May 6, 1958 F. F. BOYLE 2,833,251

WRITING INSTRUMENT

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FIG. 1.

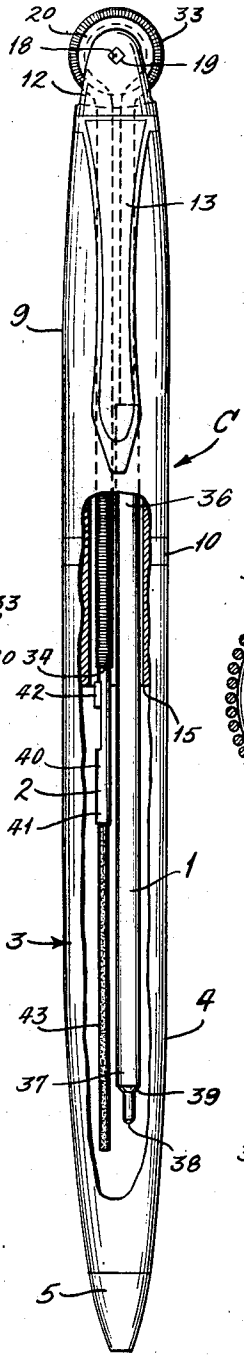


FIG. 2.

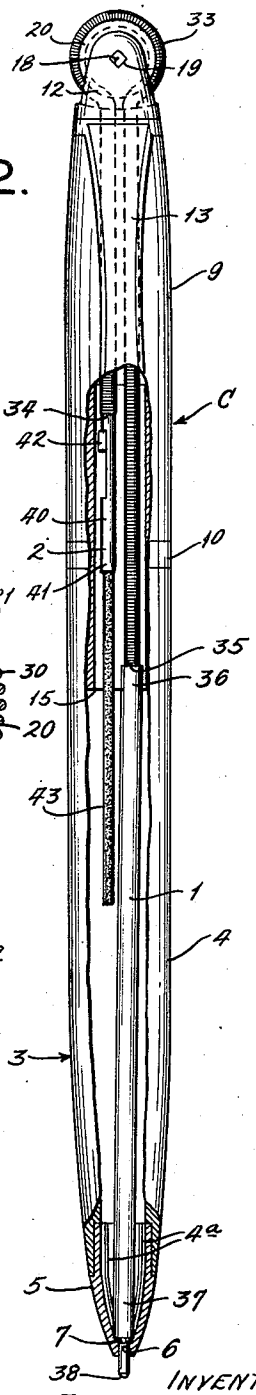


FIG. 3.

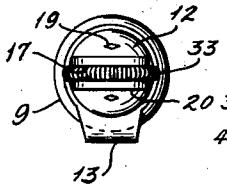


FIG. 6.

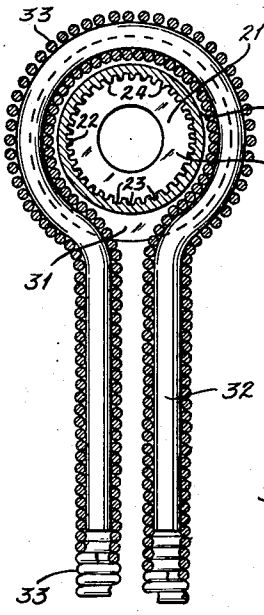


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FIG. 4.

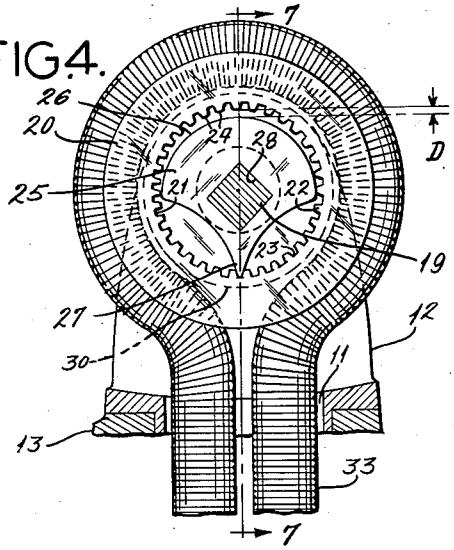



FIG. 5.

