

May 20, 1924.

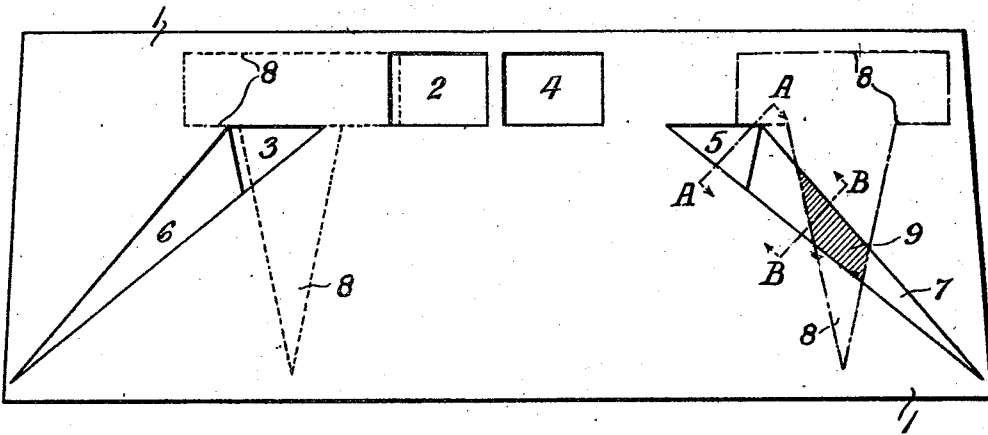
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W. E. MUNTZ

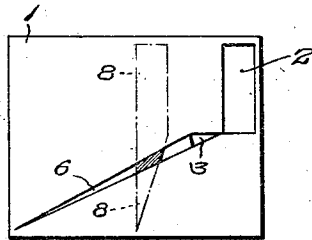
MIXING VALVE

Filed March 22, 1921

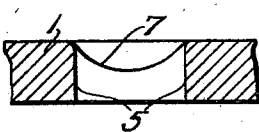
*Fig. 1.*



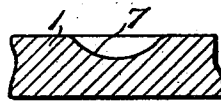
*Fig. 4.*



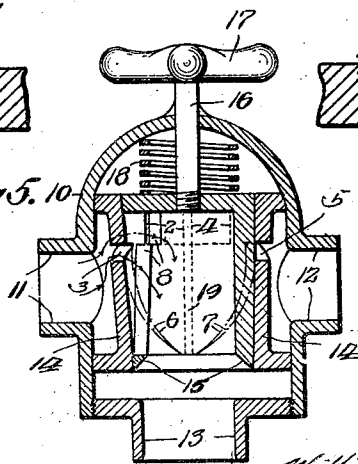
*Fig. 2.*



*Fig. 3.*



*Fig. 5.*



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*by attorney*  
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# UNITED STATES PATENT OFFICE.

WILLIAM EDGAR MUNTZ, OF LONDON, ENGLAND.

## MIXING VALVE.

Application filed March 22, 1921. Serial No. 454,552.

*To all whom it may concern:*

Be it known that I, WILLIAM EDGAR MUNTZ, a subject of the King of Great Britain, and resident of 24 Southampton Buildings, London, England, late of His Majesty's Public Works Department, India, have invented new and useful Improvements in Mixing Valves, of which the following is a specification.

This invention relates to improvements in the arrangement or shape of slots, grooves or recesses in any plate or casing such slots being adapted to slide across and inter-register with those in another plate.

One object of my invention is to obtain increased evenness of graduation more especially when triangular slots or grooves have their bases of rectangular form.

To secure this and to continue as far as may be feasible the same variation throughout of the cross-sectional area of inter-registration per unit of relative sliding movement between the two plates, I detach the triangular portion of one of a pair of inter-registering slots from its rectangular base.

The triangular portions of two slots or grooves can be made to be (and ordinarily would be) in maximum inter-registration as their rectangular shaped portions are on the point of impinging on each other, and would be so arranged that any relative movement of the sliding plates, whilst decreasing the cross sectional inter-registering area of the one is increasing that of the other, advantage being taken of the difference between the triangular and rectangular cross sectional inter-registration areas for any given unit of linear sliding movement relatively between the two plates in order to effect a more gradual total of the inter-registration cross sectional area of any pair of slots controlling one fluid only.

Where the control is for more than one fluid, it is necessary to have a separate ingress slot connected to each fluid, the corresponding inter-registering egress slot being adapted to link up the two inflows when an eventual mixture is contemplated.

In this case the rectangular shaped base of the linking up slot would ordinarily have an "overhang" on each side of its triangular portion whilst in the other inter-registering slots, the triangular portions would be entirely detached from their rec-

tangular shaped bases by a distance along the line of sliding movement equal to the amount of the "overhang" in the other slot of the pair.

I wish it however to be understood that I do not confine my invention to slots with bases of rectangular form, these being merely taken as typical examples of the advantage derived from the invention in practice.

I may also chamfer or cut away from the contiguous sliding surfaces any parts of the edges of the slots, grooves or recesses.

In the accompanying drawings which illustrate my invention, Figure 1 is a lay-out of a spigot tap for controlling two fluids; Figures 2 and 3 are sections to a larger scale on the lines A—A, B—B, Figure 1 respectively. Fig. 4 is a lay-out of a spigot tap for controlling a single fluid. Figure 5 is a vertical section of a tap provided with the slots and grooves shown in Figures 1, 2 and 3.

