Oct. 17, 1961 E. D. HANSON 3,004,334

DEVICE FOR HOLDING AND SEPARATING A PLURALITY OF APERTURED PLATES HAVING WIRE TERMINALS IN THE APERTURES THEREOF

Filed Aug. 7, 1958 6 Sheets-Sheet 1

FIG. 1.

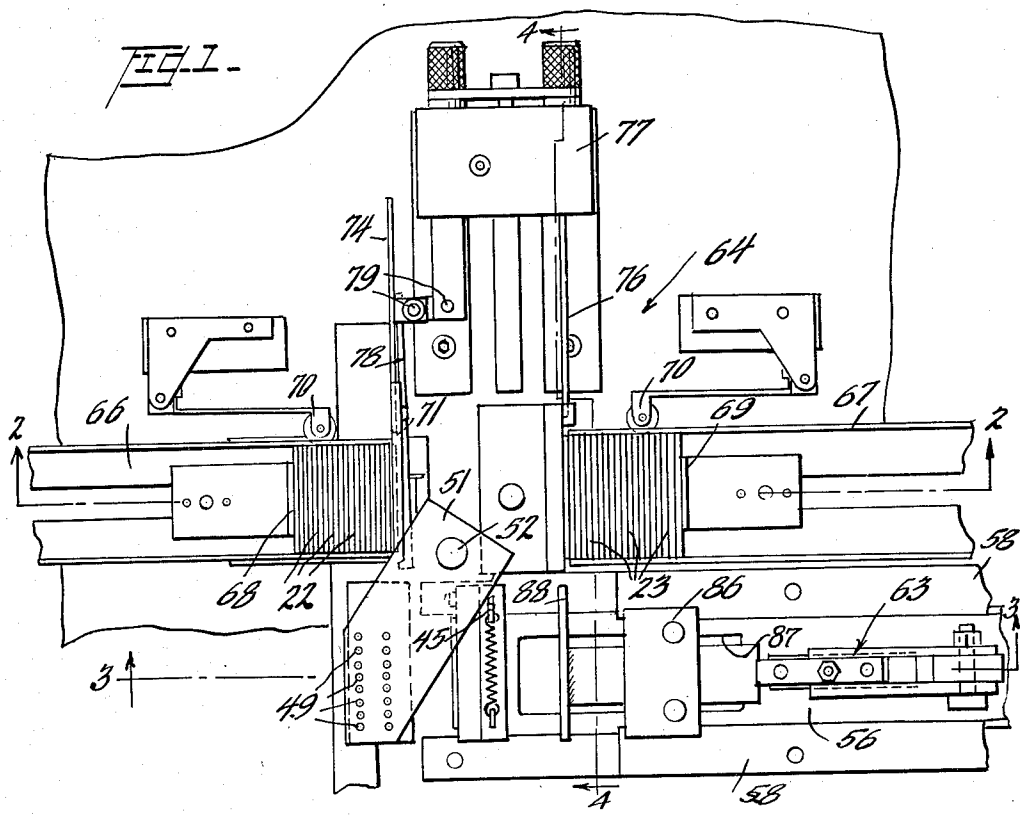
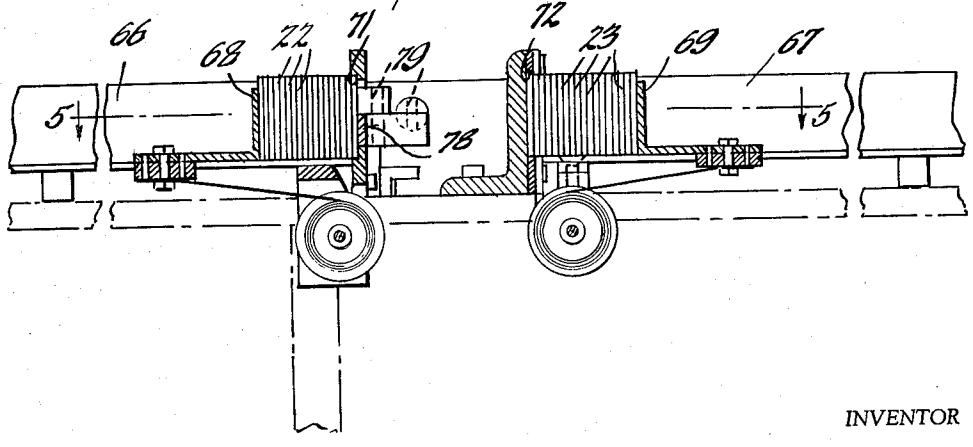


FIG. 2.



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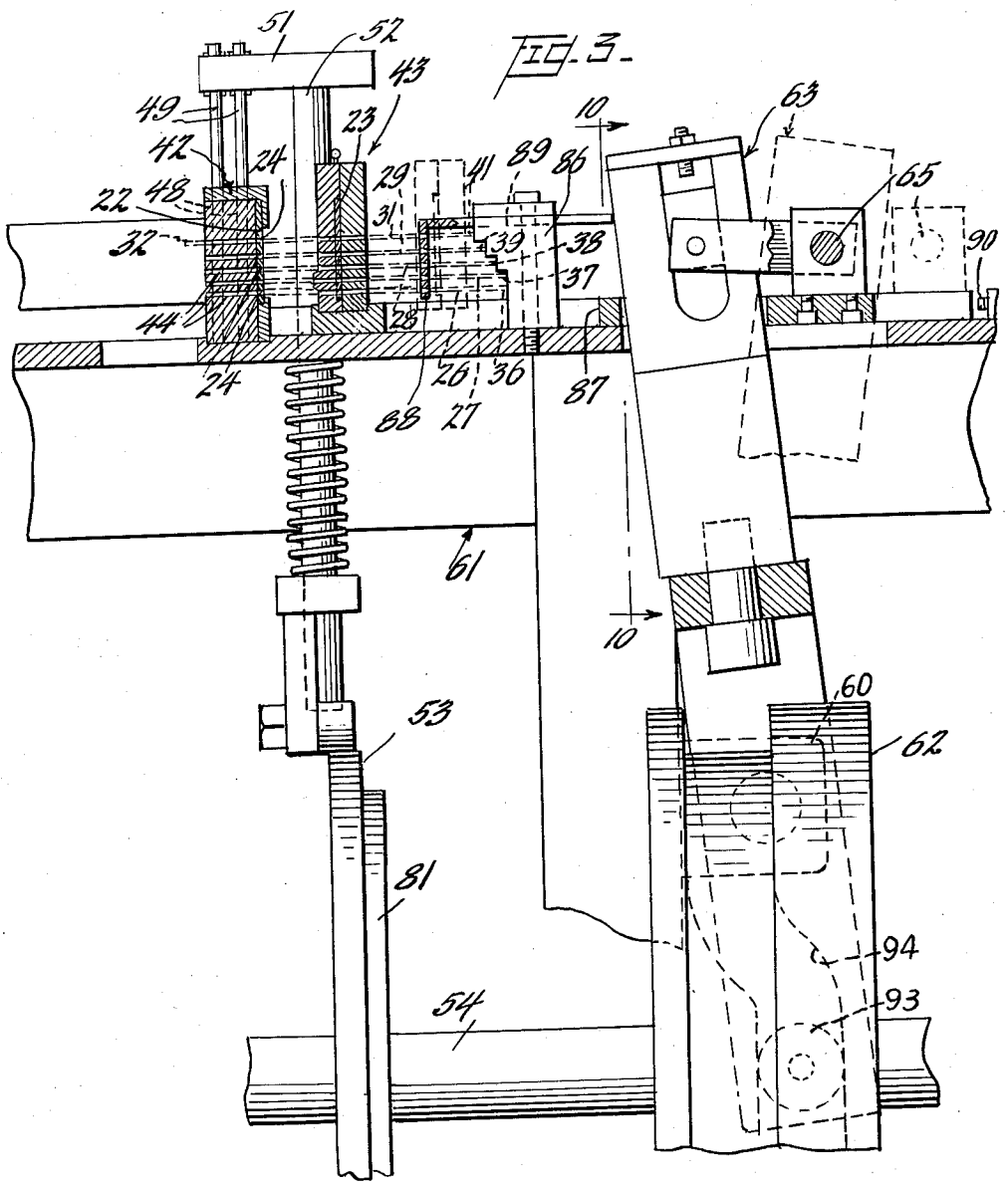
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FIG. 5.