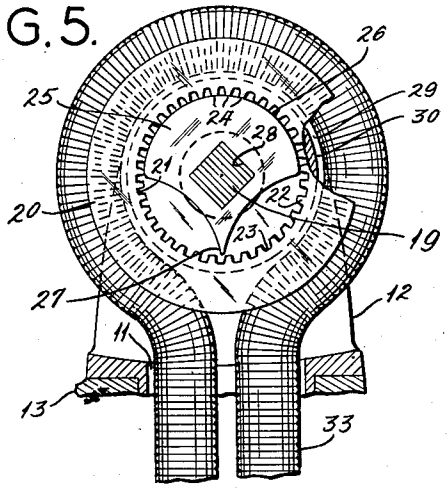



FIG. 8.

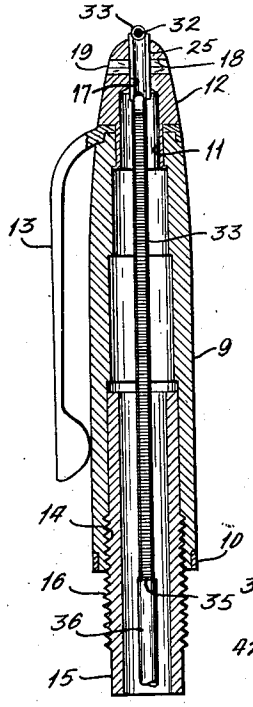



FIG. 9.

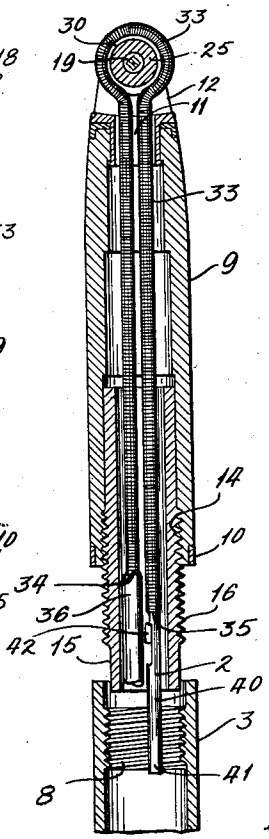
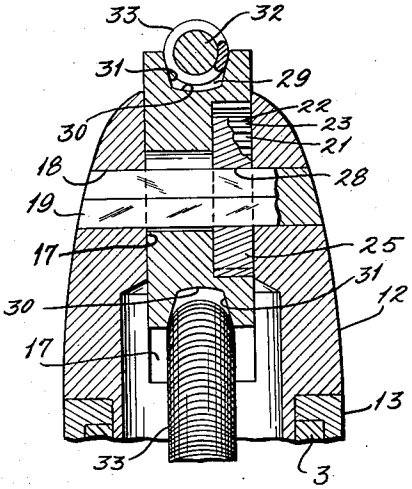



FIG. 7.

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United States Patent Office

2,833,251

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2,833,251

# WRITING INSTRUMENT

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Application January 28, 1955, Serial No. 484,653

6 Claims. (Cl. 120—14.5)

This invention relates to a capless writing instrument having a plurality of writing units therein which can be projected from one end of the casing.

One of the principal objects of the present invention is to provide a writing instrument having a plurality of writing units therein which can be easily projected and retracted through an opening in one end of the casing. These writing units may be of different types and/or of different colors. This writing instrument takes the place of a pencil and a pen.

Another object is to provide means for projecting and retracting a plurality of writing units which can be operated with one hand and which requires no levers for operation. Another object is to provide a multiple writing unit construction wherein the projection and retraction means is outside of the upper unit of the casing. Another object is to provide an easily disassembled casing for replacing or exchanging the writing units.

