

June 10, 1941.

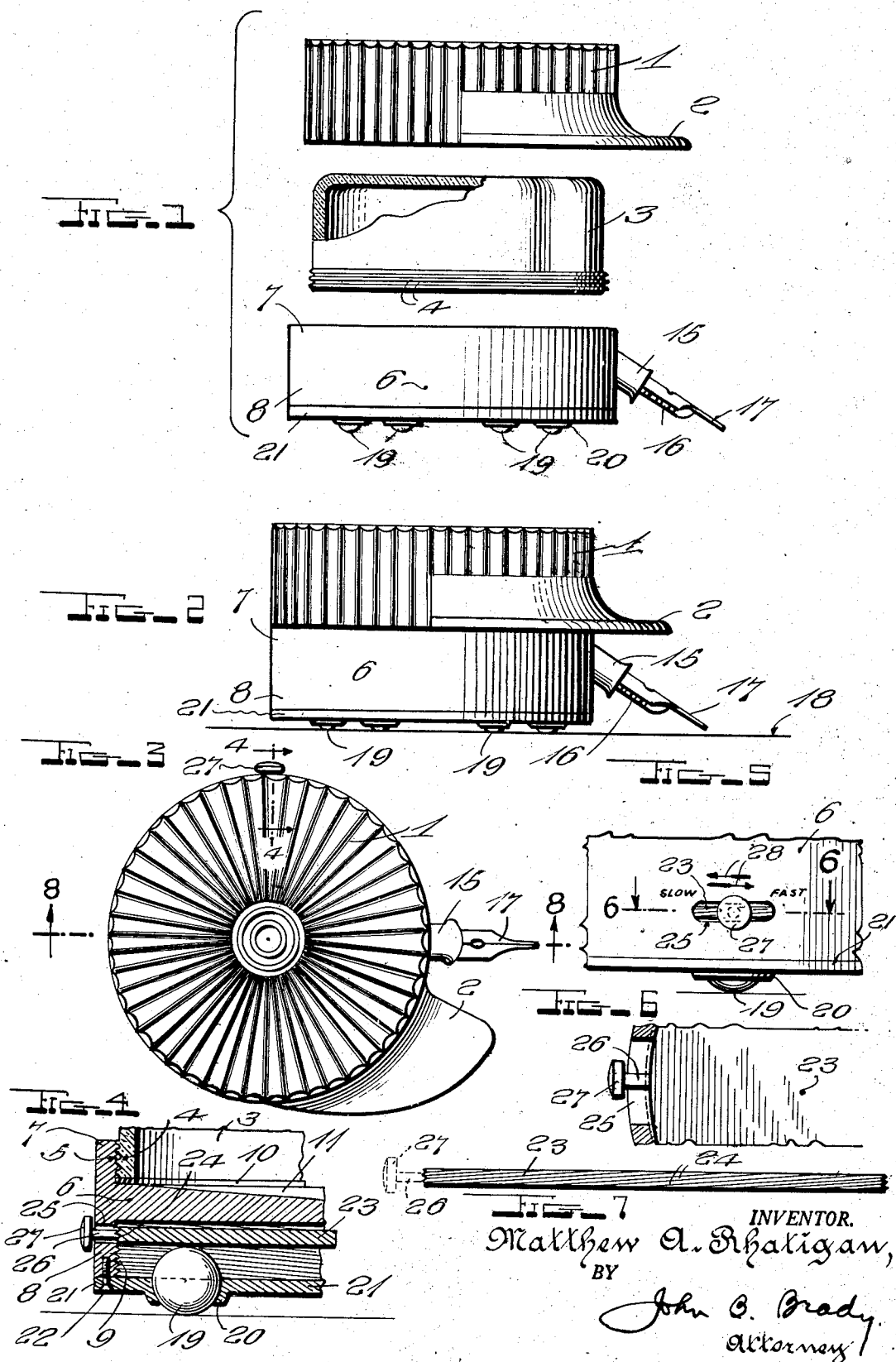
M. A. RHATIGAN

2,245,116

FOUNTAIN PEN

Filed Sept. 13, 1940

2 Sheets-Sheet 1



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