July 16, 1963 W. J. DUNCAN 3,097,614

TABLE EXTENSION SLIDE MECHANISM

Filed April 26, 1962 3 Sheets-Sheet 1

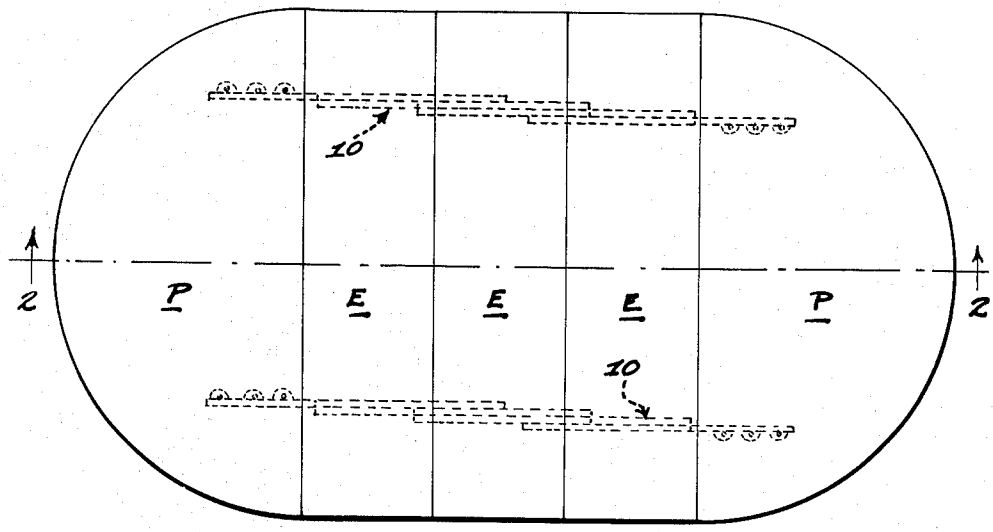


Fig. 1

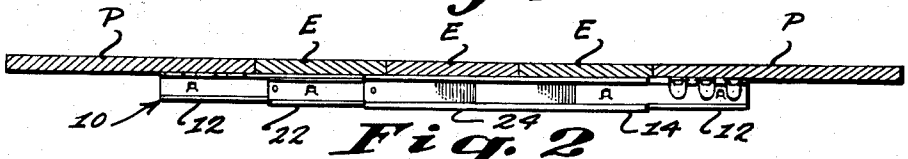


Fig. 2

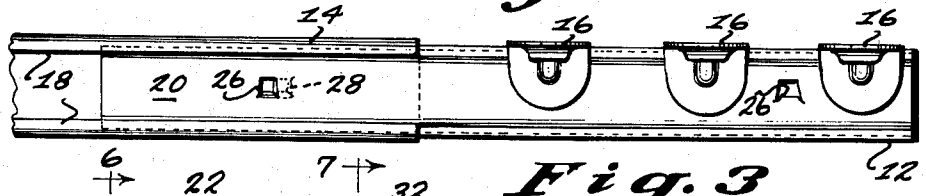


Fig. 3

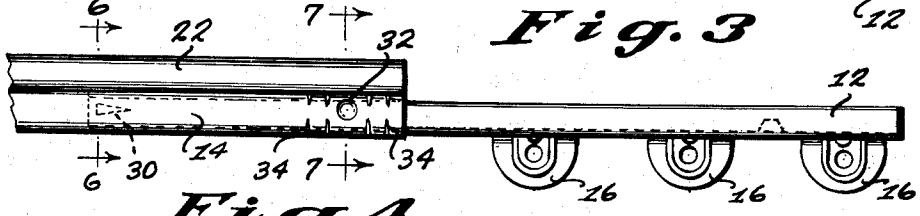


Fig. 4

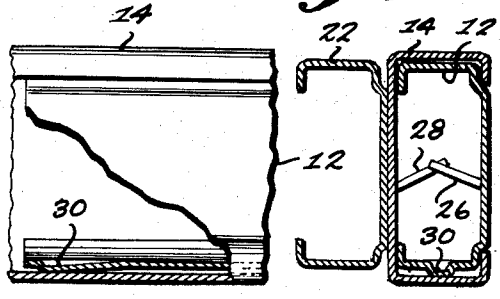


Fig. 5

Fig. 6

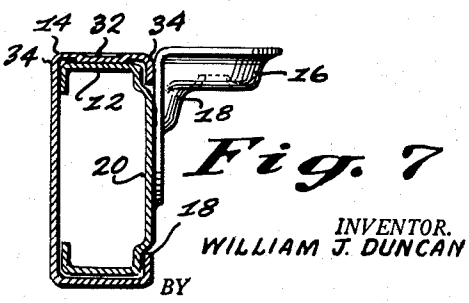


Fig. 7

INVENTOR.
WILLIAM J. DUNCAN

BY

Channing L. Richards
ATTORNEY

July 16, 1963 W. J. DUNCAN 3,097,614

TABLE EXTENSION SLIDE MECHANISM

Filed April 26, 1962 3 Sheets-Sheet 2

