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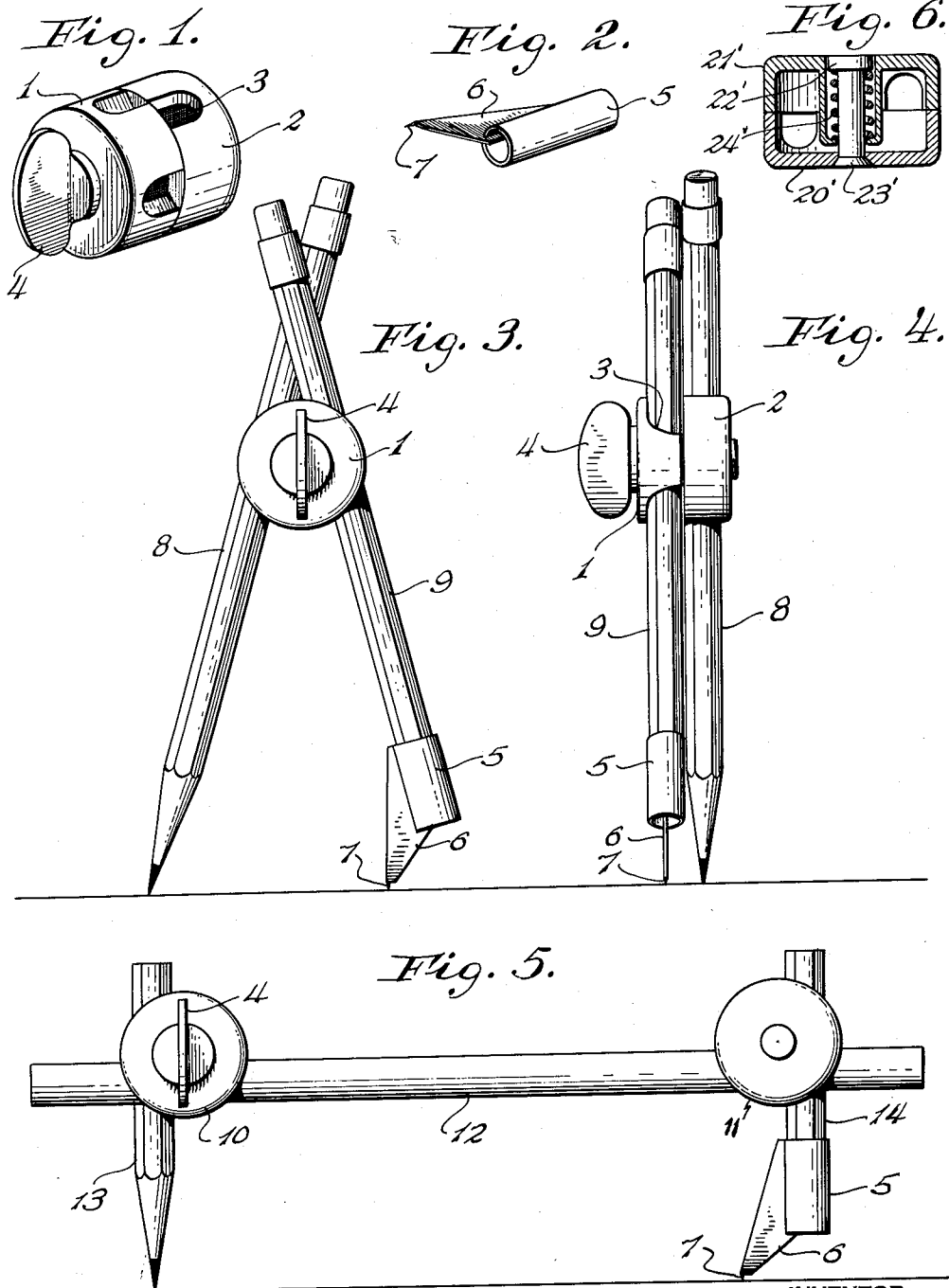
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2,745,181

DRAFTING COMPASS

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Fig. 7.