Still another object is to provide a wheel for projecting and retracting a writing unit with means associated therewith for automatically locking the writing unit in writing position.

These and other objects and advantages will become apparent hereinafter.

This invention is embodied in a writing instrument having a casing with movable writing units therein secured to propelling means for propelling and retracting said writing units, and means for automatically locking the propelled unit in writing position.

The invention also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed. In the accompanying drawings which form part of this specification and wherein like numerals and letters refer to like parts wherever they occur:

Fig. 1 is a longitudinal cross sectional view of a writing instrument embodying the present invention and showing both writing units in retracted position, one of said writing units being a ball pen and the other a pencil,

Fig. 2 is a longitudinal cross sectional view showing one of the writing units in writing position,

Fig. 3 is an enlarged top view of the upper portion of the writing instrument showing the top of the wheel,

Fig. 4 is an enlarged fragmentary cross sectional view showing the clutch engaged with the wheel during writing,

Fig. 5 is an enlarged fragmentary cross sectional view of the wheel and clutch when the wheel is rotating thereby projecting one writing unit and retracting the other,

Fig. 6 is an enlarged fragmentary view of the propelling spring with the horseshoe spring therein mounted on the wheel,

Fig. 7 is an enlarged fragmentary cross sectional view taken along the line 7—7 of Fig. 4 showing the propelling spring out of contact with the bottom of the groove in the wheel,

Fig. 8 is a fragmentary cross-sectional view of the upper portion of the writing instrument showing the end of the wheel, and

Fig. 9 is a fragmentary cross sectional view of the upper portion of the writing instrument showing the side of the wheel.



Referring now to the drawings in detail it will be seen that the embodiment of the invention which has been illustrated comprises a plurality of writing units 1 and 2 movably mounted in the casing C.

The writing instrument includes a lower portion 3 or a hollow plastic barrel 4 having a lower metal band 5 having an opening 6 therein through which said writing units 1 and 2 may project one at a time, and a seat 7 for stopping a ball pen unit in its proper writing position. The lower inside portion of the plastic barrel 4 is provided with six short vertical guide ribs 4*a*. The upper portion of the barrel 4 is provided with internal threads 8. The upper portion or plastic cap 9 of said casing C is hollow and is provided with a metal band 10 circumscribing the lower portion thereof and an opening 11 in the top thereof adapted to receive a bifurcated saddle 12 which holds a metal pocket clip 13 in place. The lower portion of the cap 9 is provided with internal threads 14 which are adapted to receive a threaded bushing 15 having threads 16 thereon which cooperate with the internal threads 8 in the barrel 4.

The saddle 12 is provided with a vertical slot 17 and a hole 18 perpendicular to said slot 17. A square pin or shaft 19 is fixedly mounted in said hole 18. A wheel or pulley-like member 20 is rotatably mounted on said pin 19 and contains a recess 21 with hardened inwardly projecting circumferential teeth 22 with notches 23 therebetween, said teeth 22 having inner bearing surfaces 24 thereon. The recess 21 is adapted to receive a flat sided detent-element 25 having a circular upper bearing portion 26, a downwardly extending projection or tip 27, and a square hole 28 for receiving said square pin 19. The detent-element 25 and pin 19 do not rotate, and one of the flat sides of said detent-element 25 bears against the flat bottom of the recess 21 in the wheel 20. The outer edge of the wheel 20 is provided with a circumferential groove 29 having a bottom 30 and angularly positioned side walls 31.