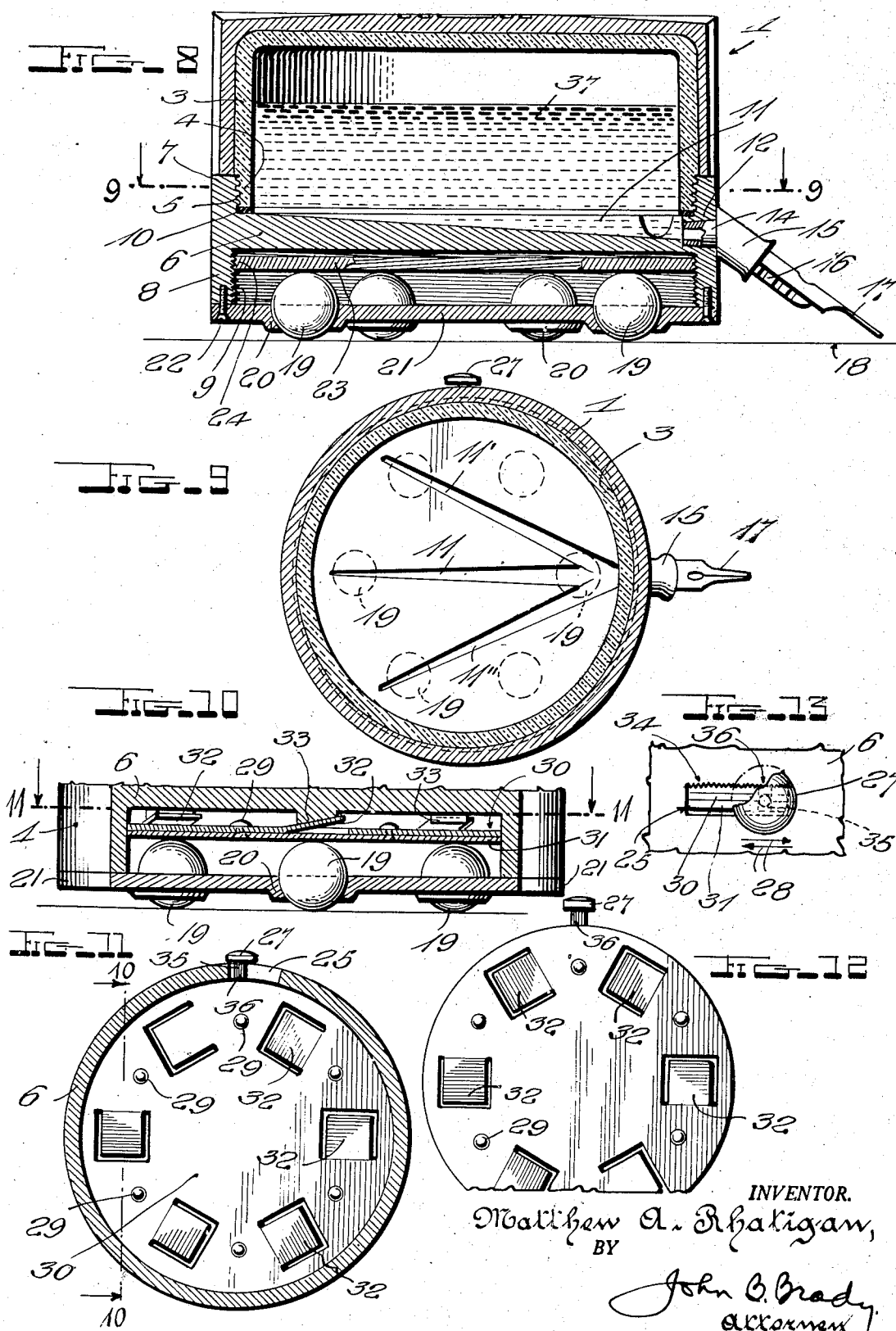
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UNITED STATES PATENT OFFICE

2,245,116

FOUNTAIN PEN

Matthew A. Rhatigan, New York, N. Y.

