Jan. 12, 1954 R. W. BARKER ET AL 2,665,486

PERSPECTIVE DRAFTING MACHINE

Filed April 17, 1951

Fig. 1

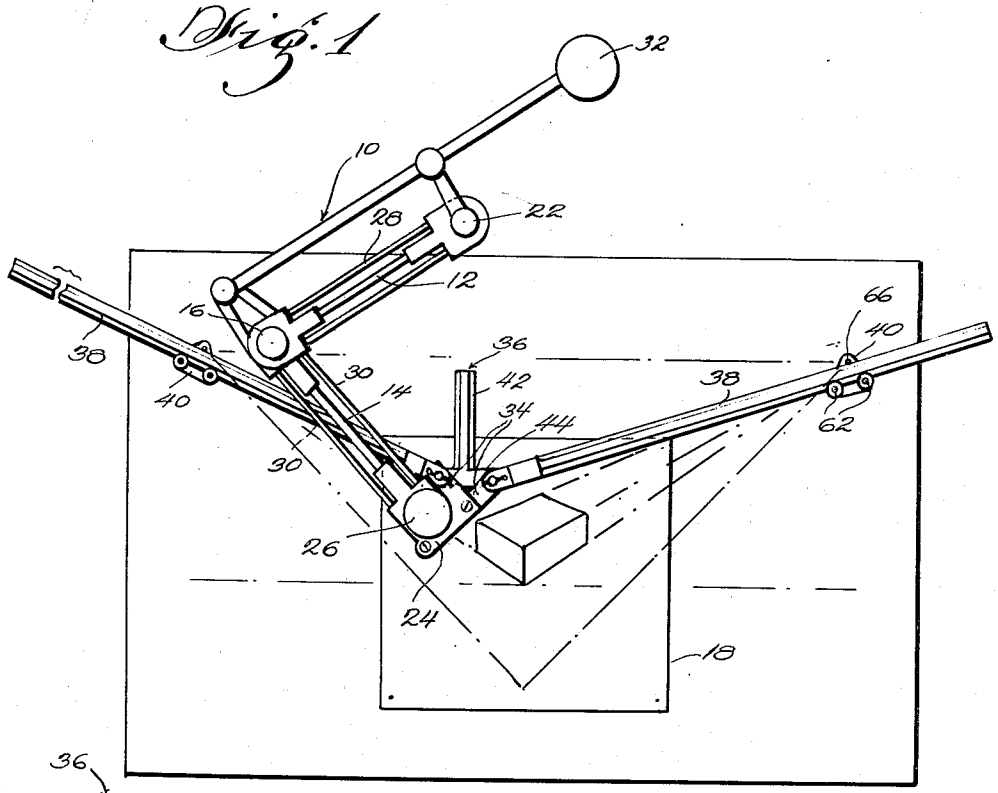


Fig. 2

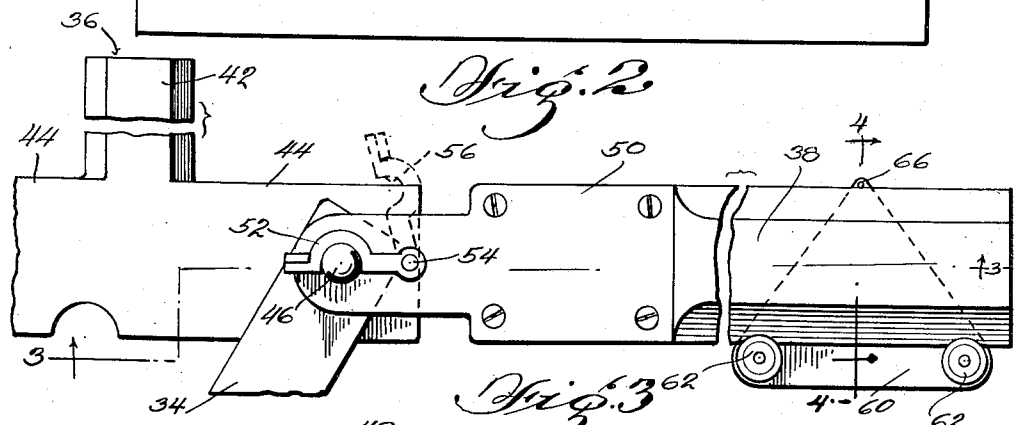


Fig. 3

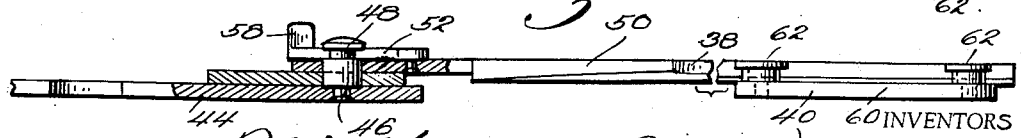
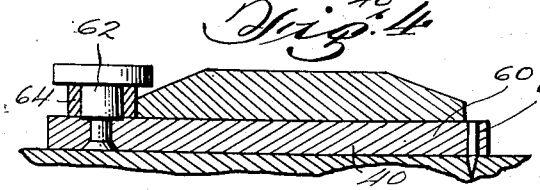


