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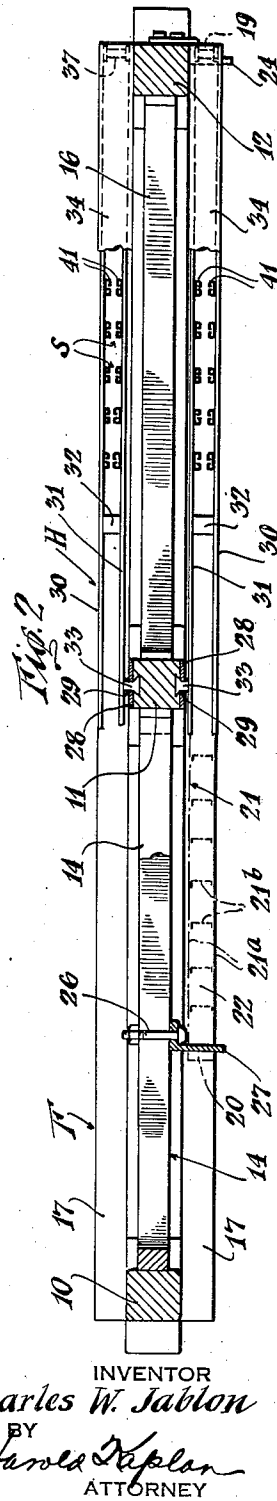
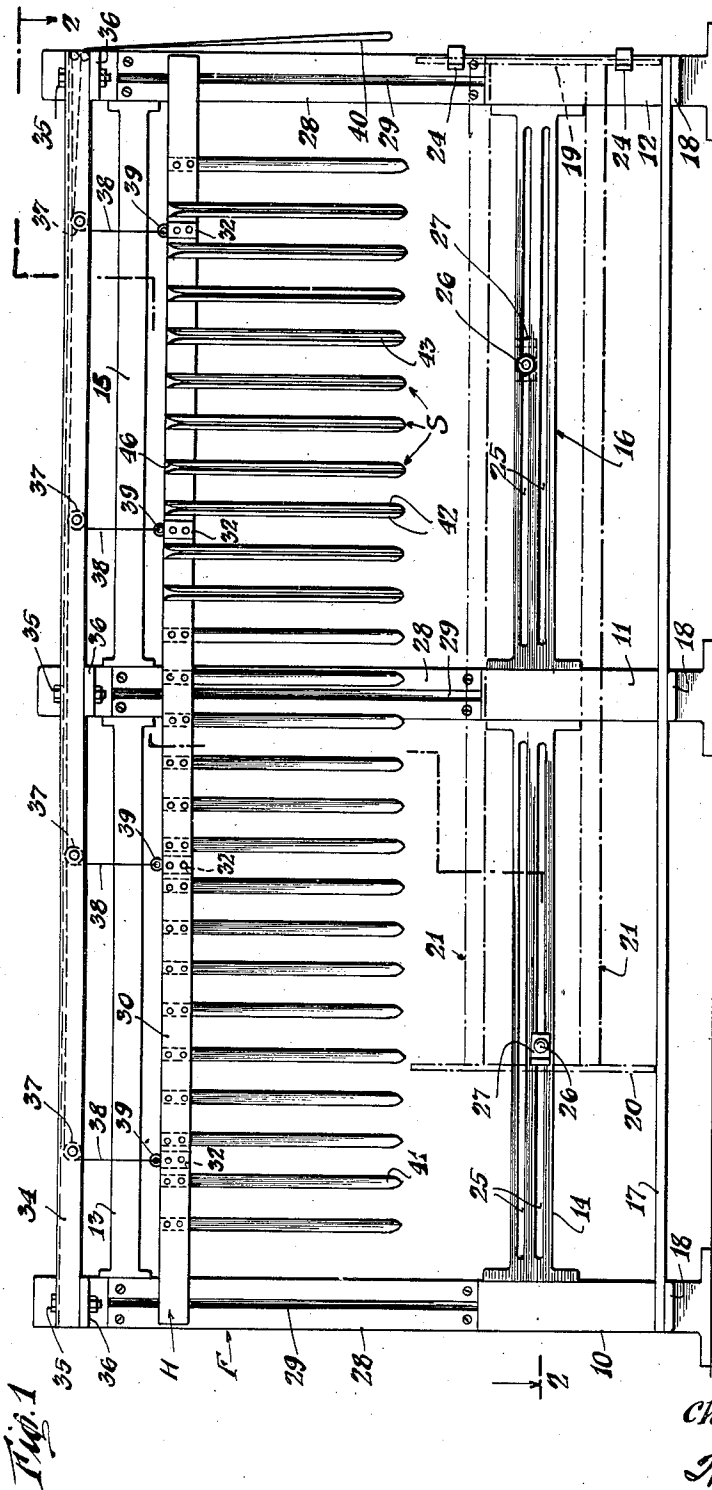
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APPARATUS FOR ASSEMBLING VENETIAN BLINDS