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12 Claims. (Cl. 120—42)

My invention relates broadly to fountain pens and more particularly to an improved construction of reservoir pen of compact inexpensive construction and capable of rapid writing.

One of the objects of my invention is to provide an efficient form of writing device adapted for various applications; such as, the stylus of an indicating recorder, a device for quickly drawing topographic sections, architectural and aircraft structure drafting, cartooning, and for drawing and writing generally.

Another object of my invention is to provide an arrangement of writing device in which a closure and supporting member may be secured to the screw threaded top of an inverted ink bottle, whereby the ink bottle serves as a reservoir for supplying ink to a writing point carried by the supporting member.

A further object of my invention is to provide a construction of writing device in which a reservoir connected with a writing pen point may be covered by a protective member serving as a rest for the hand or fingers for relieving strain upon the wrist, fingers and forearm, thus enabling the writer to have freedom for concentration and ease of operation of the writing device.

Another object of my invention is to provide a construction of writing device having a compact body structure for supporting both the writing point and a reservoir for ink with means on the body structure for guiding the structure over a flat surface for facilitating rapid writing with the device.

Still another object of my invention is to provide a construction of molded support for a writing device including a pen point and reservoir for ink in which supporting ball-bearings are mounted in the supporting structure with means for subjecting the bearings to variable friction, thereby controlling the rate of movement at which the writing device is capable of being moved over the writing surface, and conforming the device to the writing characteristics of different individuals.

Other and further objects of my invention reside in the arrangement of rapid writing device set forth more fully in the specification hereinafter following by reference to the accompanying drawings in which:

Figure 1 is a side elevational view of the principal parts of the writing device of my invention, the parts being shown in spaced positions one above the other prior to assembly; Fig. 2 is a side elevational view of the device shown in

Fig. 1, the parts being shown in assembled relation; Fig. 3 is a top plan view of the device; Fig. 4 is a fragmentary sectional view taken substantially on line 4—4 of Fig. 3 and showing the variable friction control means for governing the movement of the pen with respect to a writing surface; Fig. 5 is a fragmentary side elevational view showing the adjustment member for controlling the friction on the bearing means in the writing device for controlling the rate of movement thereof with respect to a writing surface; Fig. 6 is a fragmentary transverse sectional view on line 6—6 of Fig. 5; Fig. 7 is a side elevational view of the variable friction plate used in the form of my invention shown in Figs. 1—6; Fig. 8 is a vertical sectional view through the device of my invention on enlarged scale, taken substantially on line 8—8 of Fig. 3; Fig. 9 is a transverse sectional view through the writing device taken substantially on line 9—9 of Fig. 8 and illustrating the arrangement of the ink feeding means for supplying ink to the capillary pen constituting the writing device; Fig. 10 is a fragmentary vertical sectional view taken on line 10—10 of Fig. 11, showing a modified arrangement of friction brake device moved to a position for imposing sufficient restraint upon the bearings to enable the speed of the pen to be reduced to meet the writing characteristics of various writers; Fig. 11 is a transverse sectional view taken substantially on line 11—11 of Fig. 10; Fig. 12 is a top plan view of the friction cam plate used in the modified form of my invention shown in Fig. 10; and Fig. 13 is a fragmentary side elevational view of the friction adjustment means used in the structure of Figs. 10—12.