Fig. 4



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PERSPECTIVE DRAFTING MACHINE

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

The present invention relates to drafting apparatus and more particularly to a perspective drafting attachment for use with standard drafting machines.

Conventional drafting machines ordinarily comprise parallel mechanism to one end of which a working head or centerpiece is secured, while the other end is rockably secured upon an axis fixed relative to a predetermined drafting area so that the centerpiece may be moved over the drafting area in parallel relation thereto. In these machines mechanism is provided to maintain the head portion of the drafting machine in a constant angular relation to predetermined base lines, and various attachments may be releasably secured to the head for performing different drafting operations. Although perspective making attachments for drafting machines have heretofore been devised, they are not convenient to use because they are not readily connectable to or disconnectable from the machine and are relatively complicated in construction and operation. Accordingly, it is an object of the present invention to provide a perspective drafting attachment for use with standard drafting machines which is readily operatively connectable with a drafting machine or disconnectable therefrom.

Another object of the invention is to provide a new and improved perspective making attachment for drafting machines which is sturdy and compact in construction, inexpensive to manufacture and fool proof and simple in operation so that extensive training is not required to use the same.

A further object of the invention is to provide a new and improved perspective drafting attachment which may readily be adapted for use on any one of the various standard drafting machines.

These and other objects, advantages and capabilities of the invention will become apparent from the following description wherein reference is had to the accompanying drawing in which:

Fig. 1 is a top plan view of a drafting machine with the improved perspective making apparatus of the present invention connected thereto and showing in phantom several different vertical and diagonal lines made by the perspective making apparatus;

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Fig. 2 is a fragmentary top plan view of the perspective making apparatus on a somewhat enlarged scale and in extended position;

Fig. 3 is a side elevational view, partly in section, of the perspective making apparatus shown in Fig. 2; and

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 2.

By way of example, there is shown in Fig. 1 a conventional drafting machine 10 with which the perspective drafting apparatus of the present invention is particularly adapted to be used. Briefly to describe the construction of this machine, it will be noted that it includes parallel mechanism comprising a pair of arms 12 and 14 pivotably interconnected at 16 and supported for movement over a drafting area 18 in parallel relation thereto upon a suitable clamp support (not shown). This clamp support is fixedly anchored by any suitable means to the drafting table upon which drafting area 18 is defined at a predetermined position relative to the latter. The parallel mechanism is secured to the clamp support by a pivot connection 22 adjacent the end of arm 12 opposite pivot connection 16 so that the parallel mechanism is freely swingable over drafting area 18 in parallel relation thereto.

Pivotally supported upon the end of arm 14 opposite its pivotal connection with arm 12 is a centerpiece or head 24. A hand grip 26 is also fixed adjacent this end of the parallel mechanism for convenience in manipulating the same. By means of suitable mechanism of conventional construction including metal tapes or bands 28 and 30, the head 24 is maintained at a predetermined angular position relative to the horizontal and vertical base lines of the drafting area 18. Operatively connected to the parallel mechanism is a counterweight 32 to brake the action thereof and thus facilitate operation of the drafting machine, particularly upon inclined drafting tables.

The head 24 has a pair of right angularly disposed arms 34 thus forming a yoke to which scales or straight edges conventionally are attached but which in the machine of the present invention have the improved perspective apparatus attached thereto. This apparatus comprises an adapter 36 and a pair of elongated arms 38 having a slidable connection with rockable cradles 40 disposed on opposite sides of the drafting area 18.

