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2,435,849

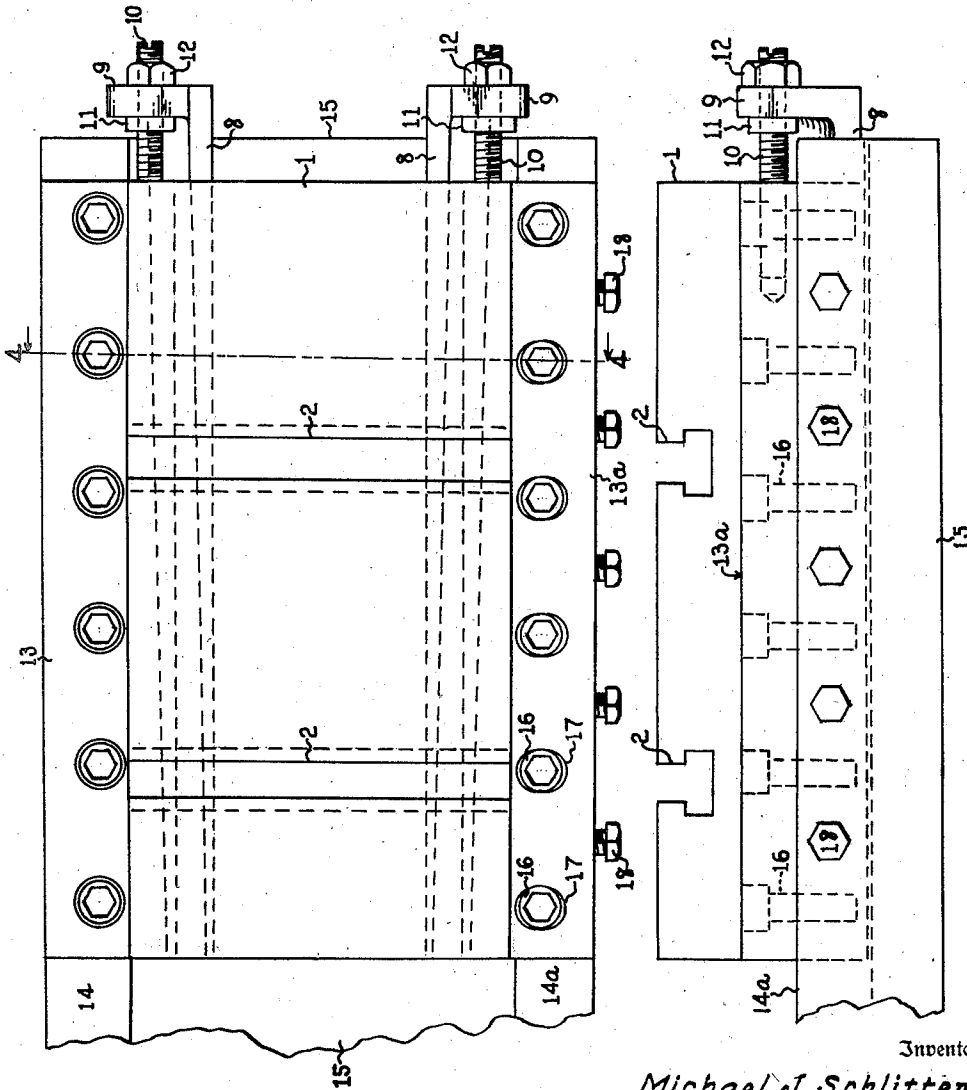
SLIDE ASSEMBLY FOR MACHINE TOOLS

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2 Sheets-Sheet 1

Fig. 1.

Fig. 2.



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2 Sheets-Sheet 2

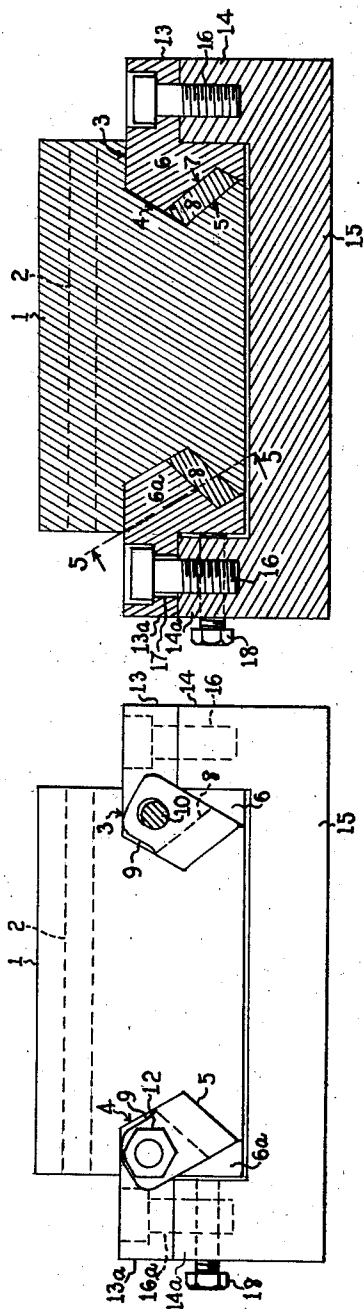


Fig. 4.