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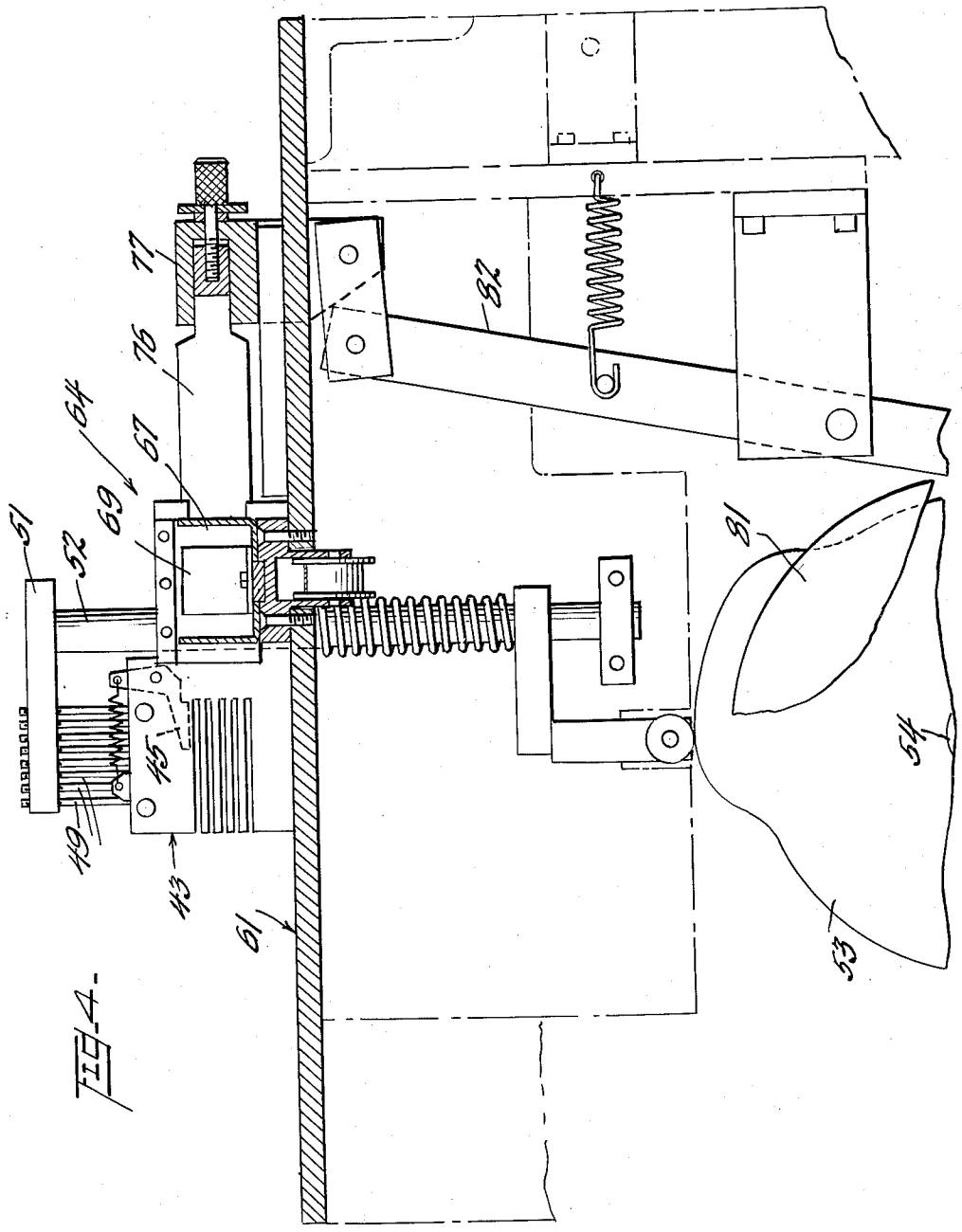


FIG. 4.

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DEVICE FOR HOLDING AND SEPARATING A PLURALITY OF APERTURED PLATES HAVING WIRE TERMINALS IN THE APERTURES THEREOF

