March 15, 1932. M. C. MAGARIAN 1,849,305

OPTICAL BENCH

Filed Sept. 27, 1929

Fig. 1

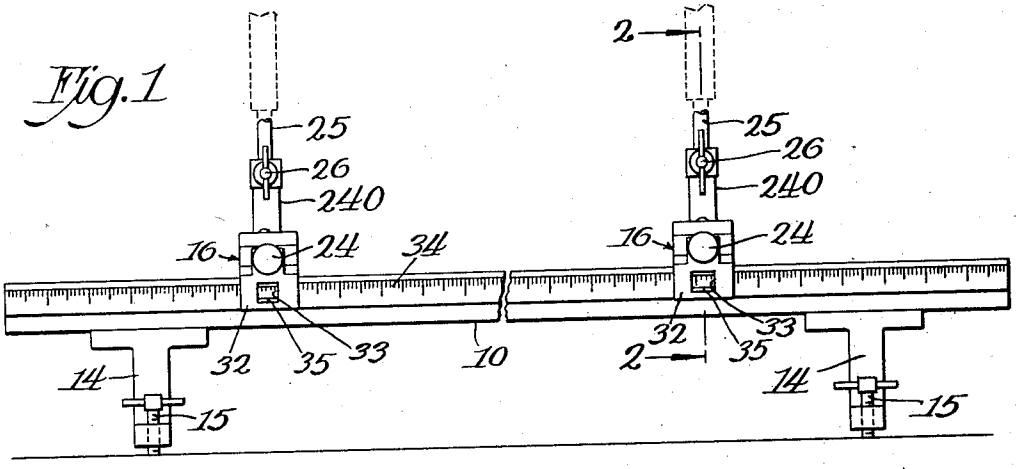


Fig. 2

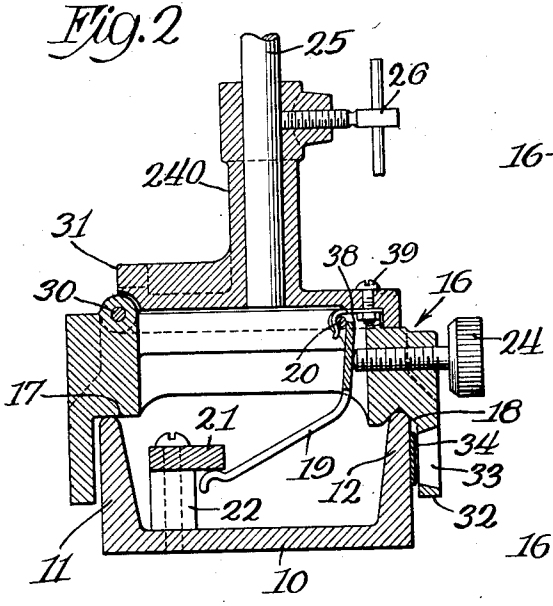


Fig. 4

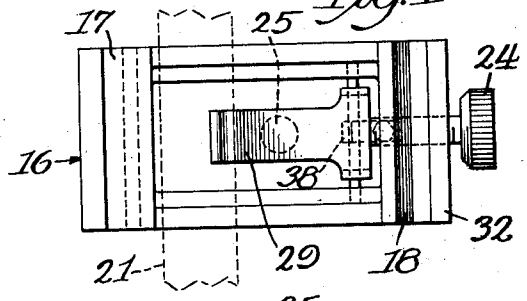


Fig. 5

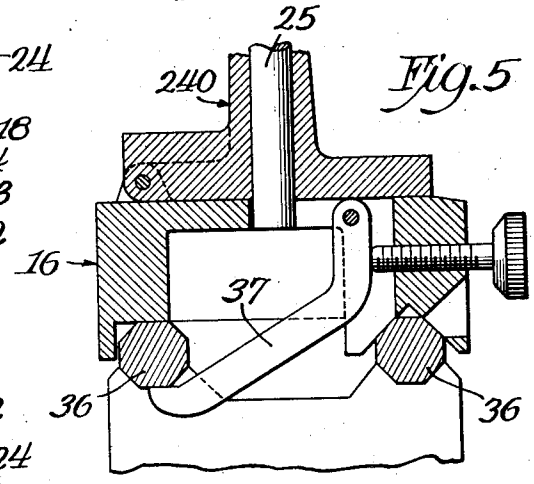
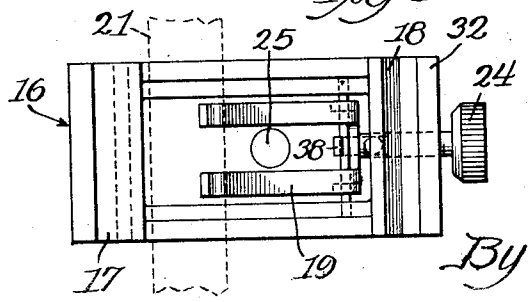


Fig. 3



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UNITED STATES PATENT OFFICE

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OPTICAL BENCH

Application filed September 27, 1929. Serial No. 395,726.

