Dec. 31, 1963 O. BUTTER 3,115,706

DRAWING MACHINE

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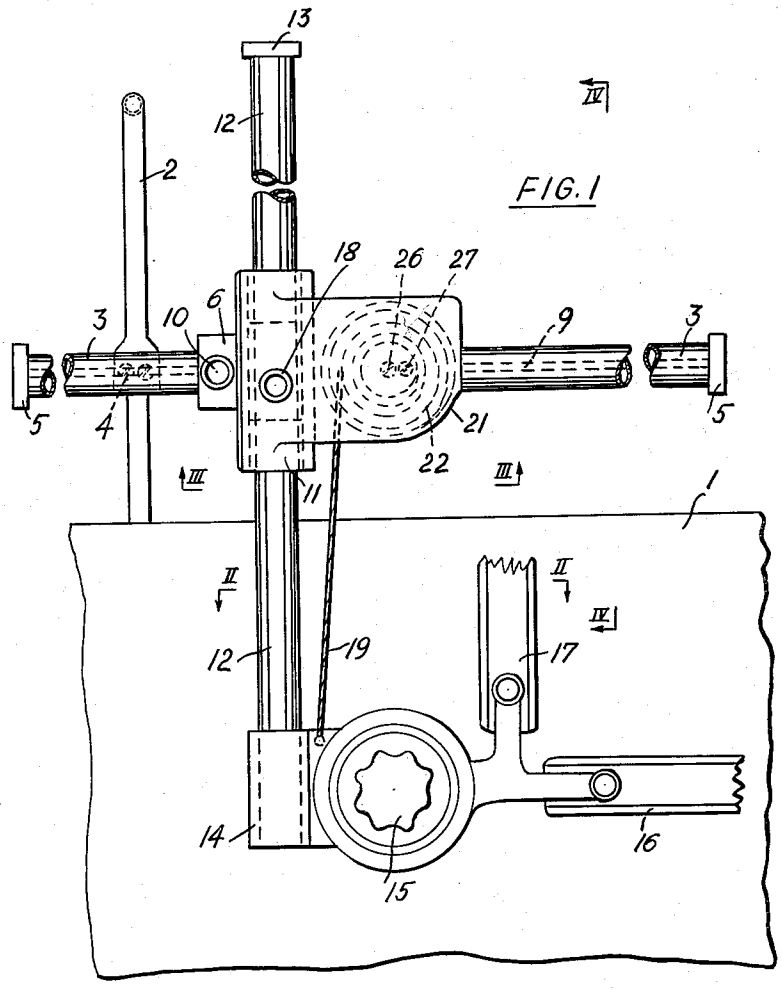


FIG. 1

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FIG. 2

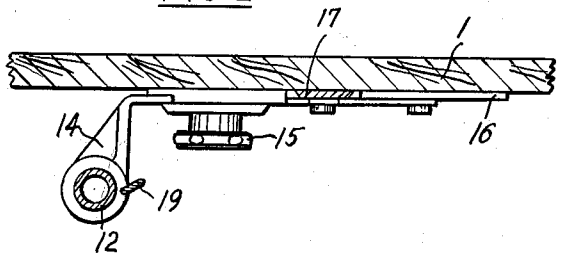
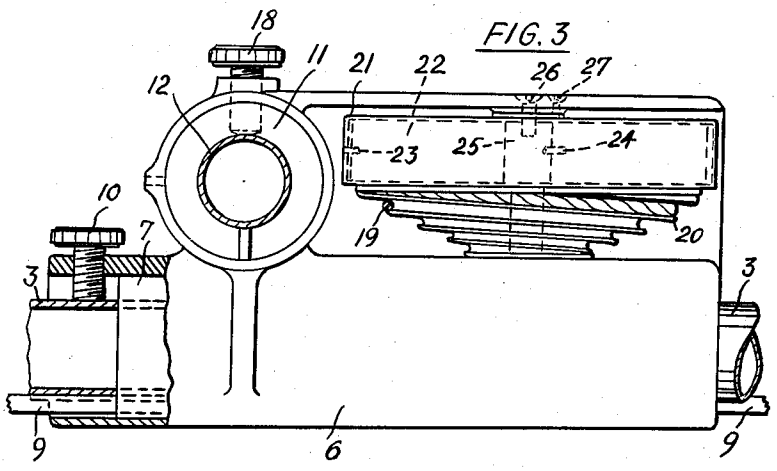


