

[54] DRAWING HEAD FOR USE IN DRAWING DEVICES

754,445 8/1956 Great Britain33/79 R

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[57] ABSTRACT

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A drawing head for use in drawing devices in which two flat members are mounted on a common axle and fixed relative to each other by means of spherical bodies disposed therebetween. The first flat member is associated with a means for moving the drawing head in the plane of the drafting board, and the second member with drawing scales through the intermediary of a square. The square is loosely mounted on the axle and is fixed relative to the second flat member by means of a friction clamp.

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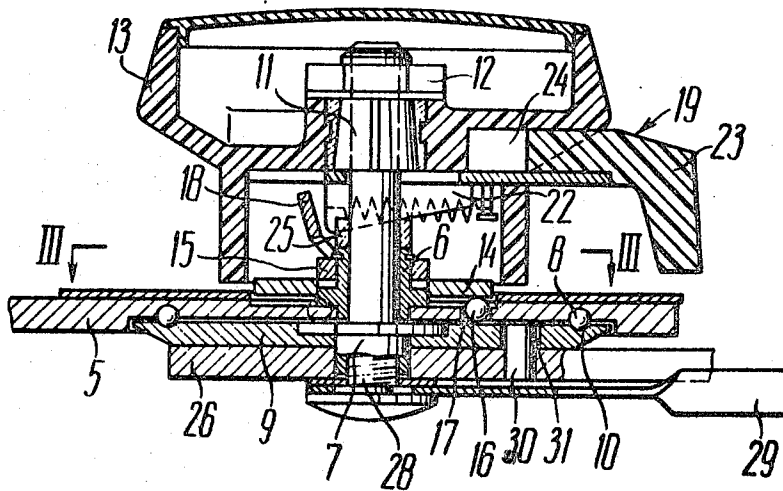
[58] Field of Search.....33/79

[56] References Cited

3 Claims, 4 Drawing Figures

FOREIGN PATENTS OR APPLICATIONS

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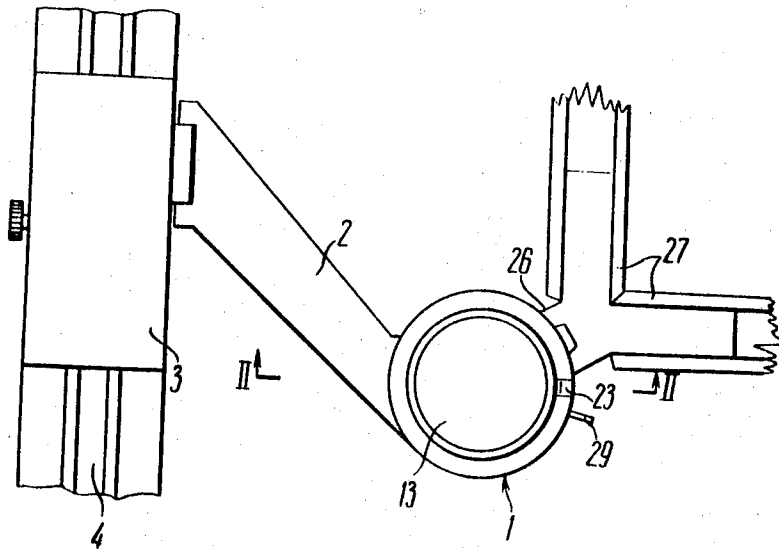


