Oct. 8, 1929. J. H. FISCHER 1,730,496

DRAFTING INSTRUMENT

Filed Feb. 1, 1927

Fig. 1.

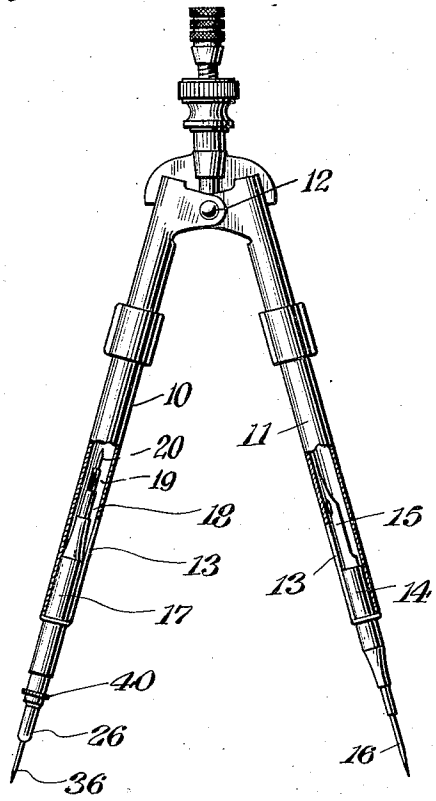


Fig. 2.

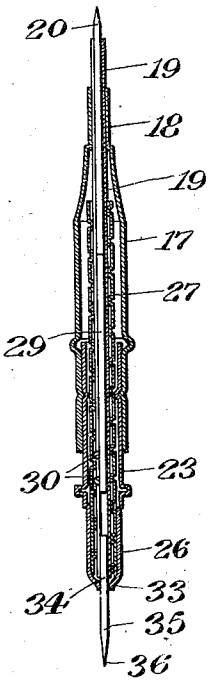


Fig. 3.

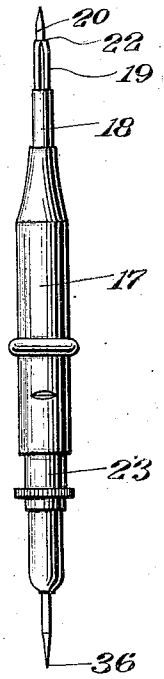
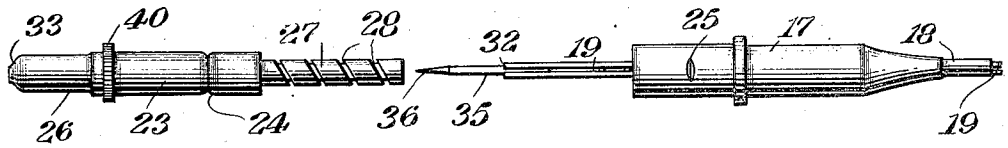


Fig. 4.



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UNITED STATES PATENT OFFICE

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DRAFTING INSTRUMENT

Application filed February 1, 1927. Serial No. 165,061.

This invention relates generally to improvements in drafting instruments, and has particular reference to improvements in what are known as compasses and dividers.

One object of the invention is to provide a novel construction by which a lead may be mechanically fed as the lead is consumed.

Another object of the invention is to provide a construction whereby the lead carrying and feeding mechanism may be reversed in one leg of a pair of compasses to expose for use a pointed pin for engaging the paper or other material when it is desired to use a drawing pen on the other leg of the compasses, in connection with a feature of construction which causes said pin to serve another useful function by causing it to serve as a bearing support for some of the lead feeding mechanism.

Another object is to provide a simple construction whereby two shells for enclosing the lead feeding mechanism may easily be connected in such a way as to limit them normally to a relative rotary movement.

With the foregoing and other objects in view, the invention consists in a novel construction and combination of parts, the novel features of which are pointed out in appended claims, and a preferred embodiment of which is hereinafter described with reference to the drawing accompanying and forming a part of this specification.

In said drawing—

Fig. 1 shows a pair of compasses and dividers of a well known type with the invention applied thereto.

Fig. 2 is a longitudinal section through the detachable device which contains the new features of the construction.

Fig. 3 is an elevation of the device shown in section in Fig. 2.

Fig. 4 shows the detachable device dis-assembled partially to show certain details of the construction.

The device shown in the drawing comprises a pair of legs 10 and 11 pivotally connected at 12 and held in the different angular positions to which they may be adjusted in any desired way. The legs 10 and 11 are formed from material having a certain amount of resiliency and are split or left with the adjacent edges of the metal unattached as at 13 to form a clutch at the lower end of each leg.

One of the legs carries an element 14 provided with a socket or clip to hold an inserted pen 15 and carries a pin 16 for engaging the paper or corresponding drafting material.