A horseshoe snap spring 32 is positioned in said groove 29 and is completely enclosed within a spiral propelling spring 33 having two end portions 34 and 35 which extend downwardly into said casing C and which are adapted to receive the writing units 1 and 2. As shown in the drawings, one writing unit might be a ball pen 1 having an upper hollow portion 36 for receiving one end of said propelling spring 33 and a lower portion 37 having a ball tip 38. The lower end is provided with a shoulder 39 adapted to abut against the seat 7 in the barrel 4 to properly position the ball point 38 in writing position. The other writing unit 2 is secured to the other end of said propelling spring 33 and comprises a hollow lead holding member 40 having a sliding releasing mechanism 41 with a lug 42 thereon adapted to be slid forwardly for removing the lead 43 from the lead holder 40. The lead 43 may be propelled or projected from the casing C any desired length for writing. The nature of the writing units can be varied. For example, two different colored ball pen units might be used, or two different colored lead writing units might be used, or a lead writing unit of any color might be used with a ball pen writing unit of any color.

As best shown in Fig. 7 the propelling spring 33 is of such a diameter that it does not touch the bottom 30 of the groove 29 in the wheel 20, but only the angularly positioned side walls 31 thereof. These side walls 31 can be knurled if desired, but such is not necessary. If the pro-

pelling spring **33** touches the bottom **30** of the groove **29** in the wheel **20**, there is a tendency for the propelling spring **33** to slip with respect to the wheel **20**. The present construction allows the propelling spring **33** to positively rotate the wheel **20** without any slippage therebetween.

The operation of the writing instrument will now be described. The writing instrument is normally carried in the pocket of the user with the writing units **1** and **2** both in the retracted position as shown in Fig. 1. In order to project one of the two writing units **1** and **2**, the user rotates the wheel **20** by grasping the propelling spring **33** therein with the thumb and forefinger, or simply by running his thumb downwardly along one edge of said wheel **20** and spring **33**. In so doing, the user automatically and unconsciously causes the wheel **20** to move slightly downwardly from the position shown in Fig. 4 a distance D which is barely visible to the eye and barely noticeable to the touch unless the user is specifically looking for said slight movement. In this position, as shown in Fig. 5, the upper bearing portion **26** of the detent-element **25** forms a bearing surface for the bearing surfaces **24** of the internal projections or teeth **22** of the wheel **20** thereby allowing the wheel to be freely rotated in either direction. Such operation is even more apparent when the user rotates the wheel **20** merely by moving his thumb downwardly along one side thereof thereby causing said wheel to move slightly downwardly.

When the writing unit **1** is in the desired projected or writing position, as shown in Fig. 2, the user merely stops rotating the wheel **20** and starts writing. Releasing pressure from the wheel **20** causes the clutch tip **27** to engage a notch **23** in the wheel **20**. If this is not accomplished merely upon termination of the rotation of the wheel **20** due to the inherent action of the parts, then the slightest upward pressure due to writing forces the writing unit **1** and the connected end of the propelling spring **33** upwardly thereby forcing said wheel **20** slightly upwardly so that a notch **23** engages the clutch tip **27** thereby preventing further rotation. Since there is a great number of notches **23** the upward movement of the writing unit **1**, if any at all, is very small and not noticeable to the user.

To retract the projected writing unit **1** the propelling spring is simply rotated either with the thumb alone or the thumb and forefinger. Continued rotation will cause the other writing unit to be projected from the casing.

To replace or substitute writing units, the barrel **9** is simply unscrewed from the threaded bushing **15** and removed thereby exposing both writing units so that one or more can be replaced. The threaded bushing **15** is tightly threaded into the cap **9** so that only the barrel **4** is removed thereby leaving the parts as best shown in Fig. 9.

This invention is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

What I claim is:

1. A writing instrument comprising a tubular casing having a lower end portion with an opening therein, two writing units movably mounted within said casing, a wheel rotatably mounted in the upper portion of said casing, said wheel having a circumferential groove therein, a tubular flexible cable trained around the wheel and extending into said groove, the end of said cable extending downwardly into said casing, one of said writing units being secured to each end of said cable, means operatively associated with said cable for keeping said cable within said groove, an internal recess within said wheel having a plurality of inwardly presented notches therein, and a detent-element mounted within said recess for allowing said wheel to rotate freely thereabout for propelling a writing unit, said detent-element having projection-means for optional engagement in one of said notches for preventing rotation of said wheel when a writing unit is in writing position thereby locking said writing unit in writing position.