FIG. 1

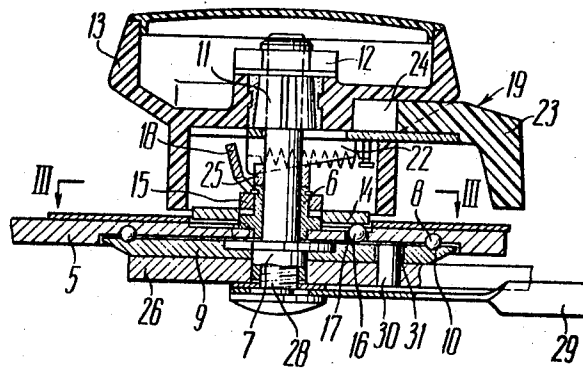


FIG. 2

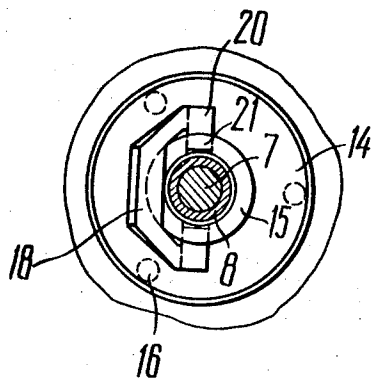


FIG. 3

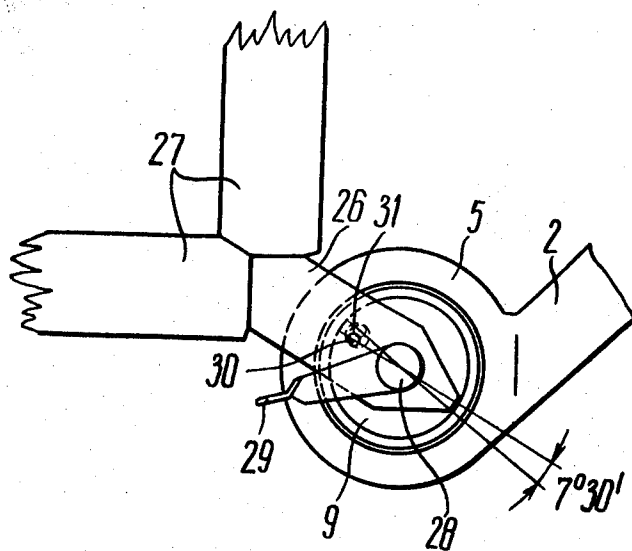


FIG. 4

DRAWING HEAD FOR USE IN DRAWING DEVICES**BACKGROUND OF THE INVENTION**

The present invention relates to drawing devices, and more particularly to drawing heads.

Known in the art are drawing heads for use in drawing devices, comprising two flat members of which one member is associated with a means moving the head in the plane of the drawing board and the other member is rigidly connected with a square carrying scales. Both members are mounted on an axle mounting and means is used for turning one of the members relative to the other member.

One of the members is fixed relative to the other member by means of spherical bodies disposed therebetween. The position of the square with the drawing scales is fixed on the drawing head at angles divisible by the pitch of a dividing disc which, in the drawing head under description, is essentially the second flat member.

In the above-described drawing head, the position of the square with the drawing scales cannot be fixed by means of spherical bodies at angles that are not divisible by the pitch of the dividing disc, thereby limiting the operating possibilities of this drawing head.

It is an object of the present invention to eliminate the above-mentioned disadvantage.

SUMMARY OF THE INVENTION

The main object of the present invention is to provide a drawing head for use in drawing devices, in which the square is associated with the second flat member in such a manner that any angular position thereof relative to the first flat member is always fixed in spherical bodies.

This object is accomplished by that in a drawing head for use in drawing devices, in which the first flat member associated with a means for moving the head in the plane of the drafting board and the second flat member associated with the drawing scales through the intermediary of a square are mounted on an axle and are fixed relative to each other by means of spherical bodies disposed therebetween, according to the invention, the square connected with the drawing scales is loosely mounted on the axle and is fixed relative to the second flat member by means of a friction clamp.

It is expedient to make the friction clamp as a screw with a lever mounted in a threaded hole provided in the butt end of the axle. This embodiment of the friction clamp is simple in design and convenient in use.

It is no less expedient to secure a stop on the square connected with the drawing scales, and to provide the second flat member with a hole for accommodating the stop and limiting the turn of the square relative to the second flat member from a position divisible by 5° into a position divisible by $2^\circ 30'$.

