(No Model.)

# H. A. KLEIST.

## DRAWING INSTRUMENT.

No. 533,819. Patented Feb. 5, 1895.

Fig 1

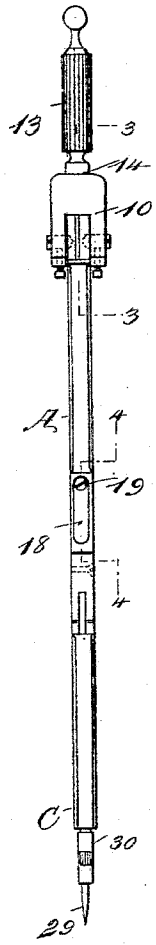



Fig 3

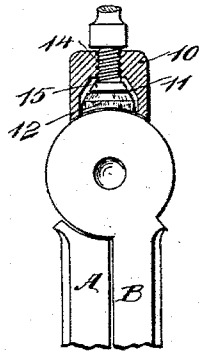



Fig 2

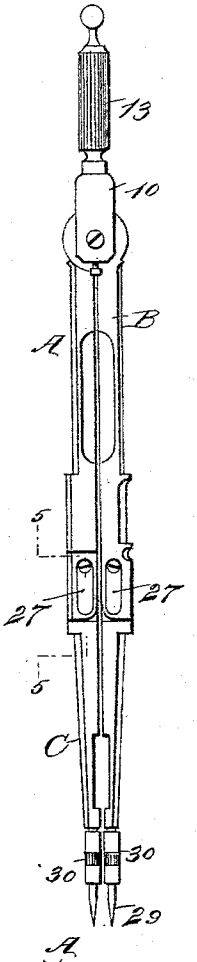



Fig 4

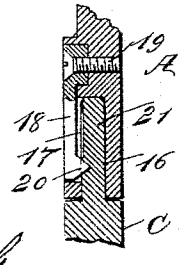
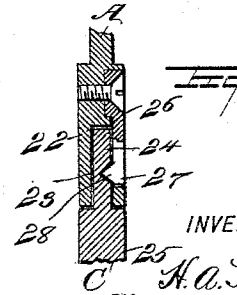



Fig 5

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# UNITED STATES PATENT OFFICE.

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## DRAWING-INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 533,819, dated February 5, 1895.

Application filed April 13, 1894. Serial No. 507,425. (No model.)

*To all whom it may concern:*

Be it known that I, HERRMAN A. KLEIST, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Drawing-Instrument, of which the following is a full, clear, and exact description.

My invention relates to an improvement in drawing instruments of the compass type, and it has for its object to provide a means whereby all set screws may be dispensed with, and whereby the slip joint in such an instrument may be expeditiously and firmly effected, without the fastening device forming any obstruction upon the outer face of the instrument or projecting therefrom in any manner.

A further object of the invention is to provide a pivot joint for such an instrument in which a set screw will not be required, the exterior surface of the instrument at such joint being practically smooth, and the joint being so constructed that as it wears the pivot pin will automatically take up such wear.

Another feature of the invention consists in so constructing the bail handle of a compass drawing instrument that in a convenient and expeditious manner the legs of the instrument may be held in any position in which they may have been placed, thus preventing their wabbling in making a circle or an arc thereof, and enabling the instrument to be handled with more precision than heretofore.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is an edge view of the drawing instrument. Fig. 2 is a side elevation thereof. Fig. 3 is a section taken essentially on the line 3—3 of Fig. 1, illustrating the brake attachment for the handle of the instrument. Fig. 4 is a section taken essentially on the line 4—4 of Fig. 1, illustrating the manner in which the slip joint is made; and Fig. 5 is a section taken essentially on the line 5—5 of Fig. 2, illustrating the manner in which the pivot joint is created.

The instrument consists, as is usual, of two legs A and B, which are pivotally connected at their upper ends, as shown in Fig. 3, usually by a rule joint; and at this point the instrument is provided with a bail 10, which extends over the pivot or head portion of the instrument. This bail is adapted to move in the usual manner over the circular surface of the head, but it is provided in its body portion with a concavity or chamber 11, as shown in Fig. 3. A brake block 12, is located within said chamber, adapted to act in the capacity of a shoe, the under face of which shoe or block is curved correspondingly to the curvature of the head, whereby when the bail is moved from side to side the shoe will readily slip over the head.