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FIG. 5

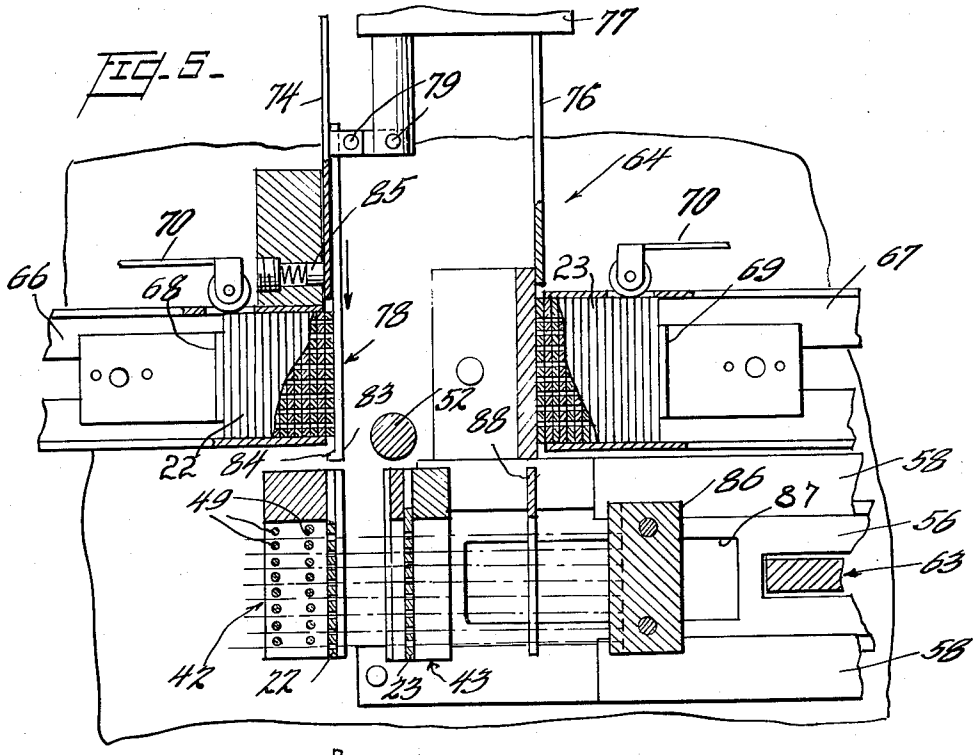
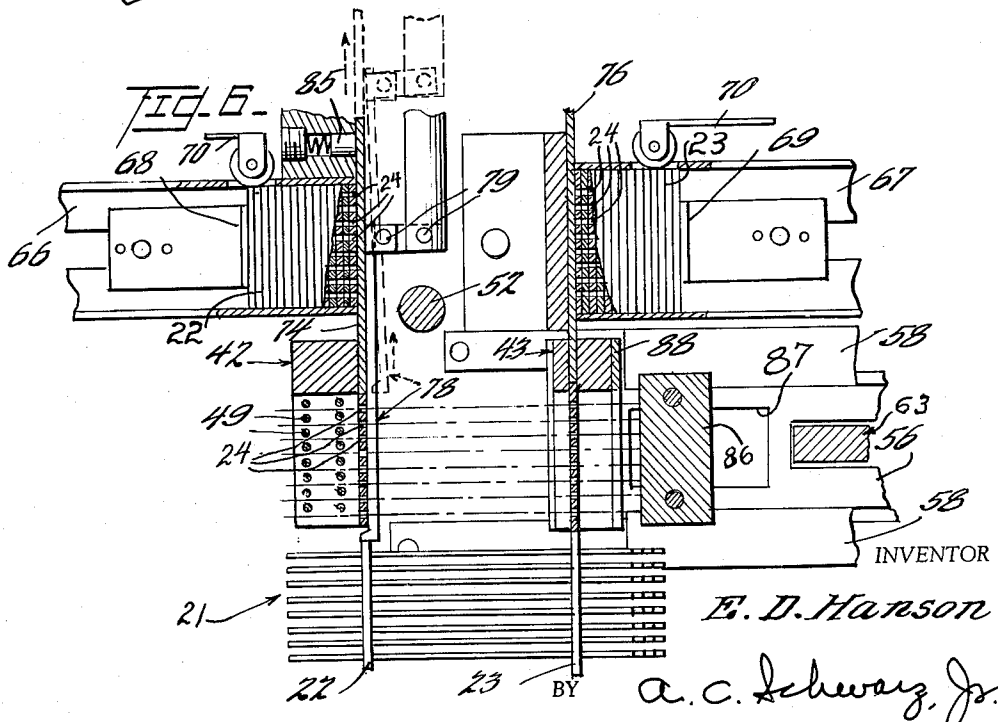


FIG. 6



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DEVICE FOR HOLDING AND SEPARATING A PLURALITY OF APERTURED PLATES HAVING WIRE TERMINALS IN THE APERTURES THEREOF

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FIG. 7.

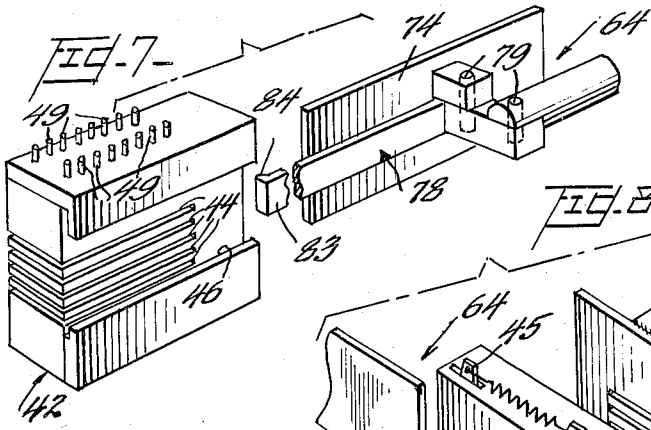


FIG. 8.

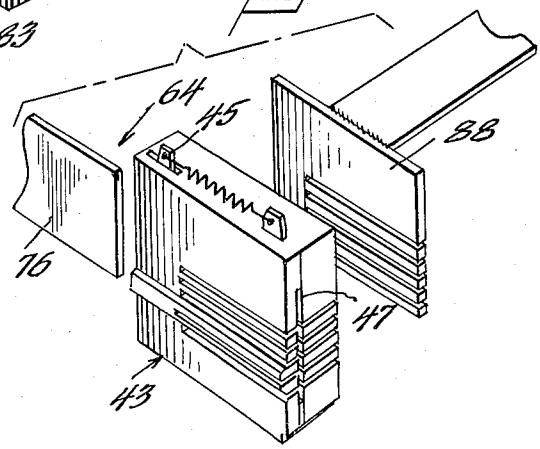


FIG. 10.

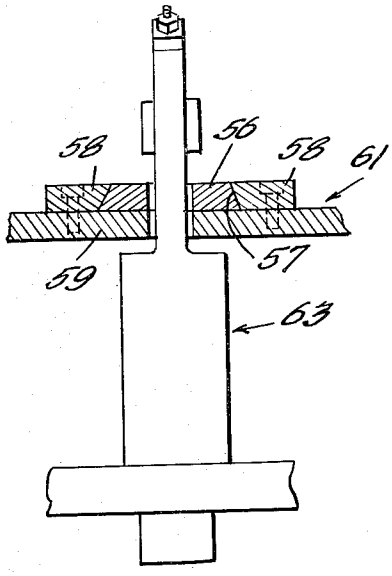
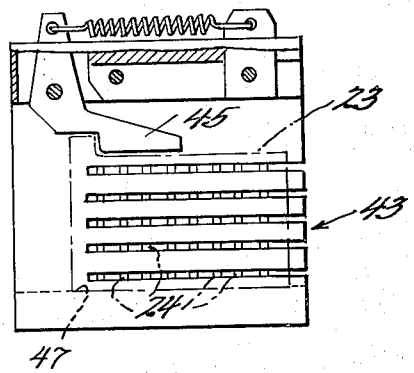


FIG. 9.