FIG. 3



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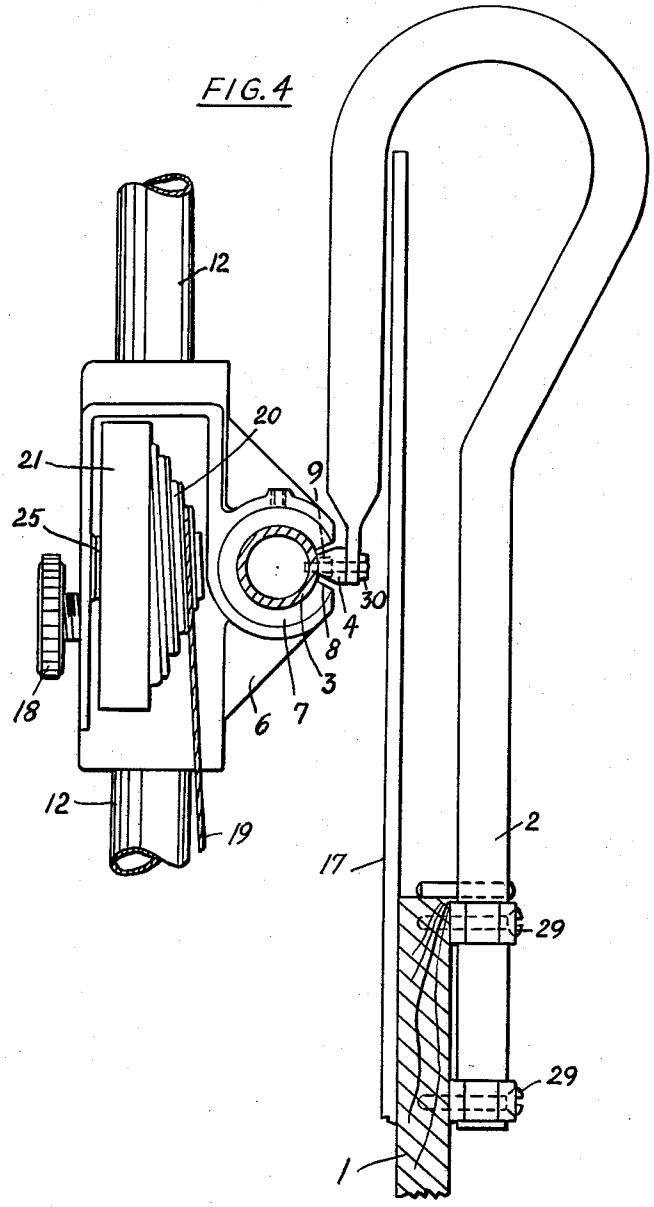
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FIG. 4



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DRAWING MACHINE

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1 Claim. (Cl. 33—79)

This invention relates to a drawing machine with a fixed horizontal guide rail near the upper edge of a drawing board and parallel to the drawing plane, on which rail a carriage is slidably arranged which has a carrier rail extending above the drawing plane and arranged at right angles to the guide rail and provided with a weight-balanced drawing machine head.

In such known drawing machines the drawing machine head is mounted on a carriage which is slidable on the vertical carrier rail. The carrier rail is guided on the lower edge of the drawing board. The objection to these known drawing machines is that the carrier rail and the carriage are always located above the drawing plane and obstruct the view of the drawing board. This is also the case when the carriage is shifted right up to the edge of the drawing board.

It is the object of the present invention to overcome this objection as to obstruction of view and to provide a drawing machine which is of more simple construction than the drawing machines hitherto known.

The invention provides a drawing machine which comprises a drawing board, a horizontal guide rail extending parallel to the drawing board near the upper edge thereof, holding means supporting the guide rail and attached to the drawing board, a carriage slidable on said guide rail and above the drawing plane, a balanced drawing machine head carried by said carrier rail, and a guide part provided on said carriage in which said carrier rail is slidable.

The drawing machine head is preferably fixed at the lower end of the carrier rail. The carrier rail and the holding rail preferably have a known circular cross-section which enables the drawing head to be lifted off the drawing plane. An abutment rail limiting the turning movement of the carriage may be provided on the guide rail.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

FIG. 1 is an elevation of a drawing machine according to the invention, fixed on a drawing board;

FIG. 2 is a section taken on line II—II of FIG. 1;

FIG. 3 is a section on line III—III of FIG. 1 on a larger scale, and

FIG. 4 is a section taken substantially on line IV—IV of FIG. 1, also on a larger scale.