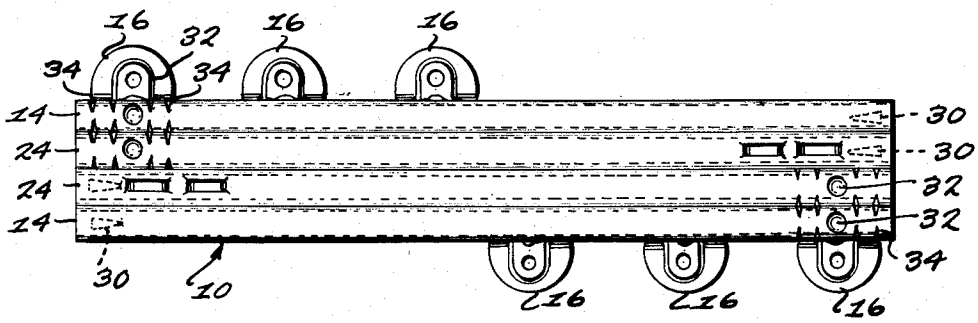


Fig. 8

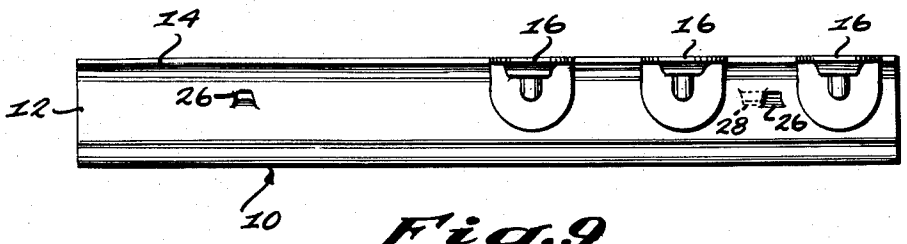


Fig. 9

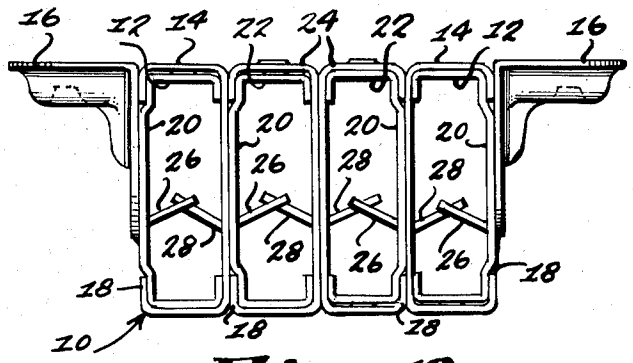


Fig. 10

INVENTOR.
WILLIAM J. DUNCAN
BY
Channing L. Richards
ATTORNEY

July 16, 1963 W. J. DUNCAN 3,097,614

TABLE EXTENSION SLIDE MECHANISM

Filed April 26, 1962 3 Sheets-Sheet 3

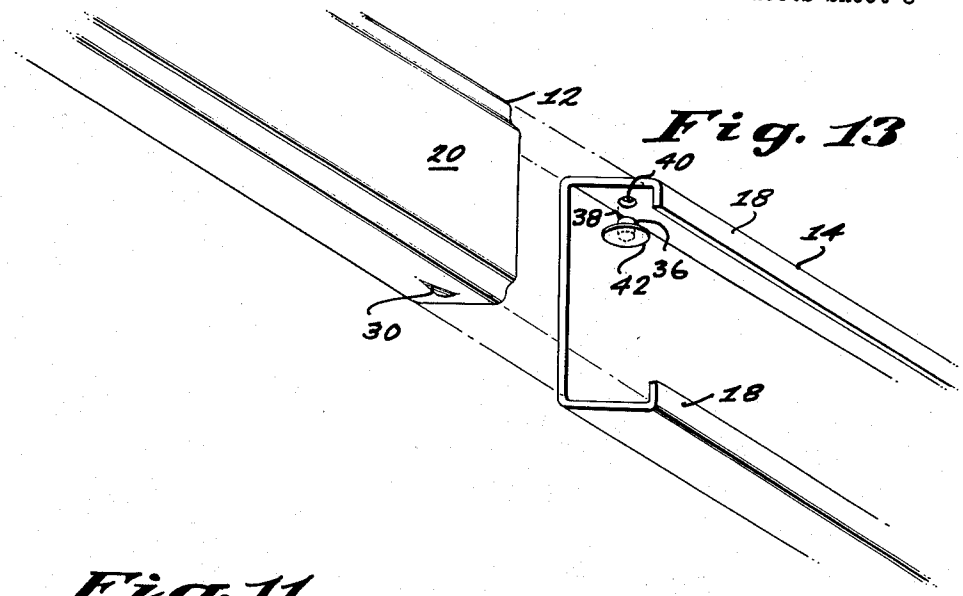
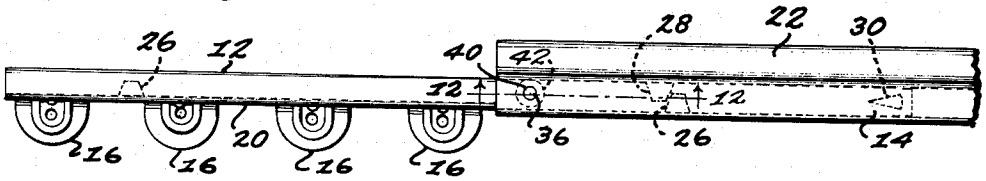


Fig. 13

Fig. 11



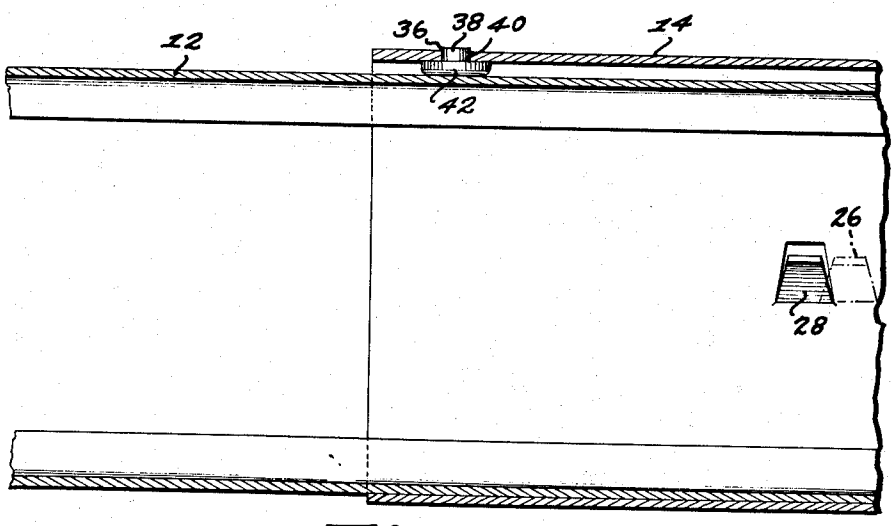


Fig. 12

INVENTOR.
WILLIAM J. DUNCAN
BY
Channing L. Richards
ATTORNEY

United States Patent Office 3,097,614 Patented July 16, 1963

3,097,614

TABLE EXTENSION SLIDE MECHANISM

William J. Duncan, Statesville, N.C., assignor to Acme Homes Metal Works, Inc., a corporation of North Carolina

Filed Apr. 26, 1962, Ser. No. 193,043
7 Claims. (Cl. 108—83)

This invention relates to extension slide mechanisms of the type provided for association with the primary leaves of a table to allow spacing of these primary leaves for accommodating intermediate extra leaves when desired. This is a continuation in part of my copending application Serial No. 100,326, filed April 3, 1961, and now abandoned.