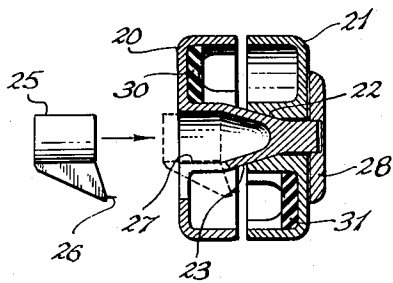


Fig. 8.

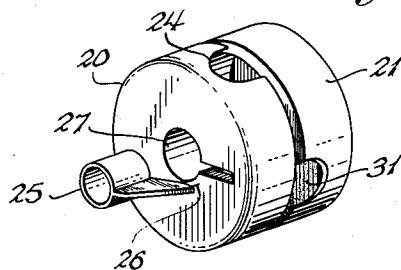
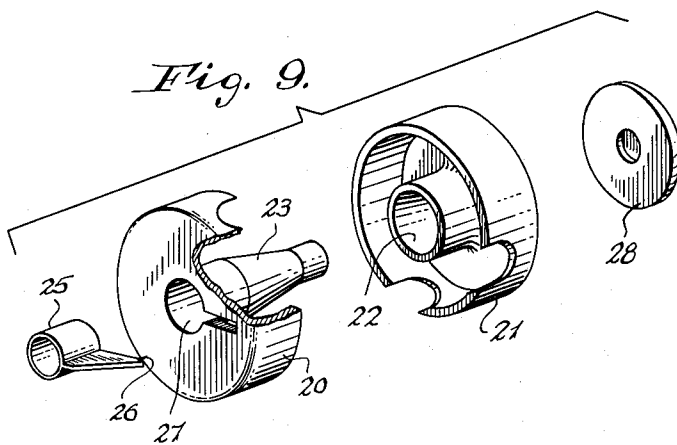


Fig. 9.



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DRAFTING COMPASS

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3 Claims. (Cl. 33—27)

This invention relates to compasses for the drawing or drafting of circles.

There is a need for inexpensive, accurate, lightweight and compact drawing or drafting compasses. The present day inexpensive instruments for use in elementary and intermediate drawing work are inaccurate and usually have a short life span. Due to the construction of these instruments with their long thin metal legs, and the fact that they cannot be disassembled renders them prone to be bent and sprung out of alignment. Furthermore, the flexing of the legs through bending tends to loosen the pivot holding them together and makes it difficult to keep the two legs at the proper relationship to each other throughout the complete operation of drafting a circle. It is particularly note-worthy that these compasses, at best, are inadequate for use in making or drawing very small circles. The work requirements of this particular use, however, would not seem to warrant the expense of an existing instrument of the necessary design and construction to provide longer life or greater accuracy.

A construction of the present inexpensive compasses makes them somewhat dangerous when used and handled by children. The long sharp pivotal leg which cannot be disassembled makes the instrument difficult to carry without danger to the carrier and to others. Said compasses are seldom sold with their own protective carrying cases.

The present invention is designed to provide a compass of several parts that can be easily assembled or disassembled. It comprises, generally, an adjustable clamp adapted to clamp two pencils together. When clamped together, the pencils form the legs of the compass, thus adding strength and stability to the instrument. A separate point assembly is provided to be attached to the pivotal pencil leg of the instrument when in use, and carried separately for safety when not in use. The clamp comprises a pair of slotted discs which are cut to receive the pencils and a means to adjustably clamp the discs together.

Accordingly, a principal object of the invention is to provide a new and improved drafting compass means.

Another object of the invention is to provide a compass means that is not easily bent or sprung out of alignment when or when not in use.

Another object of the invention is to provide a compass means wherein its legs are securely held in proper relationship to each other throughout drawing or construction of a circle.

Still another object of the invention is to provide a compass means that is not expensive, yet accurate for the drawing of very small circles.

Another object of the invention is to provide a compass means that can be safely carried and handled by children.

A further object of the invention is to provide a compass means that is strong and stable when assembled.

Another object of the invention is to provide a compass means that can be readily disassembled for ease and safety of carrying.

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A still further object of the invention is to provide a compass means utilizing light-weight materials, such as aluminum or plastic.

These and other objects will be apparent from the following specification and drawing of which:

Figure 1 is an isometric view of an embodiment of a clamp for use in the invention.