2. A writing instrument comprising a tubular casing having a tapered lower end portion with an opening therein, two writing units movably mounted within said casing, a saddle member projecting upwardly from the upper end of the casing, a shaft extending transversely through the saddle member, a wheel rotatably mounted on the shaft for projecting and retracting said writing units, said wheel having a circumferential groove therein, a tubular flexible cable mounted around the wheel with its ends extending downwardly into said casing, one of said writing units being secured to each end of said cable, spring means mounted in said cable for keeping said cable within said groove, a recess within said wheel having a plurality of notches therein, and a non-rotating detent-element mounted within said recess for allowing said wheel to rotate freely thereabout in one position for propelling a writing unit and preventing rotation of said wheel by engaging a notch in said wheel when said wheel assumes its other position when a writing unit is in writing position thereby locking said wheel against rotation and locking said writing unit in writing position.

3. A writing instrument having two writing units therein, said writing instrument comprising a casing having separable upper and lower portions for replacing said writing units, said lower portion having an opening therein, a saddle member mounted on and projecting upwardly from the upper end of the casing, said saddle member having a slot which opens upwardly and laterally on opposite sides of the saddle member, a shaft mounted crosswise in the slot, a wheel rotatably mounted on a shaft within the slot, said wheel having an internal circular recess and an external circumferential groove therein, said groove having a bottom and sloping sides, a tubular coiled spring cable mounted in said groove with its ends extending downwardly into said casing, said cable being free from said bottom in said groove, one of said writing units being secured to each end of said cable, a spring mounted within the portion of said cable which is trained around the wheel for keeping said cable within said groove, a non-rotating detent-element stationarily mounted in the circular recess of locking a writing unit in projected writing position, said detent-element being fixedly mounted on said shaft and having a bearing surface and a tip, said circular recess of the wheel having a plurality of inwardly presented notches, said wheel having a rotatable position for projecting and retracting said writing units wherein said wheel rotates on said bearing surface of said detent element and a nonrotating position for locking a writing unit in writing position wherein the tip engages a notch in said recess.

4. A writing instrument having a casing, a plurality of writing units movably mounted within said casing, a wheel rotatably mounted in the upper portion of said casing and being shiftable radially of its axis of rotation, a flexible cable trained around the wheel and extending at both ends into said casing, said writing units being secured to the ends of said cable, means operatively associated with said cable for keeping said cable positioned on said wheel, and detent means engageable with said wheel for locking same against rotation and keeping said writing units in a projected position during writing, said wheel being adapted, upon shifting radially of its axis of rotation, to move out of engagement with said detent means to permit rotation of said wheel and shifting of said writing units to and from projected position.

5. A writing instrument having a casing, a plurality of writing units movably mounted within said casing, a wheel rotatably mounted in the upper portion of said casing and being shiftable radially of its axis of rotation, a flexible cable trained around the wheel and extending at both ends into said casing, said writing units being secured to the ends of said cable, a spring threaded through the cable in

that portion which is trained around the wheel for keeping said cable positioned on said wheel, and detent means engageable with said wheel for locking same against rotation and keeping said writing units in a projected position during writing, said wheel being adapted, upon shifting radially of its axis of rotation, to move out of engagement with said detent means to permit rotation of said wheel and shifting of said writing units to and from projected position.

6. A writing instrument having a casing, a plurality of writing units movably mounted within said casing, a wheel rotatably mounted in the upper portion of said casing and being shiftable lengthwise of said casing, a flexible cable trained around the wheel and extending at both ends into said casing, said writing units being secured to the ends of said cable, a spring threaded through the cable in that portion which is trained around the wheel for keeping said cable positioned on said wheel, and detent means



engageable with said wheel for locking same against rotation and keeping said writing units in a projected position during writing, said wheel being adapted, upon shifting lengthwise of said casing, to move out of engagement with said detent means to permit rotation of said wheel and shifting of said writing units to and from projected position.

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