Extension slide mechanisms of this sort are often formed of metal slide members arranged in telescopically assembled pairs of inner and outer slide members that are combined for cumulative extension to provide the spaced extent needed between the primary table leaves to receive the extra table leaves that are to be inserted. When extended for this purpose, the extension slide mechanisms—usually one adjacent each side of the table—must also serve to support the inserted extra leaves so that they are disposed to form a satisfactory composite table surface with the primary leaves; and this latter requirement has made it difficult to employ metal slide extension mechanisms effectively because the telescoping play or clearance necessary in the slide member pairs to allow a sufficiently free sliding action produces a sagging effect upon extension that in turn allows the extra table leaves to sag objectionably below the level of the primary leaves.

According to the present invention, this difficulty is overcome uniquely by providing an extension slide mechanism in which the inner slide members are arranged to assume an inclined disposition in relation to the outer slide members that is employed to compensate for the sagging tendency of the slide members upon extension, so that the supported position of the extra table leaves may be maintained nicely level with the primary leaves while avoiding any structural or operating complication in obtaining this result; all as described in further detail below in connection with the accompanying drawings, in which:

FIG. 1 is a plan view illustrating the arrangement of a composite table surface having primary and extra leaves therein that are positioned by extension slide mechanisms embodying the present invention;

FIG. 2 is a vertical section taken substantially on the line 2—2 in FIG. 1;

FIG. 3 is an enlarged side elevation of the right end portion of the extension slide mechanism shown in FIG. 2;

FIG. 4 is a plan view corresponding to FIG. 3;

FIG. 5 is a further enlarged fragmentary side elevation detail illustrating the manner in which the trailing end of each inner slide member is arranged to ride high;

FIG. 6 is a transverse sectional detail taken substantially on the line 6—6 in FIG. 4, but corresponding in scale to FIG. 5;

FIG. 7 is a further similar section detail taken substantially at the line 7—7 in FIG. 4;

FIG. 8 is a plan view of an extension slide mechanism embodying the present invention when fully retracted;

FIG. 9 is a side elevation corresponding to FIG. 8;

FIG. 10 is a right end view corresponding to FIG. 9;

FIG. 11 is a plan view of an extension slide mechanism incorporating a modified embodiment of the present invention;

FIG. 12 is an enlarged fragmentary sectional view taken substantially at the line 12—12 in FIG. 11; and

FIG. 13 is an exploded fragmentary perspective view of the elements of the extension slide mechanism of FIG. 11.

In FIG. 1 of the drawings, the relative position of extension slide mechanisms embodying the present invention (as indicated generally by the reference numeral 10) is illustrated in dotted lines as representatively employed to form a composite table surface including a pair of primary leaves P and intermediate extra leaves E.

The corresponding sectional illustration in FIG. 2 shows one of the extension slide mechanisms 10 in side elevation as comprising end pairs of telescopically assembled inner and outer slide members 12 and 14 (compare FIGS. 1 and 2). The inner slide members 12 of these end pairs are each fitted with mounting brackets 16, which may advantageously be of the form disclosed in U.S. Patent No. 2,766,959, for respective attachment at the under side of each of the primary table leaves P.

In general, the pairs of slide members 12 and 14 have a structural form comparable to that shown in the above noted U.S. Patent No. 2,766,959 and in U.S. Patent No. 2,676,858; these slide members being of generally rectangular shape in cross section, with each outer slide member 14 having one side thereof longitudinally slotted throughout its length (as between edge flange portions 18 such as are seen best in FIGS. 6, 7 and 10), and with each inner slide member 12 having a side portion thereof formed outwardly (as at 20 in FIGS. 6, 7 and 10) to a substantially (or at least) flush disposition between the outer slide member flanges 18 forming the longitudinal slot therein. The flush disposition of this outwardly formed side portion 20 of the inner slide members 12 allows the mounting brackets 16 to be secured readily thereat while clearing the outer slide members 14 during extension and retraction of the slide mechanism 10; and similarly facilitates the assembly of a plurality of slide member pairs for cumulative extension of the complete slide mechanism as described further below.

