

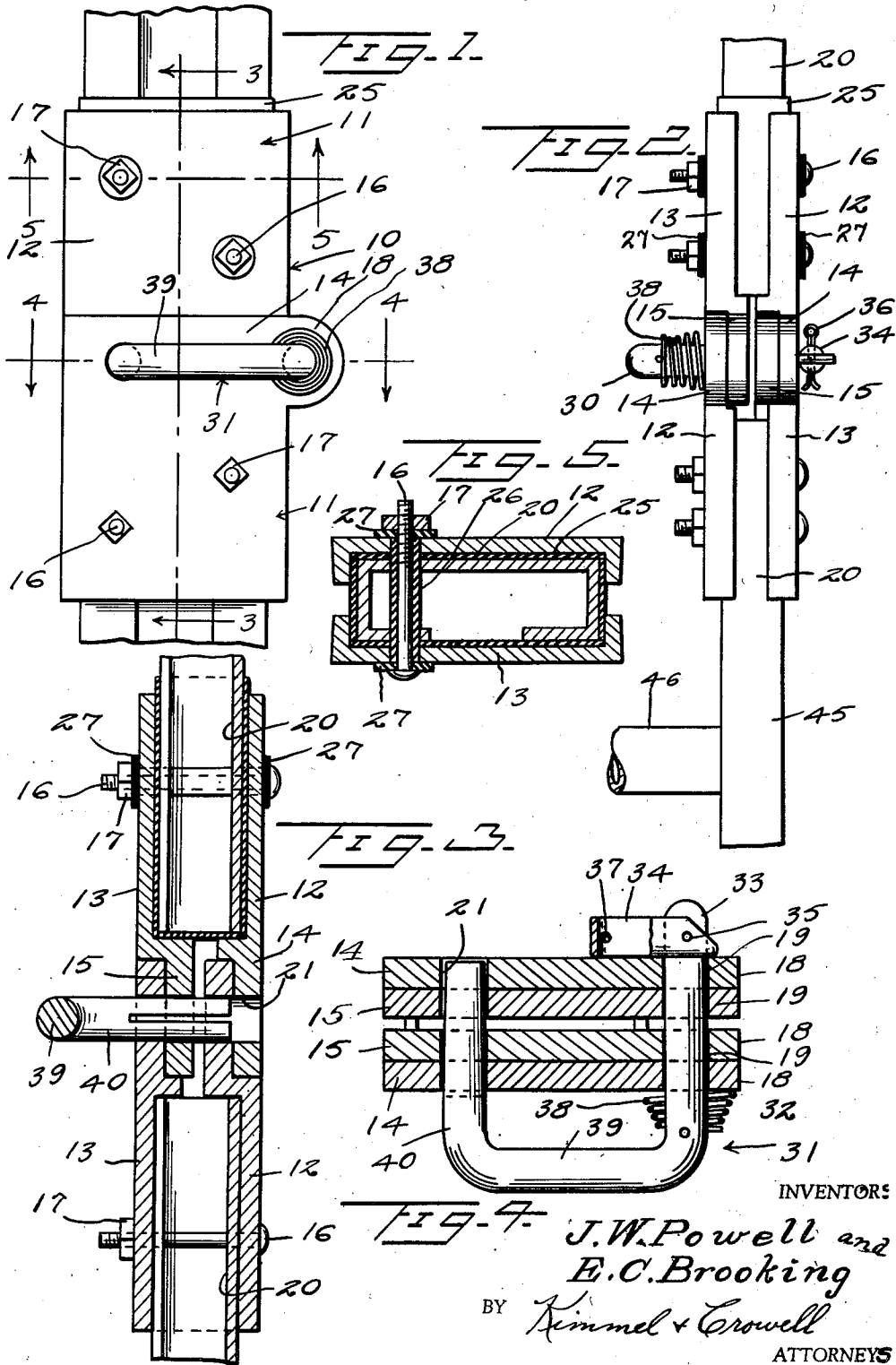
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HINGE CONSTRUCTION

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HINGE CONSTRUCTION

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This invention relates to a hinge construction and is particularly applicable in connection with a hinge construction for folding metal ladders, or similar devices.