With reference now to the drawings, several holding straps 2, only one of which is shown in FIGS. 1 and 4, are fitted to a drawing board 1 by means of screws 29 and carry a horizontal guide rail 3 consisting of a tube extending parallel to the drawing plane. Each holding strap 2 is connected to the guide rail 3 by means of screws 30 with interposed spacing pieces 4. Abutments 5 are provided at the ends of the guide rail 3 to limit the sliding movement of a carriage 6 shiftable on the guide rail 3. The carriage 6 has a guide part 7 composed of ball-boxes with an aperture 8 through which it is possible to shift the carriage 6 past the spacing pieces 4. Between the guide part 7 and each of the spacing pieces 4 there is a gap (play) which enables the carriage 6 to be turned through a small angle on the guide rail 3. For limiting the turning movement of the carriage 6 outside the spacing pieces 4 an abutment rail 9 is provided on the guide rail 3 and extends along the entire length thereof. The carriage 6 carries a fixing screw 10 for fixing it on the guide rail 3.

Perpendicular to the guide part 7 there is another guide part 11 which consists of a ball-box for a slidable carrier rail 12 arranged at right angles to the guide rail 3. The longitudinal displacement of the carrier rail 12 in the guide part 11 is limited by an abutment 13 arranged at the upper end of the rail 12 and by a bearing head 14 arranged at the lower end thereof. The bearing head 14 carries a known balanced drawing machine head 15 with rules 16 and 17. The bearing head 14 is angular, as shown in FIG. 2, so that the drawing head 15 rests on the drawing board 1. The carrier rail 12 can be fixed by means of a screw 18 arranged on the carriage 6. The carrier rail 12 can be turned in the guide part 11, the turning movement being limited by an abutment on the carrier rail 12 not shown in the drawings.

A pull cord 19 is attached at one end to the bearing head 14 and wound at its other end on a spiral guide 20. Connected with this spiral guide 20 is a spiral spring 22 mounted in a housing 21, one end of this spring being fixed in the housing 21 by a pin 23. The other end of the spiral spring 22 is fixed by a pin 24 to an axle 25, as shown in FIG. 3, for the spiral guide 20, which axle 25 is mounted in the housing 21. The axle 25 is fixed in the carriage 6 by two screws 26 and 27.

The pull cord 19 can be connected to a counterweight arranged on the rear side of the drawing board 1 instead of to the spring 22.

When the drawing machine head 15 is moved towards the upper edge of the board, the carriers rail 12 slides in the guide part 11, the pull cord 19 being always kept taut by the spiral spring 22. By tightening the fixing screw 18 the carrier rail 12 can be secured in position. Thereby the drawing machine head 15 can be adjusted in a known manner.

As compared with the known drawing machines, the construction described and shown presents the advantage that additional guiding at the lower end of the vertical carrier rail 12 can be dispensed with because the rules 16 and 17 form a support for the drawing machine head 15 so that an additional roller-like guide is no longer necessary.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

I claim:

A drawing machine comprising in combination, a drawing board, generally U-shaped holding straps secured at one end to the rear of the upper edge of said drawing board with the other end extending above the front face, a guide rail secured to said other end extending parallel to but spaced from the upper edge of said drawing board, a carriage including a first ball-box mounted for linear movement on said first guide rail, abutments at the ends of said guide rail limiting movement of said first ball-box on said guide rail, said first ball-box having a longitudinal groove therein, an abutment rail extending the length of said guide rail and extending through said groove precluding rotative movement of said carriage on said guide rail, a second ball-box comprising a part of said carriage and extending in perpendicular relation to said first ball-box, a carrier rail slidably movable in said second ball-box, a bearing head fixedly secured to the lower end

of said carrier rail, a balanced drawing head on said bearing head, said drawing head including a pair of right angularly disposed rules lying normally in flush relation with said drawing board and spaced from said guide rail by said generally U-shaped holding straps, a spring biased rotatable spiral guide in said carriage, and a pull cord wound on said spiral guide and having one end attached thereto, the other end being secured to said bearing head.

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