Fig. 3.

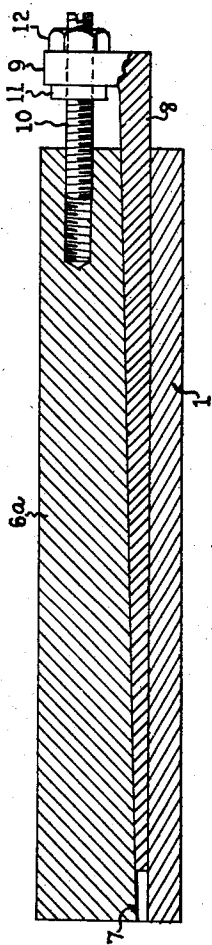


Fig. 5.

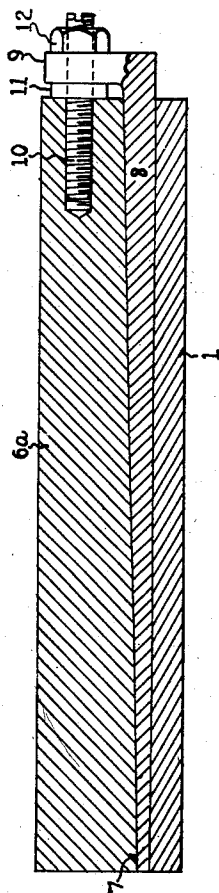


Fig. 6.

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SLIDE ASSEMBLY FOR MACHINE TOOLS

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5 Claims. (Cl. 308—3)

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This invention relates to machine tool slide assemblies, particularly screw machine slide assemblies.

The slides of screw machines are required to carry many different types of tools and to very accurately guide such tools in their approach to and retraction from the work and in their cutting operations. Frequently heavy stresses are imposed on said slides in the course of their travel, the direction of such stresses varying considerably in different tool operations. Consequently such slides and their guides are subject to considerable wear and it is necessary from time to time to compensate for wear to avoid rocking or swaying of the tools or other deviation from accurate rectilinear travel. It is to be noted in this connection that a slight lateral play of a slide in its guideways is often considerably multiplied at the cutting edge of the tool.

Objects of the invention are to materially increase the extent of the slide bearing surfaces as compared to prior practice; to adapt such surfaces to adequately resist stresses acting at any angle to slide travel; to provide a considerably greater range of adjustment for wear than has heretofore been available, and still afford a quite fine adjustment at all times; and to eliminate play in either or both of two transverse directions by a single adjustment.

These and various other objects are attained by the construction hereinafter described and illustrated in the accompanying drawings, wherein:

Fig. 1 is a top plan view of the improved slide and its mounting.

Fig. 2 is a side elevational view of the same.

Fig. 3 is a rear end view of the slide and its mounting.

Fig. 4 is a cross sectional view of same taken on the line 4—4 of Fig. 1.

Fig. 5 is a longitudinal sectional view taken on the line 5—5 of Fig. 3, and showing a fully retracted position of a sliding wear-compensating gib.

Fig. 6 is a view similar to Fig. 5 showing the gib in its fully inserted position.

In these views, the reference character 1 designates an elongated rectangular slide having a plurality of undercut grooves 2 extended transversely across its top face to facilitate the mounting on said face of any desired tool holder (not shown). The lower portion of the slide is reduced in width by recesses similarly extended inward from its sides and having horizontal top faces 3, plane faces 4 extending downwardly and inwardly from

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said top faces, and plane faces 5 extending from the faces 4 to the slide bottom at an outward inclination, the faces 4 and 5 thus jointly being of an approximate V-form.

Fitted into the described recesses and supporting the slide is a pair of opposed guide rails 6 and 6a fully engaging the slide faces 3, partially engaging the faces 4 and having faces 7 spaced from the slide faces 5 and converging gradually toward the last-mentioned faces from end to end of the rails. Fitted between and conforming to the slide faces 5 and rail faces 7 is a pair of tapered gibs 8 formed at their thicker ends with upwardly projecting lugs 9 apertured to accommodate studs 10 set adjustably into the adjacent rail ends. Said gibs may be considered as adjustable elements of the rails, since they are held by the rails and contribute to the rail functions. The studs 10 rigidly carry collars 11 for abutting the lugs 9 and further carry nuts 12 for locking the lugs against said collars, whereby any adjustment is accurately maintained.

