C. R. KADDELAND.

DUAL ADJUSTING MECHANISM FOR INK FOUNTAINS, &c.

APPLICATION FILED DEC. 3, 1917.

1,273,498.

Patented July 23, 1918.

3 SHEETS—SHEET 1.

Fig. 1.

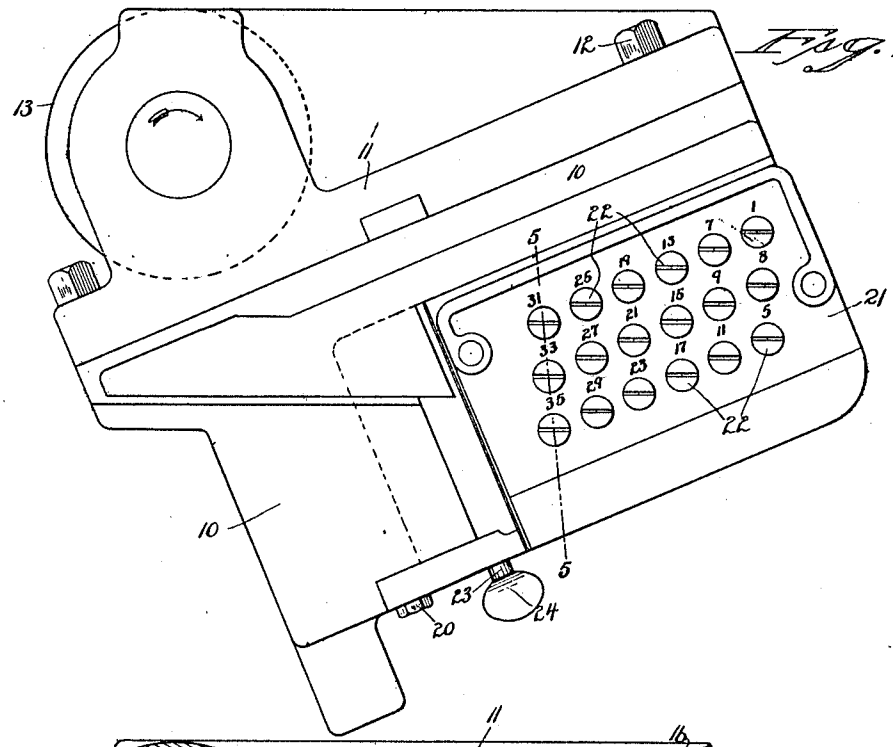
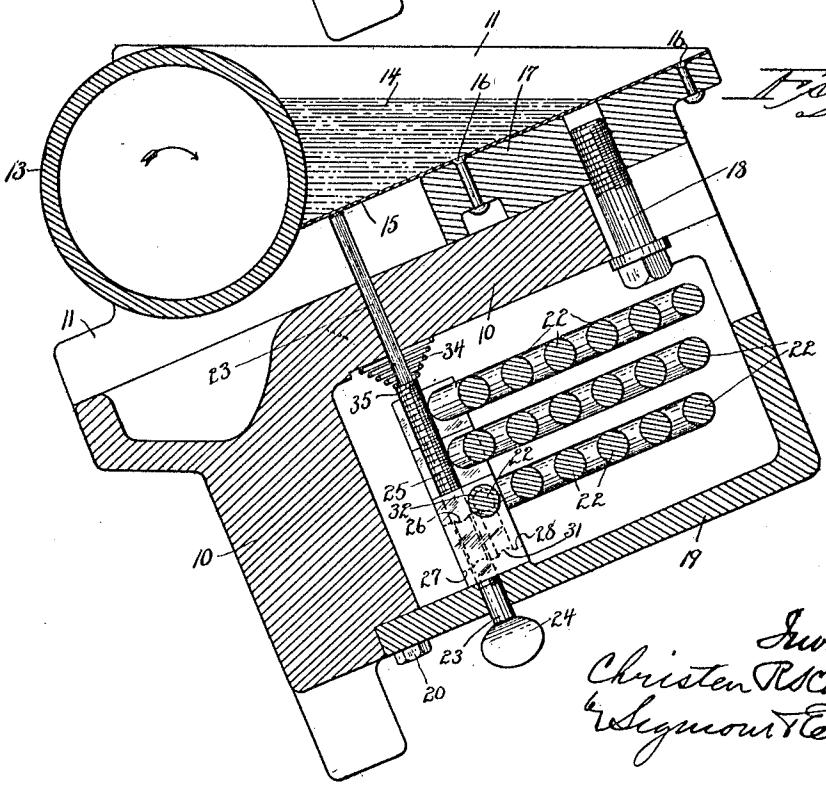


Fig. 2.