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2 Sheets-Sheet 1



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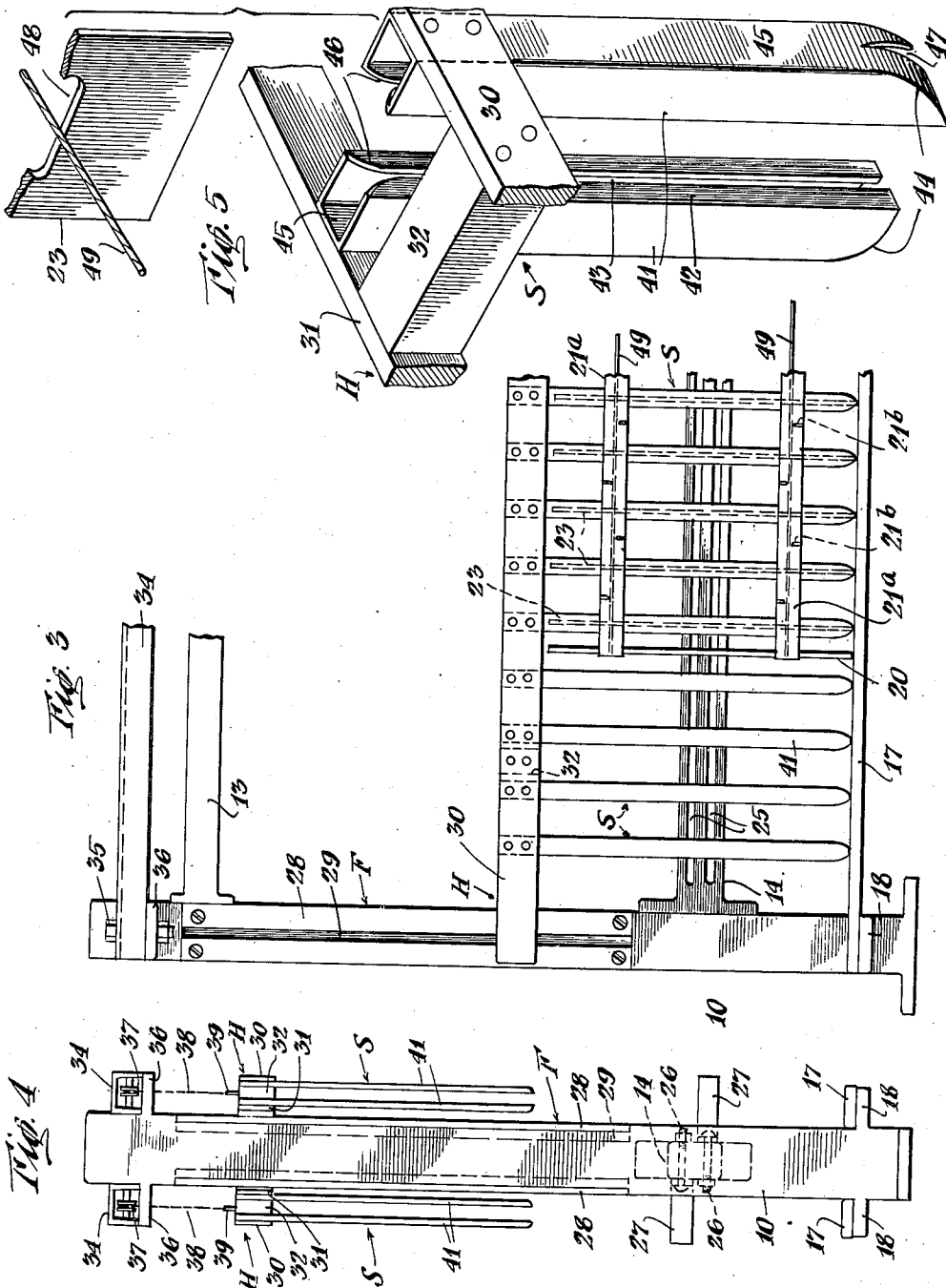
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2 Sheets-Sheet 2