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DEVICE FOR HOLDING AND SEPARATING A PLURALITY OF APERTURED PLATES HAVING WIRE TERMINALS IN THE APERTURES THEREOF

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FIG. 11.

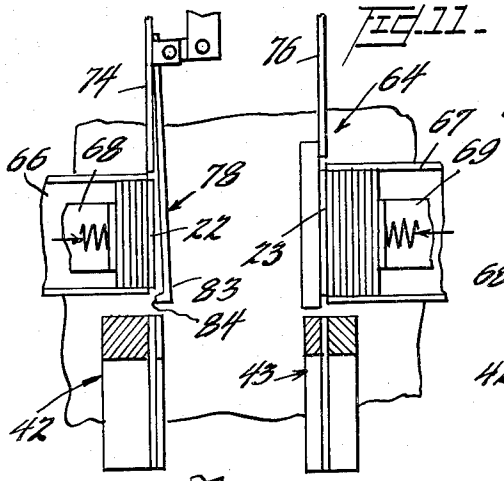


FIG. 12.

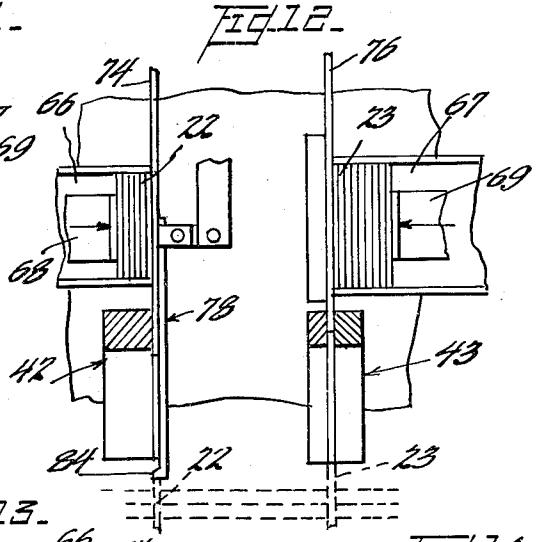


FIG. 13.

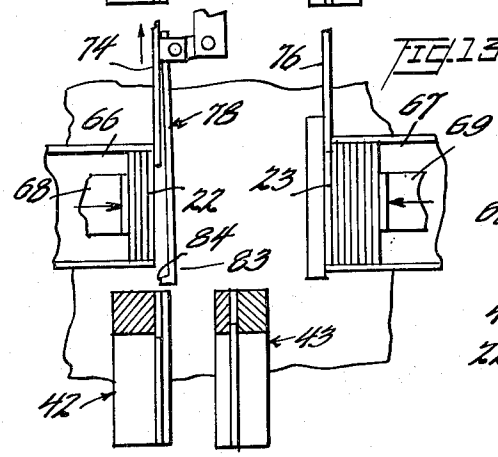


FIG. 14.

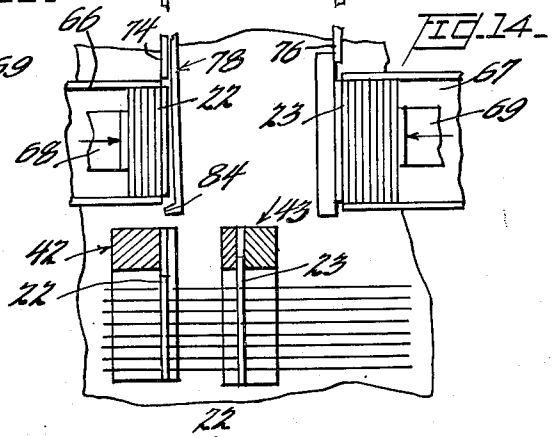


FIG. 15.

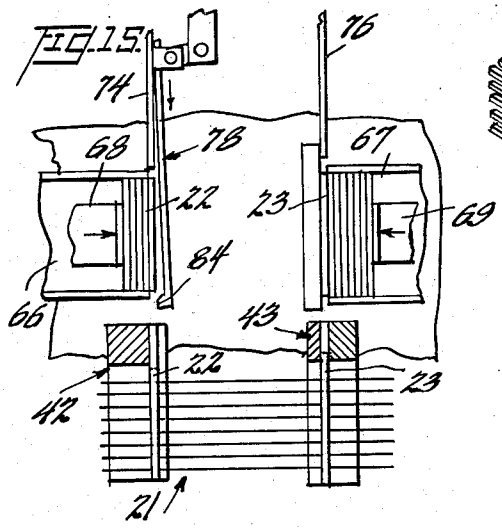
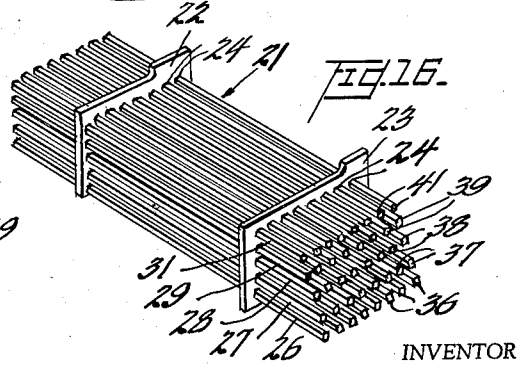


FIG. 16.



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United States Patent Office 3,004,334 Patented Oct. 17, 1961

3,004,334

DEVICE FOR HOLDING AND SEPARATING A PLURALITY OF APERTURED PLATES HAVING WIRE TERMINALS IN THE APERTURES THEREOF

Estyle D. Hanson, Baltimore, Md., assignor to Western Electric Company, Incorporated, New York, N.Y., a corporation of New York

Filed Aug. 7, 1958, Ser. No. 753,795
6 Claims. (Cl. 29—203)

This invention relates to devices for holding and separating a plurality of apertured plates having wire terminals in the apertures thereof, and more particularly, although not exclusively, to devices for holding a plurality of apertured end plates during the formation of cage-like terminal strip subassemblies and separating the end plates to lock a plurality of wire terminals in the apertures thereof.

The device may be utilized in apparatus, similar to that disclosed and claimed in application Serial No. 753,724, filed on August 7, 1958, in the name of L. J. Moeller, utilized in the formation of cage-like subassemblies of cast resin terminal assemblies.