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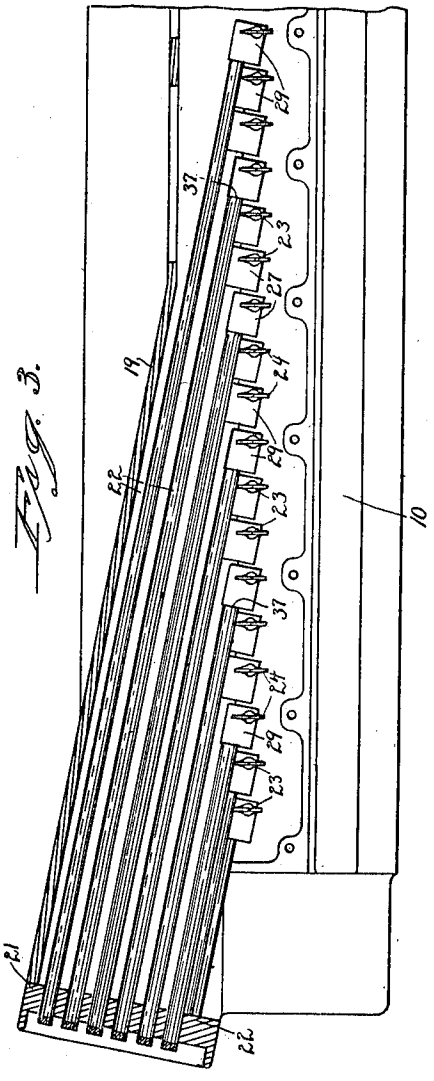


Fig. 3.

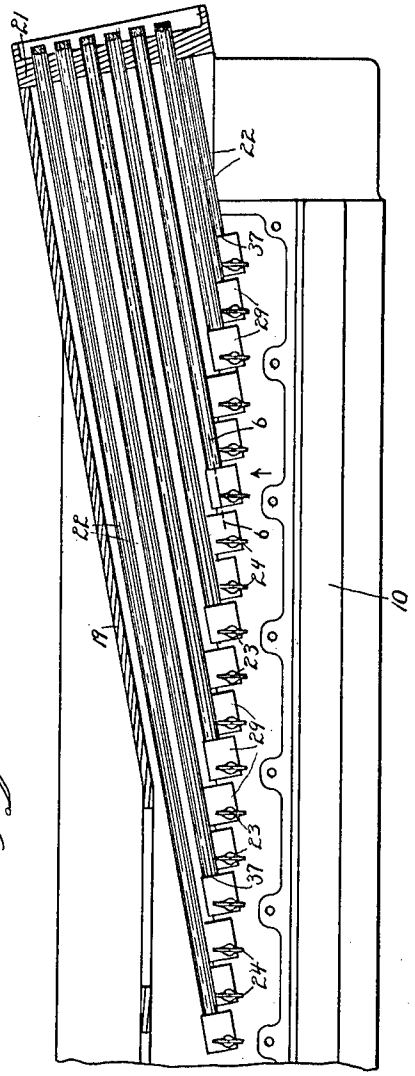


Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 5.

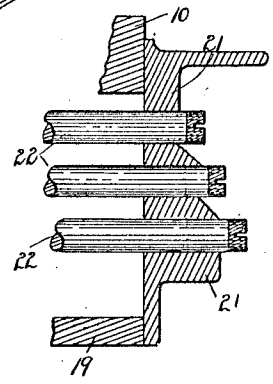


Fig. 6.

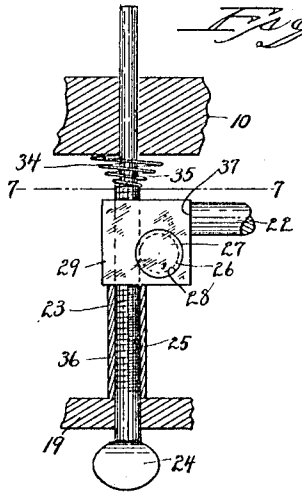


Fig. 7.

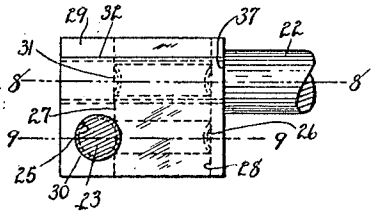


Fig. 8.