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APPARATUS FOR ASSEMBLING VENETIAN
BLINDS

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7 Claims. (Cl. 29—84)

The present invention relates to the manufacture of Venetian blinds, and more particularly to an apparatus for use in assembling the component parts of such blinds.

The principal object of the present invention is to provide an apparatus which will facilitate the operation of assembling the component parts of Venetian blinds, so as to make it possible to accomplish rapid production of Venetian blinds in commercial quantities.

A particular feature of the invention is the provision of means for holding the ladder tapes of a Venetian blind structure in a convenient extended position so that the slat-receiving compartments, formed by the walls of the ladder tapes, are presented in open disposition for insertion of the slats. Another feature of the invention is the provision of devices designed to enter the compartments of the ladder tapes and adapted to spread the walls thereof, whereby to enable the slats to be easily inserted into the compartments. A further feature of the invention is the provision of a common carrier for said spreading devices and means for bringing the spreader devices into and out of the ladder tape compartments in unison.

A further feature of the invention is the provision as a part of said spreader devices of guiding means for directing the slats during their insertion into the compartments of the ladder tapes, and for holding the slats in spaced parallel disposition. Still another feature of the invention is the provision of limiting means for aligning the slats to permit the operator to thread the conventional operating cords for the blind through the usual apertures with which each slat is provided.

Other objects and advantages of the present invention will become apparent as the description of the selected physical embodiment of the invention herein disclosed progresses.

With the above and other objects in view the preferred physical embodiment of the present invention consists of the novel features of construction, combination of elements and arrangement of parts hereinafter described and illustrated in the accompanying drawings. It is to be understood, however, that the invention is not limited to the specific details of construction herein described and illustrated in the drawings, but that changes in construction are contemplated which will nevertheless come within the spirit and scope of the invention as defined in the appended claims.

In the accompanying drawings which form an integral part of this specification,

Fig. 1 is a view in side elevation of an apparatus constructed in accordance with the present invention, the spreader-guide devices being shown in a raised position;

Fig. 2 is a horizontal sectional view taken on the irregular line 2—2 of Fig. 1;

Fig. 3 is a fragmentary detail view on an enlarged scale, of the left hand portion of the apparatus shown in Fig. 1, the spreader-guide devices being shown in a lowered position;

Fig. 4 is a view in end elevation of the apparatus shown in Fig. 3, looking from left to right; and

Fig. 5 is a fragmentary detail view in perspective of one of the spreader-guide devices of the present invention, with associated parts of the carrier elements therefor.