This invention relates to optical benches and, among other objects, aims to provide improved apparatus of this character which may be easily set up and adjusted.

The nature of the invention may be readily understood by reference to an illustrative construction embodying the same and shown in the accompanying drawings, in which:

Fig. 1 is an elevation of an optical bench having arbitrarily selected accessories set up thereon;

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1;

Fig. 3 is a bottom plan view of the clamping device shown in Fig. 2;

Fig. 4 is a bottom plan view similar to that of Fig. 3 showing a different form of clamping arm;

Fig. 5 is a section similar to that of Fig. 2 of a clamping device arranged for a different type of optical bench.

Optical benches of the type heretofore employed have been found to lack a certain degree of permanency and rigidity greatly to be desired. They have also been found to be deficient in the unhandy and inconvenient manner in which the accessories are clamped to the bench and the adjustments made. Among other advantages the illustrative apparatus not only possesses great permanency, but it may be easily set up for a given experiment and the adjustments easily and quickly made.

The illustrative bench is of the lathe bed type in which the lathe bed, in the form of a channel 10, comprises a pair of rails 11 and 12 represented by the channel flanges. The bed is supported upon adjustable supports 13 and 14, in which the level of the apparatus may be adjusted by hand screws 15.

Associated with the bed and longitudinally slidable on the rails thereof are carriages 16 of channel form and having a plane rail engaging surface 17 on one side and a V-groove surface 18 for engaging the opposite rail, the V-groove serving to prevent transverse shifting of the carriage relative to the rails and maintaining alinement of the accessories when adjusted on the bench. The carriage is held on the bed in adjusted position by a clamping device in the form of an arm 19 pivoted at one end at 20 to the carriage and frictionally engaging an auxiliary rail 21 in the interior of the channel 10 adjacent the other end.

In the present case the clamping effect is secured by the engagement of the arm upon the under surface of the auxiliary rail 21 extending longitudinally of and on the interior of the channel and supported in spaced relation to the bottom thereof by the posts 22. The resultant force exerted by the arm against the rail is perpendicular to the plane of the rails, the arm being arched as at 23 to provide a suitable surface for engagement with the horizontal rail surface. In the present case the arm is constructed and arranged and its pivot is so located that when it is withdrawn from contact with the rail 21 to release the clamping action, it also clears the rail so that the carriage may be easily lifted and removed from the bed. The clamping arm is controlled by a thumb screw 24 and pressed into clamping engagement with the rail thereby. Upon withdrawal of the thumb screw the arm swings down under the influence of gravity.

The carriage is provided with means in the form of an axially bored pedestal 240 for supporting accessories used in connection with experiments on the optical bench. Such accessories are usually mounted upon a rod, such as a rod 25, which may be inserted into the pedestal and clamped at any desired elevation by clamping screw 26.

In the preferred embodiment of this invention, the clamping arm 19 is bifurcated (Figs. 2 and 3) to insure a more positive clamping of the carriage to the bench, and in addition to allow a greater latitude in the vertical adjustment of the accessory rod 25.

However, a single arm may effectively be employed, if desired, as illustrated by the arm 29 in the modified construction shown in Fig. 4.

For temporarily moving a given accessory out of the optical line of the bench, the pedestal 240 is advantageously hinged to the carriage at 30, to permit it to be swung back out of the effective optical line of the bench. A

stop 31 holds the pedestal and its accessory in approximately horizontal position when it is thrown back.

The front skirt 32 of the carriage is provided with a window 33 through which the scale 34 of the bench is visible. A suitable index or marker 35 facilitates the accurate reading of the scale.

The clamping mechanism may be readily designed for optical beds having a different bed or rail construction. For example, in Fig. 5 is illustrated an optical bed whose rails are provided by separate rods 36, in this case octagonal in form, and the clamping arm 37 is made of a length to engage the under face of one of these rails instead of an auxiliary rail. The rail engaging surfaces are similar to those in the preferred form (Figs. 2 and 3) i. e, one being a plane surface and the other V-shaped in cross section.

The base and the accessory holder castings are shown in the drawings (Fig. 5) of somewhat different form from those in the preferred form (Fig. 2 and 3), and illustrates one of the many forms of which this invention is susceptible. In this particular embodiment the arm 37 is of heavier construction and is pivotally mounted in a slot formed in the base. The lower extremity of the arm 37 is provided with a surface complementary to the under face of the rod 36 to insure positive locking engagement therewith.