An extension slide mechanism 10 might be formed according to the present invention of only two pairs of inner and outer slide members 12 and 14, in which case the outer slide members 14 might alternatively be provided as a single integral unit such as is shown in the previously noted prior patents; but it will usually be desirable to employ a greater number of slide member pairs in the manner indicated by the illustrated embodiment of the invention, which incorporates four pairs.

To associate four slide member pairs in forming an extension slide mechanism 10 of the form illustrated, the outer slide member 14 of each end pair is secured in back to back relation with inner slide members 22 of centrally arranged pairs that in turn have the respective outer slide members 24 thereof secured in back to back relation, so that there are central and end slide member pairs joined in a symmetrically reversed relation from the center outward for cumulative sliding extension in both directions with respect to the center; the extent of sliding extension being determined by stop fingers struck inwardly from the sides of the inner and outer slide members as indicated at 26 and 28 in FIGS. 3 and 6.

As it is the inner slide members 12 of the end pairs that are attached (at the mounting brackets 16) to the primary table leaves P, the extension slide mechanisms 10 are extended by the pull resulting at these end slide members 12 as the primary leaves P are separated to provide the spacing for insertion of extra leaves E, and when fully extended the mechanisms 10 have the constituent slide members thereof telescopically projecting in paired relation to form what amounts to a beam supported at each end. Because of the inner slide members 12 and 22 must each be fitted with some play or clearance allowance for satisfactory telescopic sliding in the respec-

tive outer slide members 14 and 24 with which they are paired, the result is a sagging effect in the fully extended slide mechanisms 10 from each end toward the middle as previously mentioned, so that the support of the inserted extra table leaves E is not maintained level with the primary leaves P.

To obviate this result, the extension slide mechanism 10 of the present invention is specially formed so that each inner slide member 12 or 22 is disposed within its paired outer slide member 14 or 24 with a downward inclination in the direction of sliding movement therefrom. This downwardly inclined disposition is obtained by forming each inner slide member adjacent its trailing end to ride high within the paired outer slide member, as by a downwardly struck bottom surface boss such as is illustrated in FIGS. 3 to 6 at 30; and by additionally forming each outer slide member adjacent its respectively opposite end to maintain the leading portion of the paired inner slide member riding low thereat, as by a downwardly struck top surface boss such as is illustrated in FIGS. 4 and 6 at 32.

By virtue of this arrangement, the extension slide mechanisms 10 are caused to bow upwardly from each end toward the middle or center upon extension and thereby compensate for the sagging tendency of the telescoping slide members when extended. This upward bowing tendency may be visualized by recognizing that the mounting brackets 16 must be secured on the inner slide members 12 of the end pairs so as to allow for the downward inclination of these slide members 12 when the extension slide mechanisms are fully retracted as seen in FIGS. 8, 9 and 10. Accordingly, the end slide members 12 by which the slide mechanisms 10 are supported will be attached at the under sides of the respective primary leaves P with the inclined disposition determined by the previously mentioned bosses 30 and 32 in order to maintain the slide mechanisms 10 free for sliding extension despite this inclined disposition. As sliding extension takes place, however, the respective bosses 30 and 32 necessarily approach each other along the longitudinal axis of the slide mechanisms 10, and the result is an action toward eliminating any telescopic play between the paired slide members and causing each outer slide member to rise because of the inclined disposition of its paired inner slide member. In this manner a fully compensating action may be built into the slide mechanisms 10 so that any sagging tendency upon extension is entirely eliminated, and a perfectly level supported disposition of inserted extra leaves E may be obtained in relation to primary table leaves P.