The adapter is of generally inverted T shape and has a leg 42 (Fig. 2) and oppositely disposed branches 44 normal to leg 42. The elongated

sides of leg 42 are formed to provide straight edges. Fixed to the branches 44 adjacent the outer ends thereof and upstanding therefrom is a pair of pivot studs 46 (Fig. 3) which have a circumferential groove 48 adjacent their free ends. The elongated arms 38 are each provided with a projecting lug 50 rigidly secured thereto by means of screws or rivets, and the opposite elongated edges of these arms are finished to form true straight edges. Apertures are provided adjacent the free ends of these lugs which are adapted to engage loosely enough over the pivot studs 46 to allow the elongated arms 38 to be rocked on the studs but yet tightly enough to prevent wobbling of the arms. Thus, the head or yoke 24, adapter 36 and elongated arms 38 may readily be detachably interconnected by passing the pivot studs 46 through apertures in arms 34 on yoke 24 and then engaging the apertured lugs 50 on the elongated arms 38 over pivot studs 46 with the arms extending in opposite lateral directions from the head 24. The arms 38 thus are free to pivot upon the studs 46 as an axis. The parts are held in this relation by manually releasable latches 52 pivotally secured at 54 to the lugs 50. These latches each have a generally semi-circular hook shaped recess 56 (best seen in phantom in Fig. 2) which is adapted snugly to engage in the peripheral groove 48 in a pivot stud 46 to hold the yoke, adapter and arms in assembled relation. A fingerpiece 58 (Fig. 3) on each of the latches 52 is provided to facilitate the manipulation thereof so that the latch may readily be swung between the full line position shown in Fig. 2 and the phantom line position shown in the same view to facilitate connection of the drafting attachment to the parallel mechanism and its disconnection therefrom.

A predetermined movement is imparted to the elongated arms 38 in response to movement of the head 24 by virtue of the cooperative action of the rockable cradles 40 and the connection between the elongated arms 38 and head 24. Each of these cradles comprises a rigid generally triangular shaped base 60 (Fig. 2) having a pair of shouldered arm-guiding studs 62 fixed thereto. These studs have enlarged heads for loosely retaining sleeve bearings 64 (Fig. 4) on their shanks and to assist in retaining the elongated arms 38 properly engaged with the cradle when the perspective apparatus is in use. Each cradle 40 is rockably secured upon a pin 66 fixed in the drafting table and extending relatively loosely through an aperture in the apex of base 60 opposite the guide studs 62 so that the cradle is free to rock on the pin as an axis.

From the above description of the construction of the improved perspective drafting apparatus, the manner of using the same and its advantages should be obvious. After the adapter 36 and elongated arms 38 have been connected to the head 24 in the manner previously described and the vanishing points on opposite sides of the drafting area 18 established for a particular view, the pins 66 are driven into the drafting table at these vanishing points. The cradles 40 are then engaged upon the pins 66 and the lower edges of elongated arms 38 brought against the sleeve bearings 64 on guide studs 62.

As previously explained, the arms 34 on head or yoke 24 bear a predetermined angular relation to the vertical and horizontal base lines of the drafting area 18. This relation is such and the branches 44 on the adapter 36 are connected to the arms 34 on the yoke at such a point that

the elongated edges of the leg 42 on the adapter will be maintained in a position to form a guide for drawing vertical lines on the drafting area irrespective of the position on that area to which the adapter is moved by the parallel mechanism. Moreover, since the elongated arms 38 adjacent their outer ends engage with the cradles 40 which are pivotable on the vanishing points for the view being made in the drafting area 18, the elongated edges of these arms are inclined relative to the elongated edges of leg 42 at the proper angle to define the diagonal lines for a perspective view in the drafting area.

It will thus be apparent that the perspective drafting attachment is easy to use because the vertical guide formed by leg 42 is readily positioned wherever desired by manipulation of the parallel mechanism and the elongated edges of arms 38 are simultaneously and automatically moved to the proper position to define diagonals for a perspective view. Several illustrative diagonal lines drawn with the attachment are shown in phantom in Fig. 1. It is also to be noted that connection or disconnection of the perspective drafting mechanism and a drafting machine may readily be effected because this requires merely release of the latches 52 and disengagement of the lugs 50 on arms 38 from pivot studs 46.

This ease of connection and disconnection arises at least in part from the exceedingly simple construction of the present perspective making attachment. This simplicity in construction has the further advantage of greatly reducing cost of manufacture of the device and the likelihood of wear or mal-functioning in its use.

While a preferred embodiment of the invention has been shown and described, it will be apparent that numerous variations and modifications thereof may be made without departing from the underlying principles of the invention. It is desired, therefore, by the following claims, to include within the scope of the invention, all such variations and modifications by which substantially the results of the invention may be obtained through the use of substantially the same or equivalent means.