Referring now in greater detail to the drawings which illustrate the preferred embodiment of the invention selected for illustration and description herein, wherein like reference characters indicate corresponding parts throughout the several views, F designates generally a supporting frame or structure having upright posts 10, 11 and 12, and horizontal cross-members 13, 14, 15 and 16. On each side of the supporting frame adjacent the lower portion thereof, there is preferably provided a shelf or platform 17 which extends longitudinally of the supporting frame and rests on supporting members 18 provided at the lower portions of the upright posts 10, 11 and 12. Each shelf or platform 17 is adapted for supporting thereon in horizontally extended position, a Venetian blind structure of the conventional type, a partial assembly of which is shown in dotted outline in Figs. 1 and 2.

The partially assembled blind structure with which the slats are to be assembled consists, as shown in Figs. 1 and 2, of an upper rail component 19, a lower rail component 20, and ladder tape components 21. Each of the ladder tape components comprises a pair of oppositely disposed longitudinal tapes 21a, the ends of which are connected in the usual manner to the upper and lower rail components 19 and 20, and a plurality of cross tapes 21b connecting the longitudinal tapes and forming therewith compartments or pockets 22 in which the slats 23 (see Fig. 5) are to be inserted.

In accordance with the principles of the present invention, the apparatus is provided with suitable means for holding the blind structure in horizontally extended position. For this purpose the outer upright post 12 is provided with a pair of vertically spaced flanges 24 for engaging the rail component 19 of the blind structure and holding it in a fixed position while the rail component 20 is moved horizontally by the operator to stretch out the connected ladder tapes 21 in a horizontal disposition so that the ladder tapes occupy the extended position shown in Fig. 1. The cross-members 14 and 16 of the supporting frame are each provided with longitudinal slots 25 through which is passed a bolt 26 that serves

when tightened to hold a traveling arm 27 in any desired adjusted position lengthwise of the corresponding cross-member. Each of these traveling arms 27 is designed to extend across the rail component 28 of the blind structure for holding it against the tension exerted by the extended ladder tapes 21.

On opposite sides of each of the upright posts 10, 11 and 12 is mounted a vertical guide plate 28 having a longitudinal slot 29. On each side of the supporting frame F there is mounted and fitted to slide vertically upon the guide plates 28, a cross-head H which comprises a pair of horizontally spaced bars 30 and 31, extending longitudinally of the frame, these bars being connected at appropriate intervals by spacing blocks 32. Each of the cross-heads H serves to carry up and down a series of depending spreader-guides S which will be described in greater detail hereinafter. In Fig. 2 is shown in horizontal sectional detail one of the sliding devices for the cross-head H, consisting of a set of headed studs 33 set into the cross-head and transfixing the slots 29 in the guide plates 28.

On each side of the supporting frame F adjacent the upper portion thereof, there is provided a beam 34 of channeled cross-section, which is mounted by means of suitable bolts 35 on supporting members 36 provided at the upper portion of each of the posts 10, 11 and 12. Each of the beams 34 extends longitudinally of the supporting frame and is provided interiorly at spaced intervals with direction pulleys 37, over which extend cables or cords 38. Each of the cables 38 has one end secured as at 39 to one of the blocks 32 of the cross-head H, and the other ends of the cables terminate in a common draw loop 40 operable manually at one end of the supporting frame F, for lowering and raising the cross-head H.

The spreader-guides S are carried by the cross-head H, each spreader-guide consisting of two elongated oppositely disposed, symmetrically arranged members 41, formed of rigid sheet material (see Fig. 5). The inner faces 42 of the spreader-guide members 41 are formed with slots 43 and the lower ends of the members 41 are beveled or tapered as at 44 to facilitate their entry into the compartments 22 formed by the walls of the ladder tapes 21. In Figs. 1 and 2, it will be observed that the spreader-guides S are arranged in spaced parallel relation and are disposed directly over the compartments formed by the walls of the ladder tapes. When the spreader guides S are lowered from the position shown in Fig. 1 to that shown in Fig. 3 by means of the manually operable draw loop 40, they are caused to enter the compartments of the ladder tapes and the outer walls 45 of the spreader-members 41 act to spread the walls of the compartments so as to enable the slats 23 to be easily inserted therein. In inserting the slats into the compartments of the ladder tapes, each slat is placed preferably by hand in its appropriate spreader guide, as indicated in Fig. 5, by moving the slat down into the slots 43, thus bridging the gap between the spreader-guide members 41. The upper portions of the inner faces 42 of the spreader-guide members are preferably cut away as at 46 to provide a mouth for ready reception of the slat to be inserted, and the lower tapered ends 44 of the spreader-guide members are slotted as at 47 to permit passage of the slat through the spreader-guide.