The previously described arrangement of bosses 30 and 32 is employed respectively in all of the inner slide members 12 and 22 and outer slide members 14 and 24 (as indicated in FIG. 8) to provide the foregoing compensating action throughout the slide mechanisms 10; and it should be further noted that the provision of the bosses 32 in the outer slide members 14 and 24 to maintain the leading portions of the inner slide members 12 and 22 riding low therein, makes it possible to strengthen the ends of the outer slide members 14 and 24 from which extension takes place by the arrangement of transverse corner ribs 34 adjacent the bosses 32 at the side edges of the top surface of each outer slide member 14 or 24. Such corner ribs 34 strengthen the cross section of the outer slide members 14 and 24 to excellent advantage against the load they must bear when the slide mechanisms 10 are fully extended.

The present invention, as exemplified in the above described embodiment of FIGS. 1–10, may be employed in forming extension slide mechanisms of any desired length, although as the length is increased a greater sliding friction results between the outer and inner slide members which can be reduced advantageously by modifying the mechanism to substitute inserts of material having a low coefficient of friction, in place of the previously noted struck bosses, in a manner such as illustrated in the embodiment of FIGS. 11, 12 and 13.

The extension slide mechanism of FIGS. 11, 12 and 13 is generally similar to the mechanism of FIGS. 1–10 and corresponding elements are indicated by identical reference numerals. However, it should be noted that the inner slide member 12 of FIG. 11 is of greater lengthwise extent than the corresponding inner slide member 12 of FIGS. 3 and 4 and carries four mounting brackets 16 rather than the three shown in FIGS. 3 and 4.

In the embodiment of FIGS. 11, 12 and 13, a bearing insert 36 is used in place of the top boss 32 in the top surface of the outer slide member 14 for the same general purpose of disposing the inner slide member 12 within the outer slide member 14 at a downward inclination in the direction of sliding movement therefrom. This bearing insert 36 is located in the same location as the boss 32 and has a bearing portion 42 located between the inner and outer slide members 12 and 14 of a thickness sufficient to obtain the desired downward inclination of the inner slide member 12.

The bearing insert 36 is retained in position during relative sliding movement of the slide members by a seat portion 38 seated in an opening 40 in the top surface of the outer slide member 14. This seat portion 38 and opening 40 are of smaller diameter than the bearing portion 42 so that the bearing portion 42 cannot pass through the opening, and the seat portion 38 is of sufficient thickness to remain in the opening 40 during operation of the mechanism. Thus the insert 36 is retained in proper position without requiring any further means of retention.

In addition, the opening 40 in the outer slide member 14 is preferably of substantially the same diameter as the seat portion 38 of the bearing insert 36 so that during assembly of the elements the bearing insert 36 can be held in place in the outer slide member 14 preparatory to inserting the inner slide member 12, by a press fit of the seat portion 38 in the opening 40.

To obtain the desired ease of manipulation the bearing insert 36 may be formed of any suitable material having a relatively low coefficient of friction. For example, nylon and other plastics characterized by a degree of lubricity provide excellent results, although numerous other materials may be used to advantage.

It should be noted that in the embodiment of FIGS. 11, 12 and 13 the upward positioning of the trailing end of the inner slide member 12 in the outer slide member 14 is obtained using a downward struck boss 30 identical to that of the previously described embodiment of FIGS. 1–10, but it should be understood that a bearing insert of the type described above could also be substituted for this boss 30, if desired.

The present invention has been described in detail above for purposes of illustration only and is not intended to be limited by this description or otherwise except as defined in the appended claims.

I claim:

1. A table extension slide mechanism for association with primary table leaves to allow spacing thereof for accommodating at least one intermediate extra leaf, said mechanism comprising at least two inner slide members assembled in telescoping relation with an outer slide structure for sliding extension in opposite directions therefrom, said inner slide members being inclined downwardly with respect to said outer slide structure in the direction of their respective sliding extension, and said downward inclination being obtained by a first boss struck downwardly in the lower surface of each inner slide member adjacent its trailing end so as to cause said end to ride high within said outer slide structure and by second bosses struck downwardly in the top surface of said outer slide structure at the portions thereof from which said inner slide members are respectively extended so as to maintain the inner slide members riding low thereat.