The provision of the stop on the square and the hole in the second flat member makes it possible to dispose the square with the drawing scales relative to the second flat member in the initial position divisible by 5° and a position divisible by $2^\circ 30'$ quickly and always with a constant high accuracy.

The present drawing head allows the square connected with the drawing scales to be fixed at any predetermined angle by means of spherical bodies, thus resulting in a more accurate operation of the device.

Other objects and advantages will become apparent from the following description of an exemplary embodiment of the present invention, given with reference to the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of the drawing head;

FIG. 2 is a section taken along line II—II of FIG. 1 the view looking in the direction of the arrows and being on an enlarged view;

FIG. 3 is a section taken along line III—III of FIG. 2, the view looking in the direction of the arrow; and

FIG. 4 is a rear view of the drawing head.

DETAILED DESCRIPTION OF THE INVENTION

A drawing head 1 (FIG. 1) is mounted on a bracket 2 connected with a device 3 for moving the head 1 in the plane of the drafting board (not shown in the drawing), and such device in this particular case in a carriage moving along a guide 4.

The bracket 2 is integral with a first flat member 5 (FIG. 2). The flat member has a hole provided with a bushing 6 therein and rigidly connected therewith and an axle 7 passes through the bushing. As a predetermined radius from the axle 7, spherical bodies 8, such as balls are disposed in the first flat member 5. Securely fixed on the axle 7 is a second flat member 9 which is essentially a dividing disc of the drawing head 1. The surface of the disc 9 is provided with an annular shaped groove formed by a continuous row of recesses 10 disposed with respect to the center of the axle 7 at the same radius as the balls 8 of the first flat member. The angle between two adjacent recesses 10 is divisible by 5° .

A casing 13 is secured in the upper portion of the axle 7 by means of a chuck 11 provided with a nut 12, with the casing accommodating a means used for turning the second flat member 9 relative to the first flat member. Such turning means comprises two washers 14, 15 disposed on the bushing 6 with one washer being located above the other washer. The washer 14 is loosely fitted onto the bushing 6 and rest upon pushers 16 such as balls 17 lodged in holes in the first flat member 5.

The washer 15 is mounted stationarily in the axial direction, and positioned between the washers 14 and 15 is a lever 18 acting upon the washer 14 in the course of its interaction with a spring-loaded clamp 19. The lever 18 is fashioned as a clamp whose ends 20 (FIG. 3) are disposed in slots 21 in the washer 15.

The spring-loaded clamp 19 is essentially a wedge 22 (FIG. 2) which is movable in the transverse direction relative to the axle 7. The wedge is rigidly connected with a button 23 protruding from the side of the casing 13 to the exterior thereof. A slot 24 is provided to permit the button 23 to pass into the casing 13.

The wedge 22 is spring-loaded and rests upon an insert 25. Loosely mounted on the end portion of the axle 7 is a square 26 connected with drawing scales 27 (FIGS. 1, 4). The position of the square 26 relative to the second flat member 9 is fixed by means of a friction clamp which is essentially a screw 28 (FIGS. 2, 4) which is threaded into a threaded hole in the butt end of the axle 7. To tighten the screw 28, the screw is provided with a lever 29 whose free end protrudes to the exterior of the first flat member 5.

The friction clamp can be fashioned as a nut provided with a lever, threaded onto a screw at the end of the axle.

The free disposition of the square 26 on the axle 7 makes it possible to turn the square relative to the second flat member 9, which, as above mentioned is essentially a dividing disc, through any angle, including those angles which are not divisible by the pitch of the dividing disc.

To quickly and accurately position the square 26 at angles divisible by the pitch of the dividing disc 9, i.e., in this particular case 5°, and angles divisible by 2°30', the square 26 has a stop 30 rigidly fixed thereon, and the dividing disc 9 has a hole 31 provided therein for accomodating the stop. The stop 30 is capable of displacing in the hole 31 through an angle equal to 7°30'.