Figure 2 is an isometric view of a point assembly for use in the invention.

Figures 3 and 4 are views of embodiments of the invention.

Figures 5 and 6 are views of other embodiments of the invention.

Figure 7 is a section view and Figures 8 and 9 are isometric views of still another embodiment of the invention.

Figure 1 shows a clamp means of the invention. Discs 1 and 2 are similar in construction and are each substantially hollow cylinders with one base end of each being open. Located in the side wall of each disc is a pair of slots or grooves 3. The slots or grooves of each disc are located less than 180° apart on the circumference of the disc and extend from near the closed base end of the disc to end of the side wall at the open base end. The slots or grooves are of a depth less than the diameter of a conventional sized pencil.

The disc members are adapted to be clamped together by thumb screw 4, the screw extending through both discs, one of which is tapped to receive the threads.

Figure 2 shows the separate point assembly. A sleeve member 5 is provided to slide over the diameter of a pencil. Flange 6 is radially attached to sleeve 5 and may extend inside the wall of the sleeve in a tapering fashion to cut into a pencil and hold it securely. Flange 6 terminates in a sharp point 7, thus forming the pivot point of an assembled compass.

Figures 3 and 4 show the invention in its assembled state by the utilization of pencils 8 and 9 to form the legs of the compass.

In operation, pencils 8 and 9 are inserted in the disc members. In each disc, the respective pencil enters through one of the slots of the pair of slots and emerges through the other. The orientation of the pencils is such as to provide that the end of the pencil 9, designed to receive the separate point assembly, is adjacent to the sharpened point of pencil 8.

The design of the separate point assembly is such as to permit the point 7 to lie immediately adjacent a sharpened point of the pencil 8. When the pencils are inserted in the discs and adjusted to the same length, the discs are rotated with respect to each other providing the desired radius of a circle to be drawn.

The discs are drawn together by tightening the thumb screw. This action causes the edge of the side wall at the open base end of each disc to bear against the pencil located in the grooves of the opposite disc. The pencils are prevented from moving with respect to each other by being held securely between the bottoms of the grooves and the edges of the side walls of the discs. In the disassembled state, the various components of the invention can be carried loose and there are no parts that are subject to be easily bent or distorted.

Figure 5 shows another embodiment of the invention for use as a bar or beam compass for the drawing of larger circles. It comprises two clamping means, 10 and 11, as above described, a bar member 12, which may be another pencil, and two leg members 13 and 14, also pencils. One of said leg members being provided with a separate point assembly 5, 6 and 7, as before.

The operation and use of this embodiment is similar to that previously explained.

Figure 6 shows another embodiment of the clamping

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means. This embodiment is designed to eliminate the thumb screw. It comprises primarily two slotted hollow cylinders or discs 20' and 21', similar to those of the embodiments previously described. These members are held tightly together at their open base ends by the rod 23' and spring 24', which are located along the then common axis of the members. The rod 23' is fastened to member 20' at its otherwise closed base end and it is provided with a head portion 22' which compresses the spring 24'.

The pencils are inserted in the disc members and adjusted with respect to each other by pulling the discs apart slightly against the spring to receive the pencils and allow rotation with respect to each other, other features of the embodiment and its use being similar to that previously discussed.

Figures 7, 8 and 9 show another embodiment of the invention which eliminates the thumb screw and spring and provides an even similar and more compact unit.

Figure 7 is a cross-sectional view of the embodiment showing the relative location of the various parts in their assembled positions.

Figure 8 is an isometric view of the embodiment as assembled.

Figure 9 is a group of exploded isometric views of the embodiment.

This embodiment comprises two essentially hollow cylinders or disc members 20 and 21, each open at one of their base ends. Both of said members are provided with slots or grooves located in the side walls as in the other embodiments.

Located within the hollow portion of hollow cylindrical member 20, concentric therewith and joined to said member at its closed base end is a second member 23 which is first cylindrical in form, then conical, then finally again cylindrical starting from its end at the junction with said hollow cylindrical member.