The slats 23 are each provided with spaced transverse apertures 48, shown in Fig. 5, through which are to extend the operating cords for the completed Venetian blind structure. When the slats are placed in their appropriate spreader-guides, they drop to the platform 17 and are held, by cooperation of the platform 17 and the spreader-guides, in upright spaced parallel alignment, to permit threading of the operating cords 49 for the blind through the aligned apertures 48. The spreader-guide members 41, being spaced apart, as shown in Fig. 2, not only afford a continuous space, parallel with the longitudinal tapes 21a of the ladder tapes, for passage of the cords 49 in the threading operation, but actually serve as guides for such threading. The threading operation is performed with a suitable instrument in the nature of a needle to which the cord is connected by passing same through the apertures of the slats and the end rails.

The threading of the operating cords through the apertures of the slats and the end rails completes the operation of assembling the component parts of the blind, and the spreader-guides S may then be raised out of the compartments of the ladder tapes by pulling on the draw loop 40. The assembled blind structure is then dismounted from the apparatus, and the apparatus is ready for the assembling operation of another blind.

It will be apparent that the apparatus embodies duplex sets of instrumentalities for the purpose of accomplishing the assembling operation so that two operators may be employed at the same time on opposite sides of the apparatus.

Having thus described and illustrated my invention, what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for assembling the components of a ladder tape Venetian blind structure, comprising in combination, means for holding the ladder tapes of a blind in extended position with its slat-receiving compartments in open disposition, a series of elongated guide members in spaced relation corresponding to the spacing of the compartments and insertable therein, means for holding the guide members in said spaced relation and for the insertion of same as a unit into the compartments of the ladder tapes, each guide member having guiding parts adapting same for receiving a slat to freely guide it into its respective compartment, and means for engaging the inserted slats and for retaining same in alignment to permit threading of the operating cords for the blind through the thus aligned apertures of the slats.

2. An apparatus for assembling the components of a ladder tape Venetian blind structure, comprising in combination, means for holding the ladder tapes of a blind in extended position with its slat-receiving compartments in open disposition, a series of elongated spreader-guides in spaced relation corresponding to the spacing of the compartments and insertable therein, means for holding the spreader-guides in said spaced relation and for the insertion of same as a unit into the compartments of the ladder tapes, said spreader-guides each having a conformation at their leading ends adapted to spread the walls of said compartments and having guiding parts adapting each spreader-guide for receiving a slat to freely guide it into its respective compartment, and means for engaging the inserted slats and for retaining same in alignment to permit threading of the operating cords for the blind through the thus aligned apertures of the slats.

3. An apparatus for assembling the components of a ladder tape Venetian blind structure, comprising in combination, means for holding the ladder tapes of a blind in horizontally extended position with its slat-receiving compartments in open upright disposition, a series of elongated spreader-guides in spaced relation corresponding to the spacing of the compartments and insertable vertically therein, means for holding said spreader-guides in said spaced relation and for the insertion of same as a unit into the compartments of the ladder tapes, said spreader-guides each having a conformation at their leading ends adapted to spread the walls of said compartments and having longitudinal slots adapting each spreader-guide for receiving a slat to freely guide it into its respective compartment, and a platform for engaging the inserted slats and for supporting same in upright alignment to permit threading of the operating cords for the blind through the thus aligned apertures of the slats.