Referring to Figures 1, 2 and 3, 1 is a lay-out of the casing, 2 and 3 represent a rectangular and a triangular slot to which one fluid is supplied and 4 and 5 represent a rectangular and a triangular slot to which the other fluid is supplied. 6, 7 are grooves which taper in width and diminish in cross sectional area and communicate at their bases with the slots 3 and 5 respectively. 8 represents a slot in the spigot the upper part of the slot being rectangular whilst the lower part is triangular. The hatched or shaded part of the drawing 9; in Figure 1, represents the area of inter-registration, when the slot 8 in the spigot is in the position shown, of the groove 7 with the slot 3, fluid entering the slot 5 in the casing 1 passing along the groove 7 and through the slot 8 in the spigot.

If the spigot were turned so as to move the slot 8 to the right in Figure 1 until the apex of the triangular portion of the slot 8 coincided with the apex of the groove 7, no fluid would flow through the slot 8. If then the spigot were turned so as to move the slot 8 to the left in Figure 1, there would be a gradually increasing area of inter-registration between the triangular portion of the slot 8 and the triangular groove 7 and later between the triangular portion of the slot 8 and the groove 7 and slot 5, and there would be a gradually in-

creasing flow of liquid. When the base of the triangular part of the slot 8 coincides with the base of the triangle formed by the groove 7 and slot 5 the rectangular part of the slot 8 is about to meet the slot 4, consequently as the slot 8 is moved further to the left there will be inter-registration between the rectangular part of the slot 8 and the rectangular slot 4, which area will increase whilst the area of inter-registration between the slot 8 and the slot 5 will decrease until the whole of the slot 4 registers with the slot 8 which latter ceases to register with the slot 5. In this position there flows the full supply of one fluid through the slot 4, the flow of the other fluid through the slots 2 and 3 being up till now cut off. As the slot 8 is moved further to the left the slot 8 registers to an increasing extent with the slot 2 thereby allowing an increasing amount of the second fluid to flow through the slot 8, the full amount of the first fluid continuing to flow. When the slot 8 registers with the whole of the slots 2 and 4 there will be the maximum flow of each fluid through the slot 8 whilst as the slot 8 is moved to the left the flow of liquid through the slot 4 will gradually be cut off, and when entirely cut off the flow of fluid through the slot 2 and subsequently the slot 3 and groove 6 will be gradually cut off until the apex of the slot 8 coincides with the apex of the groove 6 in which position the fluid will be entirely cut off.

Preferably there is a slight gap between the apices of the grooves 6 and 7 which forms a cut off position. The grooves 6 and 7 may have their edges chamfered or rounded off as shown in Figures 2 and 3.

Referring now to Figure 4, similar parts have similar letters.

In this modification it will be seen that the most forward corner of the triangular part of the groove and slot 6, 3, is just in line (at right angles with the direction of movement) with the most backward or nearest part of its rectangular base 2. The spigot slot 8, as in Figure 1, has its upper part rectangular and its lower part triangular. If the spigot slot 8 be moved to the right (in Figure 4) as soon as the rectangular part of the slot 8 commences to overlap the rectangular base 2 of the casing slot, the inter-registering cross sectional area of the rectangular part of the slot 8 and the rectangular base 2 of the casing slot will increase as the slot 8 is moved to the right and the inter-registering cross sectional area of the triangular part of the slot 8 and the triangular part of the groove 6 or slot 3 in the casing will decrease.

Referring now to Figure 5, 10 is the casing of a plug or spigot tap having an inlet port 11 for cold water and an inlet port 12 for hot water. 13 is an outlet for the mix-

ture of hot and cold water. 14 is a sleeve fitting in the casing 10 and containing a conical plug or spigot 15. The plug 15 is provided with a spindle 16 and an actuating handle 17. 18 is a spring which keeps the plug 15 in contact with the sleeve 14. 19 is a partition or dividing wall between the casing 10 and the sleeve 14.

What I claim is:—

1. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, and one of said elements including a triangular slot detached from the remainder of its slotted portion.

2. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, and one of said elements including a rectangular and triangular slot detached from each other.

3. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, one of said elements including a rectangular and triangular slot detached from each other, and the other of said elements including a slot having a rectangular base portion adapted to inter-register with the rectangular slot of the first named element.

4. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, one of said elements including a rectangular and triangular slot detached from each other, and the other of said elements including a slot having a triangular portion adapted to inter-register with the triangular slot of the first named element.

5. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, one of said elements including a rectangular and triangular slot detached from each other, and the other of said elements including a slot having a rectangular base portion adapted to inter-register with the rectangular slot of the first named element and having a triangular portion adapted to inter-register with the triangular slot of the first named element.

6. In an arrangement for controlling fluid flow, a pair of elements movable with respect to each other, each of said elements being provided with slots, said slots being adapted to inter-register as the elements are moved with respect to each other, and one of said elements including a triangular slot detached from the remainder of its slotted portion, the contiguous edges of said slots being chamfered. 10

In testimony that I claim the foregoing as my invention I have signed my name this fourth day of March, 1921.

WILLIAM EDGAR MUNTZ.