We claim:

1. A drafting machine comprising parallel mechanism adapted to be anchored adjacent one end thereof for movement over a predetermined drafting area, adapter means including a straight edge, pintles operatively to connect said adapter means to said parallel mechanism at spaced points so as to generate forces when the parallel mechanism is moved over the drafting area effective to maintain the said straight edge in a position to form a guide for drawing vertical lines on said drafting area, a pair of elongated straight edges each pivotally connected by said pintles to said adapter means and adapted to extend laterally respectively in opposite directions therefrom, and a pair of cradles to control the angularity of the elongated straight edges, said cradles being rockable upon fixed axes coinciding substantially with the vanishing points respectively on opposite sides of the drafting area so as to constrain said elongated straight edges to lie upon the diagonals of a perspective view in said drafting area when the said straight edges are in cooperative relation with the cradles irrespective of the position to which the adapter means is moved.

2. A drafting machine comprising parallel mechanism adapted to be anchored for move-

ment over a predetermined drafting area, an operating head maintained at a predetermined angle with respect to said drafting area by said parallel mechanism, a generally T-shaped adapter having a straight edged leg and branches extending in opposite directions therefrom, a pair of elongated arms having elongated straight edges formed thereon, a plurality of studs fixed to one of said parts, the others of said parts having apertures loosely to receive said studs for interconnecting the operating head and adapter at spaced points in a fixed predetermined relationship so as to cause forces to be exerted on the adapter effective to maintain its leg in a position to form a guide for drawing vertical lines at all positions of the head over said drafting area and pivotally connecting one end of the elongated arms respectively to the operating head and adapter at the said spaced points, and cradles on opposite sides of said drafting area adapted slidably to receive said elongated arms respectively, said cradles being rockable upon fixed axes coinciding substantially with the opposite lateral vanishing points for said drafting area so that the straight edges on said elongated arms define the diagonals for a perspective in the drafting area.

3. Perspective drafting apparatus for use in conjunction with drafting machines having mechanism for maintaining an operating head at a predetermined angularity relative to a drafting area while the head is moved over the area comprising an adapter having a straight edge formed thereon, means for operatively connecting said adapter and said operating head to render the latter effective to maintain the straight edge on the adapter positioned to form a guide for drawing vertical lines irrespective of the position to which the operating head may be moved over said drafting area, said connecting means ncluding a pintle on one side of said vertcal straight edge, an elongated straight edge pivotally connected to said head by said pintle and adapted to extend laterally to one side of said head, and a cradle rockable upon a fixed axis coinciding substantially with the vanishing point for a perspective view in said drafting area and adapted when said elongated straight edge is cooperatively engaged therewith to maintain the latter at a position to form a guide for the diagonals of the said perspective view.

4. Perspective drafting apparatus for use in conjunction with a drafting machine having mechanism for maintaining a forked operating head at a predetermined angle relative to a drafting area while the head is moved over the area comprising a generally T-shaped adapter having opposed branches and a straight edged leg, means to secure the forked operating head and adapter together in a predetermined relationship rendering said head effective to maintain the leg of said adapter in a position to form a guide for drawing vertical lines in said drafting area irrespective of the position over the area to which the head is moved including a stud adjacent each of the extremities of the forked head and branches, said studs each having a portion thereon defining a pintle, a pair of elongated straight edges pivotally received respectfully upon the portions of the studs defining pintles and adapted to extend laterally respectively in opposite directions from said head, and a pair of cradles, said cradles being rockable on fixed axes coinciding substantially with the opposite lateral vanishing points of a perspective view in said drafting area and being adapted slidably to receive said elongated straight edges adjacent their free ends to render the cradles effective to cooperate with said head in maintaining the straight edges at an angle coinciding with the diagonals of such a perspective view.

5. Perspective drafting apparatus for use in conjunction with drafting machines having mechanism for maintaining an operating head at a predetermined angularity relative to a drafting area while the head is moved over the area comprising an adapter having a straight edge formed thereon, a pair of elongated straight edges, means including a pair of pintles to form an operative connection between said head, adapter and elongated straight edges effective to maintain said adapter in a position to form a guide for drawing vertical lines on said drafting area at whatever position the head is placed over the area, said pintles having peripheral slots formed therein, cradles on opposite sides of said drafting area to guide movement of said elongated straight edges when the head is moved so as to maintain said straight edges at the proper angle to form guides for the diagonals of a perspective view in the drafting area, and rockable latches each having a generally semicircular shaped recess adapted to engage in the peripheral slots in said pintles releasably to lock said parts for relatvie pivotal movement when the head, adapter and elongated straight edges are in assembled relation.

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