4. An apparatus for assembling the components of a ladder tape Venetian blind structure, comprising in combination, means for holding the ladder tapes of a blind in horizontally extended position with its slat-receiving compartments in open upright disposition, a series of elongated spreader-guides in spaced relation corresponding to the spacing of the compartments and insertable vertically therein, means for holding said spreader-guides in said spaced relation and for the insertion of same as a unit into the compartments of the ladder tapes, said spreader-guides each having a conformation at their leading ends adapted to spread the walls of said compartments and having longitudinal slots adapting each spreader-guide for receiving a slat to freely guide it into its respective compartment, a platform for engaging the inserted slats and for supporting same in upright alignment to permit threading of the operating cords for the blind through the thus aligned apertures of the slats, said holding means for the spreader-guides being mounted for reciprocatory vertical movement relative to the ladder tapes, and manually actuated means for reciprocating said holding means whereby to bring the spreader-guides into and out of the compartments of the ladder tapes.

5. An apparatus for assembling the components of a ladder tape Venetian blind structure, comprising in combination, an upright frame, means on the frame for holding the ladder tapes of a blind in horizontally extended position with its slat receiving compartments in open upright disposition, a series of elongated spreader-guides in spaced relation corresponding to the spacing of the compartments and insertable vertically therein, means for holding said spreader-guides in said spaced relation and for the insertion of same as a unit into the compartments of the ladder tapes, said spreader-guides each having a conformation at their leading ends adapted to spread the walls of said compartments and having longitudinal slots adapting each spreader-guide for receiving a slat to freely guide it into its respective compartment, a platform for engaging the inserted slats and for supporting same in upright alignment to permit threading of the oper-

ating cords for the blind through the thus aligned apertures of the slats, said holding means for the spreader-guides being mounted on the frame for reciprocatory vertical movement relative to the ladder tapes and manually actuated means for reciprocating said holding means whereby to bring the spreader-guides into and out of the compartments of the ladder tapes, said actuating means including a set of cables secured to said holding means and guided over pulleys on the frame to a common manually operable draw member.

6. An apparatus for assembling the components of a ladder tape Venetian blind structure comprising in combination, an upright frame, a platform on a side of the frame upon which the upper and lower rail components of a blind may be supported on end, means on the frame for holding said rail components in spaced relation with the connected ladder tapes extended in horizontal position presenting its slat-receiving compartments in open upright disposition, a cross-head mounted on said side of the frame for reciprocatory vertical movement relative to said ladder tapes, said cross-head having a series of elongated spreader-guides insertable vertically into the compartments of the ladder tape depending therefrom in spaced relation corresponding to the spacing of the compartments, and manually actuated means for reciprocating said cross-head whereby to bring said spreader-guides into and out of the compartments in unison, said spreader-guides each having a conformation at their leading ends adapted to spread the walls of said compartments and having longitudinal slots adapting each spreader-guide for receiving a slat to freely guide it into its respective compartment, said platform also serving to engage the inserted slats and to support same in upright alignment with said rail components to permit threading of the operating cords for the blind through the thus aligned apertures of the slats and rail components.

7. A mechanism for use in assembling the components of a ladder tape Venetian blind structure, said mechanism including means for spreading the compartments of the ladder tapes of a blind, for guiding the insertion of slats into said compartments, and for guiding the threading of the operating cords of the blind through the apertures of the slats, comprising a series of spreader-guides in spaced relation corresponding to the spacing of the compartments and insertable therein, and means for holding the spreader-guides in said spaced relation and for the insertion of same as a unit into the compartments, each spreader-guide comprising a pair of spaced elongated members having a conformation at their leading ends adapted to spread the walls of one of the compartments, said elongated members having opposed faces with longitudinal slots arranged in symmetrical disposition adapting the spreader-guide for receiving a slat to freely guide it into its respective compartment, the spaces between said elongated members being arranged in alignment to form a continuous guide for threading the operating cords of the blind through the apertures of the slats.

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