The handle 13 of the instrument is provided with a threaded shank 14, which is made to extend downward through a correspondingly treated aperture in the body portion of the bail 10, as is likewise shown in Fig. 3, the shank being made to extend within the bail chamber 11, and its lower end is upset to form a head 15. It is evident, therefore, that when the legs of the instrument have been placed in a predetermined position, by turning the handle 13 in a manner to cause the head of this shank to press downwardly upon the brake shoe 12, the shoe will be held in such frictional engagement with the head as to prevent the legs from moving from the position in which they were placed. This brake operation may be effected by giving the handle 13 but a slight turn, a half or a quarter turn for example. In this manner the instrument may be much more accurately and conveniently handled than heretofore, in making a circle or in producing curved lines.

With reference to the slip joint shown in Figs. 1 and 4, the leg in which the slip joint is to be made is provided with a longitudinal recess 16 in its lower end, which recess may be circular or polygonal, as desired. Usually, however, the said recess is made circular with the exception of its outer wall which is preferably made flat, and a second recess 17 is produced usually in the outer edge of

the leg, extending through the flat wall of the inner recess or chamber 16, and the said recess 17 is usually closed by a spring tongue 18, one end of which is countersunk in the leg and is secured by means of a screw 19 or its equivalent. Normally the outer face of the spring 18 is flush or practically so with the outer surface of the leg, as is clearly shown in both views, Figs. 1 and 4. This spring tongue at its free end is provided with a conical spur 20, formed upon its inner face, and the section C of the instrument to be added to the compass leg is provided with a shank 21, its cross sectional shape corresponding to that of the recess or chamber 16 in the leg; and the shank 21 of the added section is provided with a cavity shaped and adapted to receive the conical spur 20 of the spring tongue. Thus in effecting a slip joint the shank of the added section is simply pressed into the chamber 16 of the compass section, and when the two parts shall have reached a proper position the spur of the spring tongue will have entered the recess in the shank 21, and the two sections will be securely locked. The sections are separated by simply drawing one from the other.

With reference to the construction of the pivot joint, such construction is shown in Figs. 2 and 5, in which one member, of the leg section C the upper member for example, 22, is provided with the usual slot 23 to receive the flat shank 24 of the lower member 25 of the leg section C of the instrument. Instead, however, of providing a pivot pin, or a set screw as is usual to effect the pivot connection between these two members, the upper member 22 is provided with a recess 26, formed usually upon one side surface and leading into the slot 23 receiving the shank of the lower member. This recess 26, is normally closed by a spring tongue 27, secured at one of its ends to the upper member 22, and the said spring tongue is provided with a spur 28 of conical formation, which enters a corresponding recess made in the shank of the lower member. Thus it will be observed that as the joint wears through the frequent movement of one of its parts or members, the spur 28 will gradually deepen the socket into which it enters, and owing to the conical formation of the said spur will force the shank of the lower member in an upwardly direction, thus always insuring a tight fit between the shoulder of the lower member and the abutting end of the upper one.

The lower members, or attached members of the instrument adapted to carry points or pencils 29, are fitted with barrel clamps 30 to receive said points or pencils, thus obviating throughout the construction of the entire instrument the use of set screws or any projection upon either the front or rear sides or edges of the instrument.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A drawing instrument comprising the hinged body members having socketed lower ends provided with lateral elongated openings, spring tongues closing said openings and each having a spur on its inner side extending into said sockets, and the leg sections C each formed of two members hinged together, the upper members being each provided with a spring tongue having a spur which forms the axis of the lower member, and the upper members of the leg sections C being provided with a shank having a recess in one side to engage the spur projecting into the sockets of said body members.

2. The leg section C formed of the lower or main member 25 having a flat shank 24 provided with a recess in one side, and the upper member 22 having a forked lower end 23 receiving the shank 24 and provided with a shank 21 on its upper end, a slot 26 being formed in one wall of said fork, and a spring tongue 27 closing said slot and having a pivot-forming spur 28 entering the recess in said flat shank 24, substantially as described.

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