The top portions of the rails comprise seating members 13 and 13a extending the full rail lengths and outwardly projecting to seat on the upstanding walls 14 and 14a of a channel-shaped support 15 incorporated in the frame of a screw machine or other machine tool. The lower portion of the slide occupies the channel of said support, having however a slight upward clearance from the support. Rows of headed studs 16 normally clamp the rails 6 and 6a rigidly to the walls 14 and 14a, and the stud-receiving openings 17 of at least one of the rails, as 6a, having a slight elongation transverse to the rail, whereby the latter may be adjusted slightly to and from the slide. To facilitate such adjustment, it is preferred to mount a plurality of studs 18 transversely in the wall 14a, their ends bearing on the rail 6a and permitting its accurate positioning when the studs 16 have been loosened.

The described construction permits maintenance of an accurate guidance of the slide which guidance, as heretofore stated, is vital to its use. When the lateral or vertical play of the slide becomes objectionable, the operator loosens the lock nut 12 and then forces the gibs 8 inwardly by turning the studs 10 until such play is fully eliminated. The very gradual taper of the gibs permits an essential nicety of adjustment, affording free travel of the slide but no deviation from a straight line movement. The increased insertion of the gibs takes up any play of the bearing surfaces 3 and 5, the convergency of these faces being such that their engagement by the rail and

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gib eliminates both vertical and lateral play of the slide. When, by a succession of adjustments, the gibs have been inserted as far as permitted by the collars 11, the studs 10 are screwed out a proper distance correspondingly retracting the gibs. The operator now loosens the clamping studs 16 and by means of the studs 18 adjusts the rail 6a inwardly until the gibs are fully engaged without applying undue pressure to the slide. The rail having been clamped in this new position, the gibs may be again used as before for a succession of fine adjustments. The available number of repetitive full adjustment strokes of the gibs is thus limited only by the amount of lateral elongation of the apertures 17 and this elongation may be sufficient for the maximum useful life of the slide.

Reference has so far been made only to wear occurring between the surfaces 3 and 5 of the slide and the opposing surfaces of the rails and gibs. Wear will also occur between the slide faces 4 and opposing surfaces each jointly formed by a rail and gib. Such wear will not be taken up through inward adjustment of the gibs, but is fully taken up each time the rail 6a is adjusted inwardly following a retraction of the gibs.

Improvement is made over prior constructions in the large amount of aggregate wear for which compensation is provided, in the extensive surfaces on which the wear is distributed, and also in the ease and accuracy with which such compensation is made.

What I claim is:

1. In a slide assembly for machine tools, the combination with a slide having opposite side faces and formed with recesses extending toward each other from said side faces, each recess having a top face substantially parallel to the top face of the slide and a bottom face convergent toward said top face, of a pair of guide rails for the slide fitted in said recesses and engaging said top faces of the recesses to support the slide, at least one of said rails having a face spaced from and gradually converged toward the bottom face of the corresponding recess, such rail comprising a tapered gib inserted between and engaging said converged faces of such rail and the corresponding recess, means connecting the gib to its rail for increasingly inserting the gib between its rail and the slide to compensate for wear, a support on which both rails are mounted, means for securing the rails to such support, and means for adjusting one of said rails toward the other rail to an extent materially exceeding the wear adjustment effected by the gib.

2. In a slide assembly for machine tools, the combination with a slide having opposite side faces and formed with recesses extending toward each other from said side faces, each recess having a top face substantially parallel to the top face of the slide and a bottom face convergent toward said top face, of a pair of guide rails for the slide fitted in said recesses and engaging said top faces of the recesses to support the slide, at least one of

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said rails having a face spaced from and gradually converged toward the bottom face of the corresponding recess, such rail comprising a tapered gib inserted between and engaging said converged faces of such rail and the corresponding recess, means connecting the gib to its rail for increasingly inserting the gib between its rail and the slide to compensate for wear, a support on which both rails are mounted, and a plurality of clamping connections between each rail and said support, at least one of said rails having oversized openings to accommodate the corresponding clamping connections, affording an inward adjustment of such rail materially exceeding the wear adjustment effected by the gib.

3. In a slide assembly for machine tools as set forth in claim 2, a plurality of adjustment screws threaded in said support and terminally bearing on the rail having oversized openings, to effect an accurate inward adjustment of such rail.

4. In a slide assembly for machine tools, the combination with a slide and a pair of guide rails between which the slide reciprocates, a tapered gib inserted between the slide and one of said rails, means connecting such gib to the adjoined rail for increasingly inserting the gib between such rail and the slide to compensate for wear, and means for adjusting one of said rails toward the other rail to an extent materially exceeding the wear adjustment effected by the gib.

5. In a slide assembly for machine tools, the combination with a slide and a pair of guide rails between which the slide reciprocates, a tapered gib inserted between the slide and one of said rails, means for increasingly inserting the gib between such rail and the slide and holding it selectively inserted to compensate for wear, and means for adjusting one of said rails toward the other rail to an extent materially exceeding the wear adjustment effected by the gib.

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