger size and a seat having a port of larger area as shown in Fig. 2, or vice versa. Such construction also admits of the reversal of the hot and cold water connections when that is necessary or desirable, and furthermore, provides for readily renewing worn or defective parts such as the disks *m*, packing rings or gaskets *t*, seats *u* and plugs *r* and *s*.

- 55 To prevent the substitution of the cold water graduating plug *s* for a hot water plug *r* or vice versa, and accidents resulting from a mistake of this kind, the cold and hot water plugs are made with different screw threads and the stems *q* of the disks *m* are correspondingly threaded as shown in Figs. 4 and 5 so that in renewing the packing rings or gaskets or in changing graduat-

ing plugs of any given size for those of other sizes, plugs designed for regulating the supply of hot water cannot be substituted for those designed to regulate the supply of cold water to the mixing chamber or vice versa.

I claim:

1. In a mixing valve the combination of a case having inlet chambers and a mixing chamber with openings between the mixing chamber and inlet chambers, interchangeable valve seats having ports of different sizes removably secured in said openings, valves fitting into said ports and adapted to close the ports therein, and means for simultaneously operating said valves.

2. In a mixing valve the combination of a case having inlet chambers and a mixing chamber with openings between the mixing chamber and inlet chambers, interchangeable valve seats removably fitted in said openings and formed with ports of different sizes according to the conditions of pressure and temperature to which the fluids controlled by the valve are subjected, interchangeable valves comprising closing disks and graduating plugs of different sizes fitting into said ports, and means for operating said valves.

3. In a mixing valve the combination of a case having separate inlet chambers and a mixing and outlet chamber separated from the inlet chambers by partitions formed with threaded openings, interchangeable threaded seats fitted in said openings and formed with ports of different sizes, interchangeable graduating plugs of different sizes fitting said ports, and means for simultaneously operating said plugs.

4. In a mixing valve the combination of a case having inlet chambers and a separate mixing and outlet chamber communicating with the inlet chambers through openings in the intervening partition, externally flanged interchangeable valve seats removably threaded in said openings and formed with ports of different sizes, valves fitting into said ports, and means for operating said valves.

5. In a mixing valve the combination of a case having inlet chambers with supply connections and a separate mixing chamber with a discharge connection communicating with the inlet chambers through openings in the intervening partition, interchangeable valve seats removably fitted in said openings and formed with ports of different areas, interchangeable valve disks fitting said seats, graduating plugs of different sizes fitting said ports and detachably secured to said disks, a yoke with which said disks are removably connected, and an operating stem passing through the case and connected with said yoke.

6. In a mixing valve the combination with a case having separate inlet chambers and a mixing and outlet chamber communicating with the inlet chambers through ports in the intervening partition of the case, valve disks for closing said ports provided with differently threaded stems, correspondingly threaded graduating plugs fitting into said ports and removably screwed on the stems of the respective closing disks, and means 10 for simultaneously operating said disks and plugs.

In witness whereof I hereto affix my signature in presence of two witnesses.

EDWARD F. NIEDECKEN.

Witnesses:

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