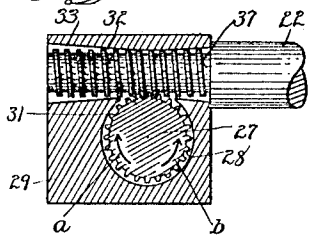


Fig. 9.

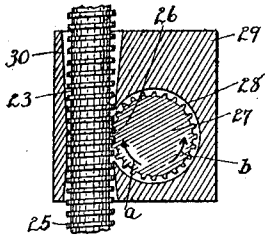
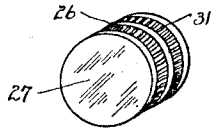


Fig. 10.



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UNITED STATES PATENT OFFICE.

CHRISTEN R. KADDELAND, OF SHELTON, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO PREMIER PRINTING MACHINERY CO., OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

DUAL ADJUSTING MECHANISM FOR INK-FOUNTAINS, &c.

1,273,498. Specification of Letters Patent. Patented July 23, 1918.

Application filed December 3, 1917. Serial No. 205,025.

To all whom it may concern:

Be it known that I, CHRISTEN R. KADDELAND, a citizen of the United States, residing at Shelton, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Dual Adjusting Mechanism for Ink-Fountains, &c.; and I do hereby declare the following, when taken in connection with the accompanying drawings and the characters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this application, and represent, in—

Figure 1 a view in end elevation of my improved dual adjusting mechanism applied to an ink fountain.

Fig. 2 a view thereof in vertical transverse section.

Fig. 3 a reverse plan view of one half of the fountain.

Fig. 4 a corresponding view of the complementary half thereof.

Fig. 5 a detail sectional view on the line 5—5 of Fig. 1.

Fig. 6 a broken detail sectional view on the line 6—6 of Fig. 4, showing one of the adjusting units.

Fig. 7 a horizontal sectional view on the line 7—7 of Fig. 6.

Fig. 8 a sectional view on the line 8—8 of Fig. 7.

Fig. 9 a sectional view on the line 9—9 of Fig. 7.

Fig. 10 a detached perspective view of one of the double worm wheels.

My invention relates to an improved dual adjusting mechanism for ink fountains, etc., the object being to provide a mechanism in which the secondary adjustment is made as sensitive as the primary adjustment, both adjustments being extremely sensitive.

With these ends in view, my invention consists in the combination with two interdependent adjusting screws, of connecting means interposed directly between the said screws and constantly having absolute engagement with both of them, and a spring for forcing one of the adjusting screws in one direction, whereby back-lash between them and the said connecting means is eliminated.

My invention further consists in certain details of construction as will be hereinafter described and pointed out in the claims.

As herein shown, my invention is applied to an ordinary type of ink fountain the bowl of which consists of a base 10 and cheeks 11 secured to the ends thereof by bolts 12. The inking roller 13 is journaled at its ends in the said cheeks and revolves in a body of ink 14 confined within the bowl. The distribution of the ink upon the roller, that is to say, the thickness of the film of ink removed by the roller from the body of ink is regulated by a knife or blade 15 secured by rivets 16 to a heavy cross-bar 17 parallel with the axis of the roller and secured by bolts 18 to the base 10 aforesaid. A housing 19 secured to the base 10 by the bolts 18 and also by bolts 20 incloses the adjusting units to be hereinafter described, the said housing being closed at its ends by end-pieces 21 which provide bearings for the projecting outer ends of the secondary adjusting screws 22.

My improved dual adjusting mechanism as herein applied provides for adjusting the edge of the blade 15 with reference to the periphery of the roller 13 so as to regulate the thickness of the film of ink removed by the roller from the body of ink in the bowl. For this purpose I employ a series of regularly spaced rotatable and also longitudinally movable primary adjusting screws 23 arranged well toward the edge of the blade in a line parallel to the axis of the roller 13. The reduced upper ends of these screws have bearing in the base 10, while their lower ends have bearing in the housing 19. The extreme upper ends of the screws impinge directly upon the lower face of the blade 15; their extreme lower ends project downward through the housing 19 and are furnished with wing heads 24 by means of which the individual screws are manually turned for the primary adjustment of the blade for the secondary adjustment of which they are bodily moved longitudinally as will be explained later on. The central portion of