The subassemblies may be utilized in the formation of cast resin terminal strip assemblies which are utilized in the communications industry to facilitate the wiring of relay racks or other telephone apparatus requiring a multiplicity of circuit connections. The cast resin terminal assemblies are formed by casting plastic in all of the space between the end plates or a cage-like subassembly.

The completed cage-like subassembly includes a pair of generally rectangular, similarly shaped end or retaining plates formed from a stiff plastic material. Each of the plates in one type of subassembly is provided with five rows of eight axially spaced apertures. The apertures are square in cross section, and are designed to receive a plurality of elongated, rod-like terminals made up of square, hard drawn, brass wire, or the like, which is capable of being twisted axially and retaining a twisted set. The terminals are twisted prior to their insertion into the apertures of the end plates, and the end plates are separated to retain the terminals therein by resulting torques set up as a result of the axial pretwist in the terminals.

An object of the present invention is to provide improved end-plate holding and separating devices.

Another object of the present invention is to provide a device for holding a plurality of apertured end plates in close proximity to each other with the apertures therein aligned for the insertion of pretwisted, rod-like terminals, and separating the plates longitudinally of the terminals for locking the terminals and end plates together to form a cage-like terminal strip subassembly.

A further object of the present invention is to provide an automatically operated end-plate feeding, holding, separating and ejecting device, wherein the end plates are fed into the end-plate holders, axially pretwisted terminals are fed into the aligned apertures in the end plates, the end plates are separated while maintaining the terminals in predetermined fixed positions to lock the terminals and end plates together to form a cast resin terminal strip subassembly by the torques set up as a result of the axial pretwist of the terminals, and the subassembly is ejected from the device.

In attaining these and other objects, a device embodying certain aspects of the present invention may include means for holding the end plates adjacent to each other with the apertures thereof in aligned relationship, means for feeding the end plates into the end-plate holding means, means for supplying pretwisted wire terminals,

means for feeding the wire terminals longitudinally of the axes thereof into the aligned apertures of the end plates and therethrough predetermined distances, means for separating the end plates to lock the terminals and the end plates together and form a cage-like terminal strip subassembly, means for maintaining the terminals in predetermined positions during the separation of the end plates, and means for ejecting a subassembly from the device.

Other objects and features of the present invention may be more readily understood from the following detailed description of the preferred embodiment thereof when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a fragmentary, top plan view of a device embodying certain aspects of the present invention;

FIG. 2 is a fragmentary, cross-sectional view of a portion of the apparatus of FIG. 1, taken along line 2—2 thereof;

FIG. 3 is a fragmentary, cross-sectional view of the apparatus of FIG. 1, taken along line 3—3 thereof;

FIG. 4 is an enlarged, fragmentary, cross-sectional view of the apparatus of FIG. 1, taken along line 4—4 thereof;

FIG. 5 is an enlarged, fragmentary, cross-sectional view of the apparatus of FIG. 2 taken along line 5—5 thereof;

FIG. 6 is a view of a portion of the apparatus of FIG. 5 in a different operating position;

FIG. 7 is a fragmentary, exploded view of a portion of the apparatus of FIG. 1;

FIG. 8 is a fragmentary, exploded view of a portion of the apparatus of FIG. 1, which combined with FIG. 7 forms a substantial portion of the end-plate feeding, holding, and ejecting device;

FIG. 9 is a view of a portion of the movable end-plate holder of FIG. 8 with portions thereof removed for purposes of clarity;

FIG. 10 is a fragmentary, cross-sectional view of the apparatus of FIG. 3 taken along line 10—10 thereof;

FIGS. 11 to 15, inclusive, illustrate schematically various successive operating positions of the feeding and ejecting portions and holding and separating portions of the device of FIG. 1; and

FIG. 16 illustrates a completed cage-like terminal strip subassembly.

Referring now to the drawings, and more particularly to FIG. 16 thereof, a finished terminal block subassembly, indicated generally by the numeral 21, includes two spaced, parallel, plastic end plates 22 and 23, each provided with a plurality of noncircular apertures 24—24 therein which are arranged in five rows each containing eight apertures. The end plates 22 and 23 are of slightly different dimensions but the positions of the apertures 24—24 in the end plate 22 correspond exactly with the positions of the apertures 24—24 formed in the end plate 23. The apertures 24—24 are designed to receive a plurality of noncircular terminals 26—26, 27—27, 28—28, 29—29 and 31—31, which are cut to predetermined lengths from indefinite lengths of eight supply wires 32—32 (FIG. 3) after the supply wires 32—32 have been inserted into the aligned apertures 24—24 in the end plates 22 and 23.

Prior to the assembly of the end plates 22 and 23 and the terminals 26—26, 27—27, 28—28, 29—29 and 31—31 to form the subassemblies 21, the supply wires 32—32, from which the terminals are formed, are provided individually with predetermined axial pretwist sets. The adjacent terminals 26—26, 27—27, 28—28, 29—29 and 31—31 in each row are given opposite-hand axial pretwist sets of the same magnitude. During the assembly of the end plates 22 and 23 and terminals to form the subassembly, the end plates are held in close prox-

imity with respect to each other and aligned with their corresponding apertures 24—24 in mating relationship.

The leading ends 36—36 of the portion of the eight supply wires 32—32 which form the respective row of terminals 26—26 are fed simultaneously a predetermined distance through the corresponding aligned apertures 24—24. The supply wires 32—32 are then severed by suitable cutting means (not shown), such as is disclosed and claimed in my copending application, Serial No. 753,683, filed on August 7, 1958, to form the row of terminals 26—26 of predetermined lengths. The new leading ends 37—37 of the supply wires 32—32 are indexed to the second row of apertures 24—24 in the end plates 22 and 23, and the feeding and cutting operation is repeated to form the second row of terminals 27—27 and new leading ends 38—38 in a similar manner. The indexing and cutting operation is then repeated to form the third, fourth and fifth rows of terminals 28—28, 29—29 and 31—31, respectively, and new leading ends 39—39, 41—41 and 36—36 in a similar manner.

After the five rows of terminals 26—26, 27—27, 28—28, 29—29 and 31—31 have been inserted into the five rows of apertures 24—24, the end plates 22 and 23 are separated a predetermined distance whereby the rows of terminals and the plates are locked together by the resultant torque set up as a result of the opposite axial pretwist sets placed in the supply wires 32—32 prior to their insertion into the apertures.

Referring now to the remaining figures of the drawings, there is shown a device for initially holding the plastic end plates 22 and 23 closely together with the apertures 24—24 in mating alignment and for subsequently separating the end plates 22 and 23 to form a finished cast resin terminal block subassembly 21.