In all three designs of clamping device it is apparent that when the clamping arms are dropped they not only release the clamping engagement but clear the bed to permit the carriage to be freely lifted from the bed.

In using the apparatus for various optical experiments a number of carriages may be adjusted on the bench.

In the event it is desired to remove any given accessory, such as a lens, from the line of a beam of light, it is merely necessary to tilt back the pedestal holding the supporting rod. Thus, any given optical object may be restored to position promptly without the necessity of preliminary adjustment.

A locking device may be provided if desired to maintain the accessory holder in the optical line of the bench. This may take the form for example, of a snap spring 38 secured to the base of the pedestal 240 by a screw and nut 39, the free end of the spring being adapted to engage the clamping arm pivot in the manner shown in the drawings. Although no such locking device is illustrated in connection with the modified form of Fig. 5, one could be employed if desired.

Obviously the invention is not limited to the details of the illustrative apparatus since these may be variously modified. Moreover, it is not indispensable that all features of the invention be used conjointly since various features may advantageously be employed in different combinations and subcombinations.

I claim as my invention:

1. A device of the character described comprising in combination, a longitudinally extending bed, an apparatus supporting carriage longitudinally slidable on said bed, and a clamping arm pivotally connected to said carriage for engaging said bed to clamp the carriage thereon, and means for controlling said arm.

2. A device of the character described comprising in combination, a bed providing longitudinally extending guiding rails, an apparatus supporting carriage resting on said rails and longitudinally adjustable thereon, a clamping arm pivotally carried by said carriage and engageable with said bed to clamp the carriage in adjusted position, and screw means for actuating said arm.

3. A device of the character described comprising in combination a bed having upstanding rail members, a carriage mounted on said members for longitudinal movement thereon, means for clamping said carriage to said bed including an auxiliary rail secured to the latter and an arm pivoted to the carriage and adapted to engage the said auxiliary rail.

4. A device of the character described comprising in combination a bed having upstanding rail members, a carriage mounted on said members for longitudinal movement thereon, means for clamping said carriage to said bed including an auxiliary rail secured to the latter and a bifurcated arm pivoted to the carriage and adapted to engage the said auxiliary rail.

5. A device of the character described comprising in combination, a bed providing longitudinally extending guiding rails, an apparatus supporting carriage resting on said rails and longitudinally slidable thereon, a clamping arm pivotally connected to said carriage and hanging between said rails, said arm having an angular extension thereon designed to engage a downwardly facing surface on said bed, and means for moving said arm into engagement with said surface to clamp said carriage in place.

6. A device of the character described comprising in combination, a bed providing longitudinally extending guiding rails, an apparatus supporting carriage having downwardly extending flanges provided with rail engaging surfaces, a clamping arm carried by said carriage and hanging between said rails, said arm being engageable with said bed, and an actuating screw passing through one of said flanges into engagement with said arm to force said arm into clamping contact with said bed.

7. An optical bench of the character described comprising in combination, a bed providing longitudinally extending guiding rails, an apparatus supporting carriage resting on said rails and longitudinally slidable thereon, means for holding said carriage in

adjusted position along said rails, an apparatus holding device and means for connecting said device to said carriage so that said device and its apparatus may be moved laterally out of the optical line of the bed without disturbing the carriage or disconnecting said holding device therefrom.

8. An optical bench of the character described comprising in combination, a bed providing longitudinally extending guiding rails, an apparatus supporting carriage resting on said rails and longitudinally slidable thereon, clamping means for removably holding said carriage on said bed and for clamping said carriage in adjusted position on said rails, and an apparatus holding device pivoted to said carriage so that said device and its apparatus may be swung out of the optical line of the bed.

9. An apparatus supporting carriage for optical benches and the like comprising in combination a base structure having rail engaging surfaces for slidably engaging the bench rails, clamping means for holding said carriage in adjusted position on the bench, and an apparatus holding device hinged to said base to permit said device and the apparatus held thereby to be swung out of the optical line of said bench.

10. An apparatus supporting carriage for optical benches and the like comprising in combination a base structure having rail engaging surfaces for slidably engaging the bench rails, clamping means for holding said carriage in adjusted position on the bench, an apparatus holding device hinged to said base to permit said device and the apparatus held thereby to be swung out of the optical line of said bench, and means for resiliently securing the said holding device in operative position with relation to the base.

11. An apparatus supporting carriage for optical benches and the like comprising in combination a base structure having rail engaging surfaces for slidably engaging the bench rails, clamping means for holding said carriage in adjusted position on the bench, an apparatus holding device mounted on the base, means connecting said device to the base whereby the former may be quickly moved laterally from the optical line of the bench, and means for limiting the lateral displacement of the holding device.

In testimony whereof I affix my signature.

MASICK C. MAGARIAN.