A primary object of this invention is the provision of an improved and simplified hinge construction which may be locked in fixed position in such manner as to preclude the possibility of accidental disengagement, but which may be readily disengaged for folding of the ladder when desired.

An additional object of the invention is the provision of a hinge construction particularly adapted for the use of all-metal ladders, which is provided with insulating means whereby one section of the ladder may be insulated from another section, in order that the ladder may be used in conjunction with electrical apparatus without the possibility of grounding a circuit through the ladder structure.

A still further object of the invention is the provision of a hinge construction of this character including two oppositely disposed hinge plate assemblies which may be interchangeable, if desired.

Still other objects will in part be obvious, and in part be pointed out as the description of the invention proceeds, and shown in the accompanying drawing wherein there is disclosed a preferred embodiment of this inventive concept.

In the drawing:

Figure 1 is a side elevational view of one form of hinge construction embodying features of the instant invention.

Figure 2 is an end elevational view of the construction of Figure 1 as viewed from the right.

Figure 3 is an enlarged sectional view taken substantially along the line 3—3 of Figure 1, as viewed in the direction indicated by the arrows.

Figure 4 is an enlarged sectional view taken substantially along the line 4—4 of Figure 1, as viewed in the direction indicated by the arrows.

Figure 5 is an enlarged sectional view taken substantially along the line 5—5 of Figure 1, as viewed in the direction indicated by the arrows.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring now to the drawing in detail, the hinge construction of the instant invention, generally indicated at 10, is comprised of two identical but oppositely disposed hinge assemblies each generally indicated at 11.

Each hinge assembly consists of a pair of opposed clamping plates 12 and 13, each of channel shape, and each provided with a pair of spaced offset flanges 14 and 15 respectively, the channel portions of the plates 12 and 13 being oppositely disposed, but the off-set portions being off-set in the same direction, in order to coact with the corresponding flanges of the opposite hinge unit 11.

The plates 12 and 13 are provided with aligned bores, through which extend bolts 16 secured in position as by nuts 17, and each off-set portion 14 and 15 is provided with a projection 18, through which extend bores 19, the bores of each projection being adapted for transverse alignment when the hinge assemblies are juxtaposed.

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A channel shaped member 20 is adapted to be clampingly engaged within each pair of plates 12 and 13, and includes bores for the accommodation of bolts 16. A second set of bores 21 is provided in each flange 14 and 15, the bores 21 being adapted to register when the hinge is in locked position, as disclosed in Figure 1.

When it is desired to electrically insulate one or more of the hinge members, an inner sleeve 25 of insulation surrounds the channel shaped member 20 extending the full length thereof between the member 20 and the associated clamping plates 12 and 13.

A similar insulating sleeve 26 surrounds each of bolts 16, and insulating washers 27 are positioned between the heads of the bolts 16 and the nuts 17 and the adjacent surface of plates 13 and 12 respectively.

In the illustrative embodiment of the invention, the insulating material is disclosed in only one of the hinge assemblies 11, the other being disclosed as uninsulated, but it will be understood that either or both of the members 11 may be provided with the insulating material above referred to, and that, if desired, such insulation may be omitted entirely.

The locking device for the hinge construction comprises a U-shaped bolt, generally indicated at 31, having one elongated leg 32 which extends through the aligned bores 19, and terminates in a plate like portion 33, to which is pivotally connected a slotted locking member 34, the member 34 being pivotally connected to the plate like portion 33 as by means of pivot pin 35.

A cotter pin 36 extends through a suitable bore 37 in the end of locking member 34, and precludes complete withdrawal of the bolt assembly from the bores 19. A coil spring 38 is positioned between the outermost lug 18 and the bight 39 of the U-shaped locking bolt.