each of the screws 23 is formed with worm-threads 25 engaged by the worm-teeth 26 of a plug-like double worm wheel 27 turning in a cylindrical chamber 28 in a worm-wheel block 29 traversed by a passage 30 arranged at a right angle to the axis of the said chamber 28 and providing for the passage through it of the primary adjusting screw 23 by which it is positioned. The said worm-wheel 27 is provided with a second set of worm-teeth 31 corresponding in number and pitch to the worm-teeth 26 and engaged by worm-threads 32 formed upon the reduced inner ends of the complementary secondary adjusting screw 22. For the reception of the threaded inner end of the secondary screw 22 the worm-wheel block 29 is formed with a passage 33 which extends at a right angle to the passage 30 formed in it for the reception of the primary adjusting screw 23. The passage 33 also extends at a right angle to the chamber 28 aforesaid. The secondary screw 22 therefore prevents the block 29 from turning upon the primary screw 23, while on the other hand the passage of the primary screw 23 through the passage 30 prevents the block 29 from turning with respect to the secondary screw 22. The downward pressure of the blade 15 upon the end of the primary screw 23 is supplemented as shown by a helical spring 34 interposed between the base 10 and a shoulder 35 upon the primary screw. The downward pressure of the blade 15 and the spring 34 upon the primary screw 23 is ultimately taken by the housing 19 upon which the worm-wheel block 29 rests either directly or indirectly. Some of the blocks 29 rest directly upon the housing, and some are supported above the same by spacing sleeves 36 as shown in Fig. 6, the sleeves 36 being of two lengths as required for arranging the secondary adjusting screws 22 in banks of three for compactness.

It will be understood from the foregoing, that the adjusting means of the fountain consist of a series of adjusting units, each comprising a primary adjusting screw, a secondary adjusting screw, a worm-wheel directly meshed into by both screws, and a worm-wheel block positioned upon the screws and carrying the worm-wheel. As shown, each unit has a supplemental spring, but this is not essential, although I regard it as desirable.

The operation of my improvement is as follows: In adjusting the fountain by means of the primary adjusting screws 23, the double worm-wheels 27 are held against rotation by the engagement of their worm-teeth 31 with the worm threads 32 of the secondary adjusting screws 22, whereby the worm teeth 26 of the said worm-wheels 27 function as nuts for the primary adjusting screws 23 which are manually turned by their wing heads 24. In this manner the primary adjusting screws 23 are turned and so lifted against the blade 15 for its adjustment to decrease the amount of ink taken up by the inking roller 13. To increase the amount of ink supplied to the roller at any point, the properly located screw 23 is turned in the reverse direction, whereupon the blade 15 moves away from the periphery of the roller to the same extent. On the other hand, when any one of the secondary adjusting screws 22 is turned the worm-threads 32 at its inner end through their engagement with the worm-teeth 31 of its complementary double worm-wheel 27, will effect the rotation of the wheel in the direction of the arrow *a* in Figs. 8 and 9, the shoulder 37 of the screw 22 bearing at this time upon the adjacent face of the block 29. As the worm-wheel 27 rotates, its worm-teeth 26 function as pinion teeth in conjunction with the worm-threads 25 of the complementary adjusting screw 23 for bodily raising the same without rotating it so as to effect the adjustment of the blade 15, in the same manner and to the same extent as though one of the primary adjusting screws were being operated. In other words, when the primary adjusting screws 23 are turned for the adjustment of the blade, the worm-wheels 27 are held stationary to function as nuts for them, by the secondary adjusting screws 22, while when the secondary adjusting screws 22 are turned for the adjustment of the blade, the worm-teeth 26 of the worm-wheels 27 act as pinions for bodily lifting the primary adjusting screws 23 then virtually functioning as racks. When it is desired to increase the amount of ink supplied to the roller by the adjustment of any one or more of the secondary adjusting screws 22, they are reversely turned against the tension of the blade and the supplemental spring 34 which will continue to maintain the driving faces of the worm-threads and worm-teeth in constant absolute engagement, the turning of the worms being then against the tension of the blade and springs. At this time the worm-wheel 27 will be turned in the direction of the arrow *b* in Figs. 8 and 9.

All back-lash as to the primary screw 23 or the secondary screw 22 of any one of the adjusting units, is taken up by the tension of the blade 15, and the supplemental spring 34 which by pressing downward upon the primary adjusting screw 23 causes the driving faces of the worm-threads of both screws to be maintained in absolute contact with the driving faces of the complementary worm-teeth 26 and 31 of the worm-wheel 27. The tension of the blade 15 and of the spring 34 also maintains the shoulder 37 of the secondary adjusting screw 22 in absolute contact with the adjacent face of the block 29. The described interdependence of

the two screws permits the back-lash to be eliminated as to both of them by spring pressure in one direction upon one of them, this being due to the fact that the spring pressure maintains the driving faces of the threads of both screws in constant absolute engagement with the driving faces of the teeth of the worm-wheel which is directly interposed, as it were, between the screws. From this it follows that the adjustment of the blade 15 through the secondary adjusting screws, is just as sensitive an adjustment as the adjustment of the blade through the primary adjusting screws.