The first of said cylindrical portions of said member 23 is greater in diameter than that of the second said cylindrical portions, and the respective diameter of each of said cylindrical portions, being, in turn, equal to the diameter of the conical portion connecting them at the respective places of connection.

Located within the hollow portion of hollow cylindrical member 21 concentric therewith, and adjoined to said member at its closed base end is a second cylindrical member 22. Said second cylindrical member is provided with a tapered bore along the common axis of the two cylindrical members. Said tapered bore extends completely through said second cylindrical member and the otherwise closed base end of said hollow cylindrical member, with the smallest diameter of said bore at the otherwise closed base end of the said hollow cylindrical member.

Hollow cylindrical member 20 is further provided with a bore 27 and adjacent slot. Said bore commences at the otherwise closed base end of said hollow cylindrical member and extends along its axis into said second member 23 therein concentrically located. Said bore is first constant in diameter and then tapers so as to conform in shape with the respective first cylindrical and conical portions of said second member. The slot is radially located in the closed base end of said hollow cylindrical member and extends into said bore so as to form a key-shaped cutout on the otherwise closed base end of said hollow cylindrical member.

This embodiment contains a separate point assembly similar to that of the other embodiments comprised of a sleeve member 25 and a radially attached flange member terminating at point 26. The intent in member 20 is to accommodate the point assembly 25, 26 for safe and convenient storage when not in use.

Disc shaped button 28 is provided with a circular recess at its center adapted to receive the second cylindrical portion of the member 23 and to provide a tight and secure fit between the two said members. An accepted procedure

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would be to form a permanent bond between said members after assembly of the clamping device.

Located on the inside surface of the closed base end of both members 20 and 21, under and between the pair of slots therein located are elastic composition pads 30 and 31 which are of a size or thickness to extend beyond the bottom of said slots.

The assembly of this embodiment requires the insertion of the member 23 located within member 20 through the tapered bore of member 21. The design is such as to provide that in the fully inserted position member 23 extends beyond the closed base end of member 21 to receive button 28.

In operation, pencils are inserted in the slots as before and adjusted with respect to each other. The members 20 and 21 are pressed together creating a tight and locking condition between said members as the conical surface of the member 23 makes contact with the surface of the tapered bore. The same action causes contact between the edge of the wall of each disc member and the pencil located in the slots of the other member. In the locked position, the elastic composition pads are depressed, providing that the pencils are securely held in their predetermined relationship to each other.

In this locked or engaged position, there is a space between the button 28 and the member 21. Disengagement is accomplished by holding member 21 while pressing button 28 toward said member. This action pushes the conical section of the member 23 back and breaks the contact between its surface and that of the tapered bore of member 21.

When not in use, a separate point assembly is conveniently stored in the bore and slot of member 20, where the bore is adapted to accept the sleeve, and the slot to accept the radial flange, in a manner that provides a friction fit.

While the discussion herein has been limited to the use of pencils in the clamping device to form the legs of the compass means and the connecting bar of the beam compass, it has been done for convenience of description only and is not intended as a limitation of the invention. It is obvious to those skilled in the art that the respective legs of the compass means and the bar of the beam compass may be made of any rigid material adapted to receive a writing means including a pen and the compass point means described.

I claim:

1. Compass means comprising a first cylindrical member having a base and a circular wall, a first axial projecting member affixed to said base, said axial projecting member having a first constant diameter portion adjacent said base, a decreasing diameter portion adjacent said first constant diameter portion and a second constant diameter portion at the termination of said projecting member, a second cylindrical member having a base and a cylindrical wall, a second axial projecting member affixed to the base of said second cylindrical member, said second axial projecting member having an axial directed hole therethrough, said hole having a constant diameter portion adjacent the base and an increasing diameter portion adjacent said constant diameter portion and a circular button member having a circular recess in one face thereof, said recess having the same diameter as said second constant diameter portion of said first axial projecting member.

2. Apparatus as in claim 1 wherein the base of said first cylindrical member has an indentation therein and compass point means adapted to be inserted in said indentation.

3. Apparatus as in claim 1 wherein the circular wall of said first cylindrical member has a pair of circular cut outs at its terminal edge and the circular wall of said second cylindrical member has a pair of circular cut outs at its terminal edge.

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