The other leg 40 of bolt 31 is slightly shorter than leg 32, and is adapted, when in locking position, to extend into the bore 21 to preclude pivotal movement of the hinge assemblies 11 about the pivot formed by the long leg 32.

With the parts in the position as disclosed in Figure 3, it will be readily apparent that the hinge cannot be pivoted until the locking member 34 is rotated about pivot 35 into alignment with leg 32, whereupon spring 38 will serve to bias the bolt 31 outwardly in bore 19 until further movement is stopped by cotter pin 36. When in this position the leg 40 is free of bores 21 of upper plates 12 and 13, and accordingly the hinge assemblies 11 may readily be swung relative to one another.

It is to be understood that the sections 20 encased between the clamping plates 12 and 13, hereinbefore described, may, if desired, comprise integral end portions of metal ladder sections 45, provided with the conventional rungs 46, as shown in Figure 2, or alternatively may serve merely to surround ladder sections, provided the ladder includes bores for the accommodation of bolts 16.

From the foregoing it will now be seen that there is herein provided an improved hinge assembly for folding ladders, or the like, which accomplishes all the objects of this invention, and others, including many advantages of great practical utility and commercial importance.

As many embodiments may be made of this inventive concept, and as many modifications may be made in the embodiment hereinbefore shown and described, it is to be understood that all matter herein is to be interpreted merely as illustrative and not in a limiting sense.

What is claimed is:

1. In a hinge construction for folding ladders or the like comprising two complementary hinge assemblies for engaging adjacent ends of the rails of juxtaposed ladder sections, each comprised of a pair of clamping plates, oppositely offset portions on said plates having first and second sets of aligned bores therethrough, a U-shaped bolt

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having one leg engageable in one set of bores with the other leg engageable in the other set of bores, means securing one leg from disengagement with its associated bores, said means including an extending portion having inner and outer ends and of a length greater than the diameter of said bores, pivotally connected to the end of said one leg for movement relative thereto to a position extending on both sides of said bore and to a second position aligned with said bore, and means on the outer end of said portion precluding complete withdrawal of said one leg from its associated bore, said one leg serving as a pivot for the juxtaposed hinge sections and the other leg retractably engaging the bores of one of the sections to lock and unlock the sections relative to each other.

2. In a hinge construction for folding ladders or the like comprising two complementary hinge assemblies for engaging adjacent ends of the rails of juxtaposed ladder sections, each comprised of a pair of clamping plates, oppositely offset portions on said plates having first and second sets of aligned bores therethrough, a U-shaped bolt having one leg engageable in each of the sets of bores, means securing one leg from disengagement with its associated set of bores, said means including an extending portion having inner and outer ends and of a length greater than the diameter of said bores, pivotally connected to the end of said one leg for movement relative thereto to a position extending on both sides of said bore and to a second position aligned with said bore, means on the outer end of said portion precluding complete withdrawal of said one leg from its associated bore, and spring means normally biasing said bolt outwardly relative to said bores, said one leg serving as a pivot for the juxtaposed hinge sections and the other leg retractably engaging the

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bores of one of the sections to lock and unlock the sections relative to each other.

3. In a hinge construction for folding ladders or the like comprising two complementary hinge assemblies for engaging adjacent ends of the rails of juxtaposed ladder sections, each comprised of a pair of clamping plates, oppositely offset portions on said plates having first and second sets of aligned bores therethrough, a U-shaped bolt having one leg engageable in each of the sets of bores, means securing one leg from disengagement with its associated set of bores, said means including an extending portion having inner and outer ends and of a length greater than the diameter of said bores, pivotally connected to the end of said one leg for movement relative thereto to a position extending on both sides of said bore and to a second position aligned with said bore, means on the outer end of said portion precluding complete withdrawal of said one leg from its associated bore, spring means normally biasing said bolt outwardly relative to said bores, said one leg serving as a pivot for the juxtaposed hinge sections and the other leg retractably engaging the bores of one of the sections to lock and unlock the sections relative to each other, and insulation means between said hinge assemblies and said ladder rails.

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