Referring to the drawings in detail, reference character 1 designates the inverted cup shaped fluted ornamental cover employed for the writing device of my invention and illustrates the extension 2 which constitutes in coaction with the cover 1, means for resting the fingers immediately adjacent the writing device and relieving strain upon the wrist, fingers and forearm, thus enabling the writer to have freedom for concentration and promoting ease of operation of the pen. The inverted cover 1 fits over the inverted bottle 3 which is provided with screw threads 4 adjacent the periphery thereof to engage corresponding screw threads 5 formed in the molded body structure 6. The molded body structure 6 constitutes the closure and the supporting means or unit of the writing device of my invention. This closure or supporting

unit has an upstanding or vertical cylindrical portion 7 containing the internal screw threads 5 and a depending cylindrical portion of skirt 8 which is also internally screw-threaded, indicated at 9. The upper screw-threaded portion 7 receives the screw-threaded periphery 4 of the inverted ink bottle 3 which is seated against annular gasket 10 preventing leakage of ink externally of the body structure 6 and enabling the supply of ink to be controlled through angularly extended passages 11, 11' and 11'', which converge into the bore 12 at the side of the body structure 6. The bore 12 receives the tubular plug portion 14 of the angularly disposed member 15 that supports the capillary 16 to which penpoint 17 connects. The penpoint 17 is angularly disposed with respect to the body support 6 to engage the writing surface indicated generally at 18.

The writing device is supported with respect to the writing surface by means of ball-bearings 19 which are supported in sockets shown at 20 in horizontally extending circular plate 21. The sockets 20 are rounded to serve as seats for the portions of ball-bearings 19 that do not project through the plate 21. The plate 21 is secured in any suitable manner to the periphery of the depending cylindrical skirt 8 of body structure 6 such as, for example, by means of screws 22. The upper surface of ball-bearings 19 may be frictionally engaged by means of angularly shiftable plate 23 which is screw threaded at its periphery 24 to engage the internal screw threads 9 of the depending cylindrical skirt 8. The wall of the depending cylindrical skirt 8 is slotted through a small sector thereof as indicated at 25 for the passage of lever 26 having a finger engaging knob 27 thereon. The lever 26 is shiftable, as indicated by arrows 28, through a sufficient angular distance limited by the slot 25 to enable friction plate 23 to be advanced or retracted against the upper surface of ball-bearings 19, thereby varying the rate at which these ball-bearings are free to revolve and correspondingly controlling the rate at which the writing device may be moved over the writing surface. The exterior of the cylindrical surface of the supporting member 6 is suitably engraved with the words, "slow" and "fast," marking the limits of movement of lever 26 to permit various rates of movement of the writing device to be selected at will. It will be understood that in assembling the structure, the plate 23 is so set that the plate forms a permanent backing member with respect to the ball bearings 19 tending to maintain the ball bearings in the sockets 20 of circular plate 21. The degree of friction depends upon the advancing or retracting of plate 23 in the screw threads 9 in the interior of the cylindrical skirt 8.

I may provide a modified arrangement for controlling the friction on the ball bearings 19 as illustrated in Figs. 10-13. Instead of threading the interior of the skirt 8 I permit the wall to remain smooth and insert within this wall a pair of interconnected disc members illustrated at 30 and 31. The disc members 30 and 31 may be riveted, welded or soldered as indicated at 29 forming an interconnected unit. The disc member 30 contains a multiplicity of up-struck projections 32 arranged in an annular path as shown in Figs. 10 and 12. These up-struck projections 32 coact with downwardly extending cam faces 33 formed integral with the body structure 6. Lever 26 which extends from one side of the