The device includes a stationary end-plate holder, designated generally by the numeral 42, and a movable end-plate holder, designated generally by the numeral 43. The stationary end-plate holder 42 is provided with five spaced parallel slots 44—44. The slots 44—44 are open at the left-hand ends thereof, as viewed in FIGS. 4 and 7, and are designed for receiving the five spaced rows of terminals 26—26, 27—27, 28—28, 29—29 and 31—31 of the subassembly 21. For this purpose the slots 44—44 are aligned accurately with corresponding rows of apertures 24—24 of the plastic end plates 22 and 23, which are received within suitable retaining channels 46 and 47 formed in the end-plate holders 42 and 43, respectively. A spring-biased, pivotable, retaining member 45 is provided to project into the channel 47 of the end-plate holder 43 to limit the movement of the end plate 23 as it is inserted therein.

The stationary end-plate holder 42 is provided also with two rows of eight equally spaced vertical bores 48—48 (FIG. 3) formed therein, into which two rows of eight guide pins 49—49 are received slidably. The guide pins 49—49 are secured adjacent to the upper ends to a laterally extending bracket 51 designed to be moved vertically by means of a push rod 52. A suitably shaped cam 53, driven rotatably by a camshaft 54, reciprocates the push rod 52 in a timed relationship with respect to the operation of the other elements of the device.

The bracket 51 is moved vertically between a raised position, as illustrated in FIGS. 3 and 4, wherein the guide pins 49—49 are substantially withdrawn from the bores 48—48 and a lower position wherein the pins 49—49 extend completely into the bores 48—48 and cooperate with the slots 44—44 to guide the leading ends 36—36, 37—37, 38—38, 39—39 and 41—41 of the feed wires 32—32 into the apertures 24—24 of the end plates 22 and 23 positioned in the retaining channels 46 and 47 in the respective end-plate holders 42 and 43.

The movable end-plate holder 43 is mounted on a slidable member 56 received within a dovetail slot 57 (FIG. 10) formed by the cooperation of two elongated guide members 58—58 and a portion 59 of a frame, designated generally by the numeral 61, of the device. The movable end-plate holder 43 may be moved longitudinally of the slot 57 between a terminal-loading position, as illustrated in solid lines in FIGS. 1, 3 and 5, wherein the movable end-plate holder 43 is adjacent to the stationary end-plate holder 42, and a terminal-locking position, as illustrated in FIG. 6, wherein the end plates 22 and 23 are separated a desired predetermined distance, as in the finished subassembly 21.

The reciprocation of the movable end-plate holder 43 is accomplished by means of a camshaft 54 which rotates a drum-type cam 62 which, in turn, operates a linkage, designated generally by the numeral 63, connected slidably to a cam follower 93 in a groove 94 therein, pivotably at an intermediate portion to a depending portion 60 of the frame 61, and pivotably adjustable by an eccentric pin 65 at the opposite end to the slidable member 56 and thus to the movable end-plate holder 43.

In its retracted position, the movable end-plate holder 43 is positioned for receiving the plastic end plate 23 from a feeding and ejecting mechanism, designated generally by the numeral 64. The feeding and ejecting mechanism 64 includes a pair of magazines 66 and 67 for storing the two different types of plastic end plates 22—22 and 23—23 used in making the terminal strip subassembly 21. The plastic end plates 22—22 and 23—23 in the respective magazines 66 and 67 are urged toward each other by spring-biased plates 68 and 69, respectively. The plastic end plates 22 and 23 are fed one at a time into guide tracks 71 and 72 associated with the magazines 66 and 67, respectively. The magazines 66 and 67 are provided with spring-biased switch-actuating means 70—70 connected to an appropriate electrical circuit (not shown) to notify the operator that the supply of end plates 22 and/or 23 is nearly depleted.

The feeding and ejecting mechanism 64 is designed to push a pair of end plates 22 and 23 from their respective magazines 66 and 67 into the retaining channels 46 and 47 provided in the stationary end-plate holder 42 and movable end-plate holder 43, respectively. The feeding and ejecting mechanism 64 includes two pusher members 74 and 76 attached adjustably to a slide member 77 and a pusher member, designated generally by the numeral 78, which along with the pusher member 74 is attached pivotally and adjustably to the slide member 77 by means of pins 79—79.

When the feeding and ejecting mechanism 64 is in its retracted position preparatory to a feeding and ejecting operation, as shown in FIG. 11, the pusher members 74 and 76 are in abutting contact with the rear edge of the end plates 22 and 23, respectively, in the magazines 66 and 67, respectively, and the free end of the pivotable pusher member 78 is positioned to the right of the end plate 23 positioned in the stationary end-plate holder 42, as viewed in FIGS. 11 to 15 inclusive. When the feeding and ejecting mechanism 64 is moved initially by means of the camshaft 54, a cam 81 and a suitable linkage 82 (FIG. 4), the free end 83 of the pivotable pusher member 78 moves to the left, as viewed in FIGS. 11 to 15, inclusive, so that the projecting portion 84 thereof moves between the plate 22 in the end-plate holder 42 and the end plate 22 in the magazine 66. Upon further movement of the feeding and ejecting mechanism 64 by means of the cam 81 and linkage 82, the pusher member 76 forces the end plate 23 from the magazine 67 against the end plate 23 in the movable end-plate holder 43. Simultaneously therewith, the pusher member 74 and pivotable member 78 push the end plates 22—22 positioned in the magazine 66 and in the stationary end-plate holder 42, respectively, to eject a formed subassembly 21 and feed subsequent plates 22 and 23 into the stationary and movable end-plate holders 42 and 43, respectively, in preparation for the assembly of a new subassembly 21. When the feeding and ejecting mechanism 64 is returned to its

retracted position, the free end 83 of the pivotable pusher member 78 moves to the right, as viewed in FIGS. 11 to 15, inclusive, to free it from the end plate 22 positioned in the stationary end-plate holder 42. The free end 83 of the pusher member 78 is caused to pivot as a result of a spring-biased friction member 85 (FIG. 5) applying force to the pusher member 74, which is mounted pivotally to and eccentrically with respect to the slide member 77.

A stepped abutting member 86 is positioned in a slot 87 in the slidable member 56 and mounted fixedly in the dovetailed slot 57 and to the portion 59 of the frame 61 which cooperates with the elongated guide members 58—58 to form the dovetailed slot 57. The stop member 86 is utilized to provide a positive stop for the leading ends 36—36, 37—37, 38—38, 39—39 and 41—41 of the supply wires 32—32 after they have been fed predetermined distances through the apertures 24—24 in the end plates 22 and 23.