2. A table extension slide mechanism comprising a plu-

rality of paired inner and outer slide members, each pair of inner and outer slide members being assembled in telescoping relation for relative sliding movement, and said plurality of paired slide members having respective members thereof attached to provide for cumulative sliding extension to space primary table leaves apart and support extra table leaves therebetween, the inner slide member of each pair having a first boss struck downwardly in its lower surface adjacent the trailing end thereof for riding high within the paired outer slide member, and each paired outer slide member having a second boss struck downwardly in its top surface adjacent its respectively opposite end for maintaining the leading portion of the inner slide member riding low therein, whereby cumulative extension of said paired slide members causes the resulting extended series of said slide members to bow upwardly from each end toward the middle and thereby support said extra table leaves level with said primary leaves by compensating for the sagging tendency of said slide members upon extension due to telescoping play.

3. A table extension slide mechanism as defined in claim 2 and further characterized in that each paired outer slide member is generally rectangular in cross section with one side thereof longitudinally slotted throughout its length, and each such slide member is additionally formed adjacent said second boss with transverse corner ribs at the side edges of said top surface.

4. A table extension slide mechanism for association with primary table leaves to allow spacing thereof for accommodating intermediate extra leaves, said slide mechanism comprising pairs of telescopically assembled inner and outer slide members that are of generally rectangular shape with each outer slide member having one side thereof longitudinally slotted throughout its length and with each inner slide member formed to present a longitudinal side portion thereof substantially flush at said longitudinal slot, first and second pairs of said inner and outer slide members having the respective outer slide members thereof secured in back to back relation for sliding extension of the respectively paired inner slide members in opposite directions therefrom, the inner slide members of said first and second pairs being secured at the flush side portions thereof in back to back relation with respective outer slide members of third and fourth slide member pairs for cumulatively increasing the reach of said sliding extension, the inner slide members of said third and fourth pairs having mounting brackets secured at the flush side thereof for respective attachment at the under side of said primary table leaves, and each inner slide member being disposed and maintained within its paired outer slide member with a downward inclination in the direction of said sliding extension by means of a first boss struck downwardly in the bottom surface of each inner slide member adjacent the trailing end thereof and a second boss struck downwardly in the top surface of each outer slide member adjacent the respectively opposite end thereof.

5. A table extension slide mechanism for association with primary table leaves to allow spacing thereof for accommodating at least one intermediate extra leaf, said mechanism comprising at least two inner slide members assembled in telescoping relation with an outer slide structure for sliding extension in opposite directions therefrom, said inner slide members being inclined downwardly with respect to said outer slide structure in the direction of their respective sliding extension, and said downward inclination being obtained by a first protuberance extending downwardly from the lower surface of each inner slide member adjacent its trailing end so as to cause said end to ride high within said outer slide structure and by second protuberances extending downwardly from the top surface of said outer slide structure at the portions thereof from which said inner slide members are respectively extended so as to maintain the inner slide members riding low thereat.

6. A table extension slide mechanism according to claim 5 and characterized further in that said second protuberances are in the form of bearing inserts mounted to the top surface of said outer slide structure and extending between said outer slide structure and the top surface of the inner slide members to provide a bearing surface for sliding contact with said inner slide members.

7. A table extension slide mechanism for association with primary table leaves to allow spacing thereof for accommodating at least one intermediate extra leaf, said mechanism comprising at least two inner slide members assembled in telescoping relation with an outer slide structure for sliding extension in opposite directions therefrom, said inner slide members being inclined downwardly with respect to said outer slide structure in the direction of their respective sliding extension, and said downward inclination being obtained by a first protuberance extending downwardly from the lower surface of each inner slide member adjacent its trailing end so as to cause said end to ride high within said outer slide structure and by bearing inserts seated in openings in the top surface of said outer slide structure at the portions thereof from which said inner slide members are respectively extended and having bearing portions of widthwise extent greater than said openings to prevent said inserts from passing through said openings, said bearing portions being between the top surface of said outer slide structure and the top surface of said inner slide members and being of sufficient thickness to maintain the inner slide members riding low thereat.

References Cited in the file of this patent

UNITED STATES PATENTS

949,119	Gruender	Feb. 15, 1910
2,626,195	Walter	Jan. 20, 1953
2,676,858	Duncan	Apr. 27, 1954
2,750,244	Manson et al.	June 12, 1956
2,751,269	Hafekost	June 19, 1956
2,766,959	Duncan	Oct. 16, 1956