disc assembly 30-31 projects through slot 25 in the side wall of body structure 6 terminating in finger engaging knob 27 permitting the disc assembly 30-31 to be angularly shifted. The up-struck projections 32 serve as cam members riding upon the surfaces of downwardly extending cam faces 33, thereby advancing or retracting disc 31 and increasing or decreasing pressure on the ball bearings 19, thereby controlling the rate of movement of the ball bearings. The up-struck projections 32 are each resilient so that a yieldable force is applied between disc 31 and the ball bearings 19 yieldably urging ball bearing 19 into the sockets 20. Lever 26 may be shaped to engage serrations 34 in the upper portion of slot 25 so that the disc members 30 and 31 may be fixed in the position to which the disc members are shifted. In lieu of the shaping of the lever 26 I may provide a small collar member indicated in dotted lines at 35 in Fig. 13 which has a serrated face 36 engageable with the serrations 34 for maintaining the discs 30-31 in a selected set position. The lever 26 and finger engaging knob 27 may be moved downwardly to a sufficient degree to permit release of lever 26 of serrated face 36 of member 35 thereon, with respect to serrations 34 in slot 25 and shifting of the disc members 30-31. To permit this adjustment within the limits of slot 25 in either direction indicated by arrows 28, the serrations 34 and engaging serrations 36 are quite shallow.

For purposes of explaining my invention I have shown the extension 2 which serves as a rest for the fingers and relieves strain upon the wrist, fingers and forearm in a somewhat elevated position. This position of the finger rest has been illustrated at a somewhat higher elevation for convenience in showing the capillary 16 and pen point 17. It will be understood that the finger rest 2 may be lowered by merely extending the inverted cover 1 to a position close to the pen point. The capillary 16 forms an important part of the structure of my invention for insuring the uniform feeding of ink to the pen point 17. Due to the fact that the writing device is continuously agitated during a writing operation, the ink 37 from reservoir 3 is readily fed through capillary action to the pen point 17.

When substantially all of the ink has been consumed the device is refilled by inverting the device, removing the cover 1, and unscrewing the inverted bottle 3. The inverted bottle is then either refilled or a renewal bottle is screwed in position against gasket 10, the cover 1 restored and the device restored to its normal position on the writing surface.

The writing device of my invention is particularly applicable for court reporting where shorthand notes must be rapidly and accurately taken. The arrangement of the cover portion of the device shown at 1 and 2 is such as to relieve strain upon the wrist, fingers and forearm, eliminating spasmodic muscular contraction of the forearm and avoiding fatigue to a large degree.

In the preparation of architectural plans and in cartooning work where rapid shading is required, the device of my invention is particularly suitable. In the laying out of aircraft plans the device of my invention is a very substantial time saver. In the preparation of topographic sections in map drawing, the writing device of my invention substantially reduces drafting time normally required.

A number of writing devices of this type may

be employed containing ink reservoirs filled with different colored inks so that ink writing devices of different colors are immediately and continuously available in the laying out of plans requiring different colored inks.

The writing operation which is performed by the writing device of my invention is substantially an oscillatory movement of the writing device over the writing surface. Because the writing device is mounted on roller-bearings engageable upon the writing surface it is possible to effect rapid movement of the writing device by oscillatory motion of the device as a whole over the writing surface.

While I have described my invention in certain of its preferred embodiments, I realize that various modifications may be made and I intend no limitations upon my invention other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A writing device comprising a supporting member, a rigid container for ink, screw threaded connection means for attaching said rigid container for ink to said supporting member, means for preventing leakage of ink between said supporting member and said screw threaded connection means, a pen carried by said supporting member, means for supplying ink to said pen point from said container, means for mounting said supporting member for free oscillatory movement over a writing surface engageable by said pen point comprising a multiplicity of revoluble roller members and yieldable means interposed between said roller members and said supporting member.

2. A writing device comprising a supporting member, roller bearings carried by said supporting member, means for yieldably urging said roller bearings toward a writing surface for oscillatory movement thereover, a pen point supported from said supporting member for engaging the writing surface adjacent said roller bearings, a rigid container for ink carried by said supporting member, having an ink delivery orifice therein, an annular gasket disposed between the peripheral edge of the orifice of said container and said supporting member for preventing leakage of ink from said container over said supporting member, and means for feeding ink from said container to said pen point.