A slotted guide 88 is provided intermediate the movable end-plate holder 43 and the abutting member 86 to guide the supply wires 32—32 extending therebetween. The guide 88 is mounted sliadably in a slot 89 in the upper portion of the stepped abutting member 86. The guide 88 is moved into its normal position, as shown in FIGS. 1, 3 and 5, by the linkage 63, operated by the cam 62, abutting and pushing it to the left as viewed in FIGS. 1, 3 and 5, during the positioning of the end-plate holder 43 adjacent to the holder 42 in preparation for the insertion of the supply wires 32—32 into the end plates 22 and 23. The guide 88 is moved into the position shown in FIG. 6 by the movable end-plate holder 43 during the separation of end plates 22 and 23 in the finished subassembly 21.

Operation

At the beginning of the operation in which the terminal block subassembly 21 is formed, the camshaft 54, through which the sequence of operation of the apparatus is controlled, is rotated and the slide member 56 is in its retracted position. The end-plate holder 43, mounted on the slide member 56, is positioned with its retaining channel 47 aligned for receiving an end plate 23 fed from the magazine 67 by the feeding and ejecting mechanism 64.

The feeding and ejecting mechanism 64 is then operated to insert the plastic end plates 22 and 23 into the retaining channels 46 and 47 of the stationary and movable end plate holders 42 and 43, respectively. The cam 62 operates the slide member 56 to move the movable end-plate holder 43 to its operative position immediately adjacent to the stationary end-plate holder 42, and subsequently the cam 53 operates to permit the guide pins 49—49 to descend in the corresponding bores 48—48 in the stationary end-plate holder 42.

The supply wires 32—32 are then inserted into the lowermost row of the apertures 24—24 in the end plates 22 and 23 by appropriate means (not shown). The supply wires 32—32 are then cut to predetermined lengths to form a bottom row of eight terminals 36—36. The new leading ends 37—37 of the supply wires 32—32 are then indexed to the second row of apertures 24—24, and the second, third, fourth and fifth rows of terminals 27—27, 28—28, 29—29 and 31—31 are formed in a similar manner by inserting the feed wires 32—32 into the rows of apertures 24—24 and cutting them to predetermined lengths.

When all of the terminals 26—26, 27—27, 28—28, 29—29 and 31—31 have been inserted into the apertures 24, the cam 62 moves the movable end plate holder 43 to its retracted position, thereby separating the end plates 22 and 23 and locking the terminals therein by the resultant torque set up as a result of twisting the supply wires 32—32 in opposite directions. The limit of travel of the movable end-plate holder 43 is controlled by an adjustable stop member 90 (FIG. 3).

The cam 53 then moves the push rod 52 to retract the guide pins 49—49 substantially from the bores 48—48 in the stationary end plate holder 42, and the finished subassembly 21 is then free to be removed from the end-plate holders 42 and 43, to the left as viewed in FIG. 4. The completed terminal block subassembly 21 is ejected from the end-plate holders 42 and 43 by the feeding and ejecting mechanism 64 when subsequent end plates 22 and 23 are fed into place in the retaining channels 46 and 47 in the end-plate holders 42 and 43 by the feeding and ejecting mechanism 64. During the ejection of the subassembly 21, the spring-biased stop retaining member 45 is caused to pivot upwardly to permit the removal of the end plate 23 from the channel 47.

It is to be understood that the above-described arrangements are simply illustrative of the invention. Other arrangements may be devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A device for holding a plurality of apertured end plates to facilitate longitudinal insertion of a plurality of elongated, pretwisted, noncircular terminals into complementary apertures of the end plates and for positioning the end plates relative to the terminals to form a cage-like terminal strip subassembly, which device comprises a pair of end-plate holders, at least one of which is mounted for movement with respect to the other between a terminal-loading position wherein the end-plate holders are in close proximity and a terminal-locking position wherein the end-plate holders are separated widely, each of said end-plate holders having an end-plate receiving channel extending therethrough for holding an apertured end plate with the apertures thereof in an aligned relationship with the apertures in another end plate held in the other of said end-plate holders to facilitate the longitudinal insertion of terminals into the aligned apertures while the end-plate holders are in the terminal-loading position, means for successively feeding the end plates into one end of each of the channels of said end-plate holders and for ejecting the end plates with the terminals therein from the opposite ends of the channels of said end-plate holders, means for moving at least one of said end-plate holders relative to the other from the terminal-loading position to the terminal-locking position so that the end plates are separated longitudinally of the inserted terminals to a predetermined spacing to form a terminal strip subassembly, and means for maintaining the terminals at predetermined longitudinal positions relative to one another during the separation of the end plates, said end-plate holders also having open-ended passages to permit the terminals to be inserted longitudinally into the aligned apertures of the end plates and to permit lateral movement of the terminals through the end-plate holders when the completed terminal strip subassembly is subsequently ejected from the device.

2. A device for holding a plurality of apertured end plates to facilitate longitudinal insertion of a plurality of elongated, pretwisted, noncircular terminals into complementary apertures of the end plates and positioning the end plates relative to the terminals to form a cage-like terminal strip subassembly, which device comprises a pair of end-plate holders, at least one of which is mounted for movement with respect to the other between a terminal-loading position wherein the end-plate holders are in close proximity and a terminal-locking position wherein the end-plate holders are separated widely, each of said end-plate holders having an end-plate receiving channel extending therethrough for holding an apertured end plate with the apertures thereof in an aligned relationship with the apertures in another end plate held in the other of said end-plate holders to facilitate the longitudinal in-

sertion of terminals into the aligned apertures while the end-plate holders are in the terminal-loading position, means for successively feeding the end plates into one end of each of the channels of said end-plate holders and for ejecting the end plates with the terminals therein from the opposite ends of the channels of said end-plate holders, means for moving at least one of said end-plate holders relative to the other from the terminal-loading position to the terminal-locking position so that the end plates are separated longitudinally of the inserted terminals to a predetermined spacing to form a terminal strip subassembly, means for maintaining the terminals at predetermined longitudinal positions relative to one another during the separation of the end plates, said end-plate holders also having open-ended slots to permit the terminals to be inserted longitudinally into the aligned apertures of the end plates and to permit lateral movement of the terminals through the end-plate holders when the completed terminal strip subassembly is ejected from the device, a plurality of spaced, movable guide pins extending transversely with respect to said slots, said guide pins cooperating with the slots in said one end-plate holder for forming a plurality of rectangular guide passages facilitating the insertion of the terminals into the apertures of the end plates held in said end-plate holders, and means for moving the guide pins in timed relationship with respect to feeding and ejecting means to permit lateral movement of the terminals through the open ends of the slots during the ejection of the completed terminal strip subassembly from the device.