While my improved dual adjusting mechanism has been shown as applied to an ink fountain, it is apparent that it may be used in other situations calling for extremely sensitive dual adjustments.

I claim:—

1. In a dual adjusting mechanism, the combination with two interdependent adjusting screws, of connecting means interposed directly between the said screws and constantly having absolute engagement with both of them, and a spring for forcing one of the adjusting screws in one direction, whereby back-lash between them and the said connecting means is eliminated.

2. In a dual adjusting mechanism, the combination with two interdependent adjusting screws having worm-teeth, of a worm-wheel constantly engaged by both of the said screws, and a spring for forcing one of the said screws in one direction and hence maintaining the driving faces of the worm-threads of the screws and the worm-teeth of the wheel in a constant absolute engagement, whereby back-lash is eliminated as to both screws.

3. In a dual adjusting mechanism, the combination with two interdependent adjusting screws, of a worm-wheel with which both of the said screws are constantly in absolute engagement, a block mounting the said worm-wheel and traversed by both of the said screws for being held against rotation upon either of them, and a spring for forcing one of the screws in one direction whereby back-lash between them and the said wheel is eliminated.

4. In a dual adjusting mechanism, the combination with two interdependent adjusting screws, of a double worm-wheel having two interdependent sets of worm-teeth respectively maintained in concurrent absolute engagement with the threads of the respective screws, and a spring for constantly forcing one of the said adjusting screws in one direction, whereby back-lash between them is eliminated.

5. In a dual adjusting mechanism, the combination with two adjusting screws one of which has a rotary movement while the other remains stationary, of a worm-wheel having concurrent engagement with both of said screws and so rendering their action interdependent, and tension means for maintaining absolute engagement between the said adjusting screws and worm-wheel.

6. In an ink fountain, a series of self-contained dual adjusting units each comprising a primary and a secondary adjusting screw, and means interposed between the said screws whereby the primary adjusting screw is sustained by the secondary screw.

7. In an ink fountain, a series of self-contained dual adjusting units each comprising a primary and a secondary adjusting screw and also comprising means interposed between the said screws for rendering their action interdependent, whereby the primary screw is moved lengthwise bodily without rotation by the action of its complementary secondary screw.

8. In an ink fountain, the combination with an ink roller, of a blade therefor, two adjusting screws, and a worm-wheel interposed between the said adjusting screws, one of the adjusting screws being adapted to be rotated, while the other remains stationary.

9. In an ink fountain, the combination with the blade thereof, of a primary adjusting screw engaged therewith, a worm gear the teeth of which are maintained in absolute engagement with the threads of the said screw, a secondary adjusting screw the threads of which are also maintained in absolute engagement with the teeth of the said worm gear, whereby the action of one screw is dependent upon the action of the other screw, and vice versa, the primary adjusting-screw being manually rotated for the primary adjustment of the blade, and for the secondary adjustment of the blade, bodily moved longitudinally without rotation by the operation of the secondary adjusting screw.

10. In an ink fountain, the combination with the blade thereof, of a primary adjusting screw, a secondary adjusting screw, a worm-wheel directly interposed between said screws and having concurrent absolute engagement with both of them, and a spring reinforcing the action of the blade in forcing the primary screw in one direction, the action of the screws being interdependent.

11. In a dual adjusting mechanism, the combination with two adjusting screws one of which has rotary movement and also non-rotary longitudinal movement, and the other of which is confined to rotary movement, of a worm-gear having concurrent engagement with both of said screws and rendering their action interdependent, and a spring for forcing the longitudinally movable screw in one direction.

12. In an ink fountain, the combination with a primary adjusting screw having rotary movement and also longitudinal non-

rotary movement, of a secondary adjusting screw confined to rotary movement, a worm-gear having concurrent absolute engagement with the threads of both of the said screws, a block mounting the said gear and traversed at right angles by both of the said screws, the secondary screw being shouldered to engage with the said block to prevent it from longitudinal movement with respect thereto, and a spring exerting a constant effort to move the primary screw longitudinally.

In testimony whereof, I have signed this specification.

CHRISTEN R. KADDELAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."