3. A writing device comprising a supporting structure having an upwardly extending internally screw threaded skirt and a downwardly depending screw threaded skirt, an inverted ink bottle engageable by said first mentioned skirt, a pen point carrier connected with said support, a pen point in said carrier connected through a passage with said inverted ink bottle, means for mounting a multiplicity of ball bearings with respect to said depending skirt, and means engageable with the internal screw threads of said depending skirt for variably imposing friction upon said ball bearings for controlling the rate of movement thereof over the writing surface.

4. A writing device comprising a supporting structure, revoluble roller means for mounting said supporting structure for oscillatory movement with respect to a writing surface, yieldable means interposed between said supporting structure and said revoluble roller means, mounting means for a pen carried by said support, a pen point disposed in said mounting means, a rigid inverted ink container connected with said support, a sealing gasket interposed between the

periphery of said container and said support and means for feeding ink from said inverted ink container to said pen point.

5. A writing device comprising a support, means for mounting said support for oscillatory movement with respect to a writing surface, a pen point mounting means carried by said support, a pen point mounted in said pen point mounting means, a reservoir for ink comprising an open ended rigid walled container carried by said support with the open end thereof in communication with the pen point in said pen point mounting means, and a removable cover member engageable with said reservoir, said cover member having a wrist and finger rest integrally connected therewith.

6. A writing device comprising a support, means for mounting said support for oscillatory movement with respect to a writing surface, a pen point carried by said support for engaging a writing surface in a position adjacent the mounting means, ink supply means carried by said support and connected with said pen point, and variable friction means for controlling the rate of movement of said support over the writing surface.

7. A writing device comprising a supporting member arranged for oscillatory movement with respect to the writing surface, a reservoir for ink carried by said member, a capillary feed point connected with said reservoir, and adjustable means for controlling the rate of oscillatory movement of said supporting member with respect to said writing surface.

8. A writing device comprising a support, means for mounting said support for oscillatory movement with respect to a writing surface, a pen point carried by said support for engaging a writing surface in a position adjacent the mounting means, ink supply means carried by said support and connected with said pen point, a multiplicity of ball bearings engageable with a writing surface secured in spaced positions to the lower extremity of said support, and means for applying variable friction to said ball bearings for controlling the rate of movement of the ball bearings over the writing surface.

9. A writing device comprising a support, means for mounting said support for oscillatory movement with respect to a writing surface, a pen point carried by said support for engaging a writing surface in a position adjacent the mounting means, ink supply means carried by said support and connected with said pen point, said first mentioned means comprising a multiplicity of ball bearings engageable with the writing surface, and screw threaded adjustable means for controlling the rate of movement of said ball bearings with respect to said writing surface.

10. A writing device comprising a supporting structure, means for mounting said supporting structure for oscillatory movement with respect to a writing surface, mounting means for a pen carried by said support, a pen point disposed in said mounting means, an inverted ink bottle connected with said support, means for feeding ink from said inverted ink bottle to said pen point, a multiplicity of cam members extending from said support, a cam plate engageable with said cam members, and a multiplicity of ball bearings against which said cam plate imposes variable friction.

11. A writing device comprising a supporting member, means for attaching an inverted ink reservoir to said supporting member, a pen carried

by said supporting member, means for supplying ink to said pen point from said reservoir, means for mounting said supporting member for free oscillatory movement over a writing surface engageable by said pen point comprising a plurality of ball bearings, a plate for mounting said ball bearings, and a variable friction device interposed between said supporting member and said ball bearings.

12. A writing device comprising a supporting member, means for attaching an inverted ink reservoir to said supporting member, a pen carried by said supporting member, means for supplying

5 ink to said pen point from said reservoir, means for mounting said supporting member for free oscillatory movement over a writing surface engageable by said pen point comprising a plurality of ball bearings, a plate for mounting said ball bearings, a disc-like member engageable with said ball bearings, cam faces connected with said supporting member, coacting cam faces on said disc-like member, and means for angularly shifting 10 said disc-like member with respect to said support whereby said cam faces coact to interpose variable friction on said ball bearings.

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