3. A device for holding a plurality of apertured end plates to facilitate longitudinal insertion of a plurality of elongated, pretwisted, noncircular terminals into complementary apertures of the end plates and positioning the end plates relative to the terminals to form a cage-like terminal strip subassembly, which device comprises a pair of end-plate holders, at least one of which is mounted for movement with respect to the other between a terminal-loading position wherein the end-plate holders are in close proximity and a terminal-locking position wherein the end-plate holders are separated widely, each of said end-plate holders having an end-plate receiving channel extending therethrough for holding an apertured end plate with the apertures thereof in an aligned relationship with the apertures in another end plate held in the other of said end-plate holders to facilitate the longitudinal insertion of terminals into the aligned apertures while the end-plate holders are in the terminal-loading position, means for successively feeding the end plates into one end of each of the channels of said end-plate holders and for ejecting the end plates with the terminals therein from the opposite ends of the channels of said end-plate holders, means for moving at least one of said end-plate holders relative to the other from the terminal-loading position to the terminal-locking position so that the end plates are separated longitudinally of the inserted terminals to a predetermined spacing to form a terminal strip subassembly, means for maintaining the terminals at predetermined longitudinal positions relative to one another during the separation of the end plates, said end-plate holders also having open-ended horizontal slots to permit the terminals to be inserted longitudinally into the aligned apertures of the end plates and to permit lateral movement of the terminals through the end-plate holders when the completed terminal strip subassembly is subsequently ejected from the device, one of said end-plate holders having a plurality of vertical bores arranged transversely through said slots, a plurality of spaced guide pins positioned reciprocably in said bores, said guide pins cooperating with the slots in said one end-plate holder for forming a plurality of rectangular guide passages for facilitating the insertion of the terminals into the apertures of the end plates held in said end-plate holders, and means for moving the guide pins in timed relationship with respect to feeding and ejecting means to permit lateral movement of the terminals through the open ends of the slots during the ejection of the completed terminal strip subassembly from the device.

4. In apparatus for assembling a pair of end plates having noncircular apertures therein with a plurality of pretwisted, elongated terminals made of stiff but resilient material and of noncircular cross section designed for close reception within corresponding apertures in the end plates, said apparatus including means for feeding a plurality of terminals longitudinally, the improved device for holding the end plates to facilitate longitudinal insertion of terminals into corresponding apertures in the end plates and for positioning the end plates relative to the terminals to form a cage-like terminal strip subassembly, which device comprises a pair of end-plate holders, at least one of which is mounted for movement with respect to the other between a terminal-loading position wherein the end-plate holders are in close proximity and a terminal-locking position wherein the end-plate holders are separated widely, each of said end plate holders having an end-plate receiving channel extending therethrough for holding an apertured end plate with the apertures thereof in an aligned relationship with the apertures in another end plate held in the other of said end-plate holders to facilitate the longitudinal insertion of terminals into the aligned apertures while the end-plate holders are in the terminal-loading position, magazine means for storing a plurality of end plates, means cooperating with the magazine means for urging the end plates into paths aligned with the channels in the end-plate holders, means for successively feeding the end plates along said paths into one end of each of the channels of said end-plate holders and for ejecting the end plates with the terminals therein from the opposite ends of the channels of said holders, means for moving at least one of said end-plate holders relative to the other from the terminal-loading position to the terminal-locking position so that the end plates are separated longitudinally of the inserted terminals to a predetermined spacing to form a terminal strip subassembly, and means for maintaining the terminals at predetermined longitudinal positions relative to one another during the separation of the end plates, said end-plate holders also having open-ended passages to permit the terminals to be inserted longitudinally into the aligned apertures of the end plates and to permit lateral movement of the terminals through the end-plate holders when the completed terminal strip subassembly is subsequently ejected from the device.

5. A device as defined by claim 4 in which the feeding and ejecting means comprises a pivotable ejecting member having a laterally projecting end-plate engaging portion at the free end thereof, a slidable feeding member connected pivotably to said ejecting member, means connected to said ejecting member to impart reciprocable movement thereto and to the feeding member, and means for resisting sliding movement of the feeding member, said feeding member, said resisting means and said movement imparting means cooperating in such a manner as to cause pivotable movement of the ejecting member to move the end-plate engaging portion thereof into a first position aligned with the path of an end plate for ejection of the end plates out of the associated end-plate holder as the feeding member is moved in a feeding direction and into a second position removed from the path of travel of the end plates as the feeding member is moved in an opposite direction.

6. A device for holding a plurality of apertured end plates to facilitate longitudinal insertion of a plurality of elongated, pretwisted, noncircular terminals into complementary apertures of the end plates and positioning the end plates relative to the terminals to form a cage-like terminal strip subassembly, which device comprises a pair of end-plate holders, at least one of which is mounted for movement with respect to the other between a terminal-loading position wherein the end-plate

holders are in close proximity and a terminal-locking position wherein the end-plate holders are separated widely, each of said end-plate holders having an end-plate receiving channel extending therethrough for holding an apertured end plate with the apertures thereof in an aligned relationship with the apertures in another end plate held in the other of said end-plate holders to facilitate the longitudinal insertion of terminals into the aligned apertures while the end-plate holders are in the terminal-loading position, magazine means for storing a plurality of end plates, means cooperating with the magazine means for urging end plates into alignment with the channels in the end-plate holders, means for successively feeding the end plates into one end of each of the channels of said end-plate holders and for ejecting the end plates with the terminals therein from the opposite ends of the channels of said end-plate holders, retaining means for limiting the movement of the end plates during insertion of the end plates into the channels of the end-plate holders, means for moving at least one of said end-plate holders relative to the other from the terminal-loading position to the terminal-locking position so that the end plates are separated longitudinally of the inserted terminals to a predetermined spacing to form a terminal strip subassembly, means for maintaining the terminals at predetermined longitudinal positions relative to one another during the separation of the end plates, a movable guide for supporting portions of the terminals intermediate of one of the said end-plate holders and said terminal position maintaining means, said movable guide and said end-plate holders also having horizontal open-ended parallel slots arranged in aligned relationship to each other and to apertures in the end plates to permit the terminals to be inserted longitudinally into the aligned apertures of the end plates and to permit lateral movement of the terminals through the end-plate holders when the completed terminal strip subassembly is subsequently ejected from the device, a plurality of spaced guide pins positioned extending transversely to said slots in one of said end-plate holders, said guide pins cooperating with the slots in said one end-plate holder for forming a plurality of rectangular guide passages facilitating the insertion of the terminals into the apertures of the end plates held in said end-plate holders, and means for moving the guide pins in timed relationship with respect to feeding and ejecting means to permit lateral movement of the terminals through the open ends of the slots during the ejection of the completed terminal strip subassembly from the device.

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