The drawing head for use in drawing devices operates as follows:

In its initial position, the square 26 with the drawing scales 27 is oriented with respect to the dividing disc 9 with the aid of the stop 30 which is pressed in the clockwise direction against the wall of the hole 31, with the screw 28 being tightened. The drawing scales are turned through a predetermined angle divisible by the pitch of the dividing disc in the following manner:

By pressing upon the button 23, a gap is formed between the wedge 22 and the insert 25 until the butt end of the wedge 22 interacts with the lever 18. With the wedge 22 acting upon the lever 18, the lever, while turning in the slots 21 of the washer 15, presses on the washer 14 and through the intermediary of the pushers 16 moves aside the dividing disc 9 until the balls 8 completely leave the recesses 10. Upon turning the casing 13 rigidly connected through the intermediary of the axle 7 with the drawing scale 27 through a predetermined angle, for instance, 5° (or through any other angle divisible by 5°), the button 23 is released.

Under the action of the spring, the wedge 22 is retracted and, while resting upon the insert 25, moves the axle 7 relative to the bushing 6 upwardly until the balls 8 completely enter the recesses 10.

The drawing scales are turned through an angle which is not divisible by 5° in the following manner:

The square 26, which is in its initial position, is released by turning the screw 28 by the lever 29, so that it can freely turn on the axle 7 relative to the dividing disc 9.

The square 26 is positioned at an angle of 6° and is fixed in this position by tightening the screw 28. Then, by using the pitch of the dividing disc 9, it possible to turn the square 26 in the above-described way through the angles of 11°, 16°, 21°, etc.

The experience of projecting and designing work have demonstrated that the angles most often used in the work of the designer are, first of all, angles divisible

by 5° (10, 15, 30, 35, etc.), and, then, those divisible by 2°30' (7°30', 12°30', 22°30', etc.). Therefore, the present drawing head for use in drawing devices provides for a rigid positioning of the drawing scales at any angle divisible by 2°30'. This positioning is effected in the following way: the screw 28 is released.

The square 26 turned in a counter-clockwise direction, and the screw 28 tightened again.

Position of the drawing scales on the drawing head will always correspond to an angular value divisible by 2°30'

The scales are transferred from such an angle to another angle, for example, 12°30', 27°30', by also using the pitch of the dividing disc 9 and with the aid of the button 23.

Thus, in the above-described drawing head, the drawing scales can be positioned at any angle and constantly fixed against self-turning by means of spherical bodies.

I claim:

1. A drawing head for use in drawing devices having a means for moving the drawing head in the plane of a drafting board, comprising an axle, a first flat member mounted on said axle and associated with the means for moving the head in the plane of the drafting board; a second flat member securely fixed on said axle under said first member, a means for turning said second flat member relative to said first flat member; a square carrying drawing scales, said squares being loosely mounted on said axle under said second flat member; and a friction clamp connecting said square with said second flat member, said friction clamp being disposed at the end of said axle.

2. The drawing head as claimed in claim 1, in which the friction clamp is a screw and a lever rigidly affixed to the screw, with the screw being mounted in a threaded hole in the butt end of the axle.

3. A drawing head for use in drawing devices having a means for moving the drawing head in the plane of a drafting board, comprising an axle; a first flat member mounted on said axle and associated with the means for moving the head in the plate of the drafting board; a second flat member securely fixed on said axle under said first member; a means for turning said second flat member relative to said first flat member; a square carrying drawing scales; said square being loosely mounted on said axle under said second flat member; a friction clamp connecting said square with said second flat member, said friction clamp being disposed at the end of said axle, a stop secured on the square, and a hole for accomodating said stop provided in the second flat member, with said hold limiting the turning of the square relative to the second flat member from a position divisible by 5° into a position divisible by 2°30'.

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