The other leg of the compasses carries the lead feeding mechanism and associated parts. These comprise a shell 17 of any suitable material having an end shaped as at 18. Secured within the portion 18 of the shell 17 is a split tube 19 into which lead or other marking material 20 may be inserted. This split tube projects beyond the portion 18 of the shell 17 and at its end 22 is restricted sufficiently to frictionally engage the lead 20.

Cooperating with the shell 17 is a shell 23 having an external diameter sufficient for the shell 23 to have a snug fit within the open end of the shell 17. In order to permit easy assembling and normally limit relative movement of the two shells to a rotary movement the shell 23 is provided with a peripheral groove 24 and the shell 17 with internal short ribs or projections 25 formed by inwardly indenting the material of the shell. In assembling the two shells are telescoped until the ribs 25 snap into the groove 24, movement past the point where the ribs and groove engage being prevented as hereinafter made clear. This construction permits employing the resiliency of the material of the two shells to effect the connection and permits disengaging the two sections of the shell without damage to either if it is desired to gain access to their interiors for any purpose.

Secured within the portion 26 of the shell 23 is what is for convenience referred to herein as the helix. This helix, designated 27 in the drawing is of any suitable material formed as shown at 28 to construct an internal thread lightly contacting the periphery of the split tube 19 when the parts are in assembled relation.

Slidably supported within the split tube is a propeller rod 29 provided with projections 30 extending through the slot in the split tube into engagement with the internal

threads 28 of the helix. It is apparent that relative rotations of the shells 17 and 23 will cause the propeller rod 29 to advance or retract, the direction of movement of the rod depending upon the direction of the relative rotation. The split tube 19 is of such length that in assembling the parts the end 32 of the tube will engage the inner wall of the portion 33 of the shell 23, thereby preventing the ribs 25 riding past the groove 24 when the shells are being fitted together.

The portion 33 of the shell 23 is provided with an axially extending opening 34 and soldered or otherwise fastened to the split tube 19 is a pin 35 which is pointed at its free end as shown at 36. When the parts are in their normal assembled relation the pin 35 extends through the opening 34, the construction being such that the pin is limited to a rotary movement in the opening. It is obvious that this cooperation of the pin and opening provides a bearing support for the unattached end of the split tube 19 and that the tube will in turn afford a bearing and support for the unattached portion of the helix 27. This construction and arrangement of the parts is a desirable one, particularly in a construction where the parts are all small in dimensions and made of material which is not highly resistant to damage. In addition to the advantages in the way of supporting and maintaining the parts in correct relations, the pin 35 is available for use in the usual way either in connection with the pin 16 or the drawing pen 15.

In order to facilitate operation to feed the lead, the shell 23 is provided with a knurled band or bead 40 of sufficient diameter to give a firm frictional engagement with the interior of the clutch portion at the lower end of the leg of the compasses, thereby preventing rotation of the unit as a whole when an attempt is made to feed the lead by turning the shell 17.

In describing the construction of the device it has been necessary incidentally to describe the operation of the parts singly and as a whole and it is thought no re-statement of operation is necessary.

While the embodiment shown and described is admirably adapted to fulfill the purposes primarily stated, it is not the desire to be limited to details except as they are included in the following claims.

What is claimed is:

1. In a device of the character described, a pair of shells connected for relative rotation and provided with axial openings in their non-adjacent ends, a lead feeding mechanism within the shells constructed to feed lead in one of said openings by relative rotations of the shells, said mechanism comprising a split tube secured within one of said shells, and a pin integral with the split tube and projecting through the other of said openings.

2. In a device of the character described, the combination of a pair of shells connected for relative rotation and provided with axial openings at their non-adjacent ends, lead feeding mechanism for feeding lead through one of said openings comprising a split tube secured within one of said shells and a helix surrounding the split tube and secured within the other of said shells, and a pin rigid with the split tube and extending through the other of said openings to form a bearing support for the split tube and having the exposed end of the pin pointed.

3. In a device of the character described, a pair of shells, one of which has a sliding fit within the other, there being a peripheral groove in the inner shell, and a plurality of short internally projecting ribs carried by the outer shell and engaging in the aforesaid peripheral groove.

4. In a device of the character described, a lead feeding mechanism, a casing for the lead feeding mechanism comprising a pair of shells, one of which has a rotating fit within the other, there being a peripheral groove in one of the shells, and a plurality of short ribs on the other shell engaging said groove, said ribs and groove cooperating normally to limit the shells to a rotary relative movement.

5. A reversible plug for use in a leg of a pair of compasses comprising two shells connected for relative rotation, lead feeding mechanism within said shells and connected for operation by relative rotation of the shells to feed lead through an opening in the end of one of the shells, and a pin projecting outward from the end of the other shell.

In testimony whereof I hereto affix my signature.

JOHN HENRY FISCHER.