Jan. 1, 1957 W. J. KNUEPFER 2,776,180

PORTABLE EQUIPMENT AND FOLDING LEGS THEREFOR

Filed July 9, 1953 2 Sheets-Sheet 1

FIG. 1

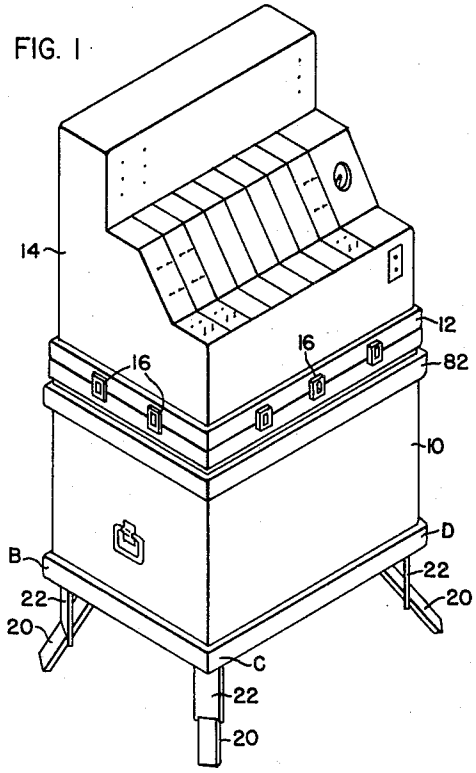


FIG. 2

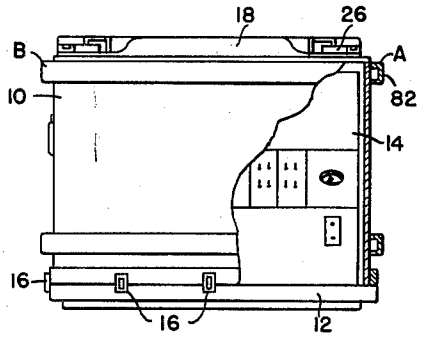


FIG. 8

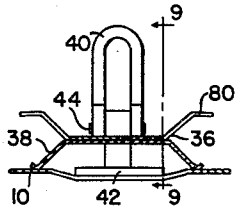


FIG. 9

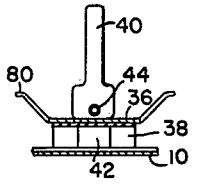
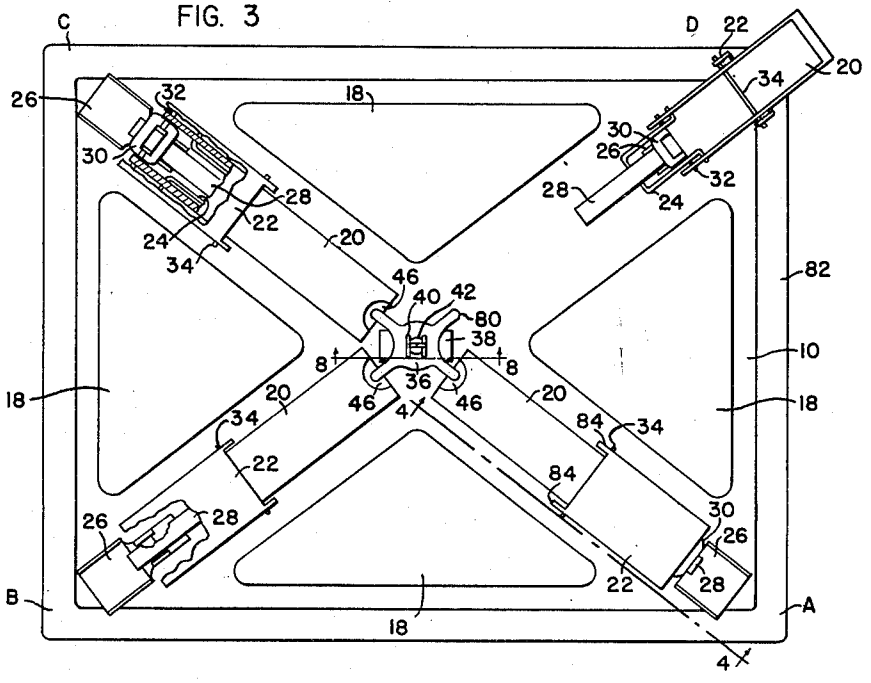


FIG. 3



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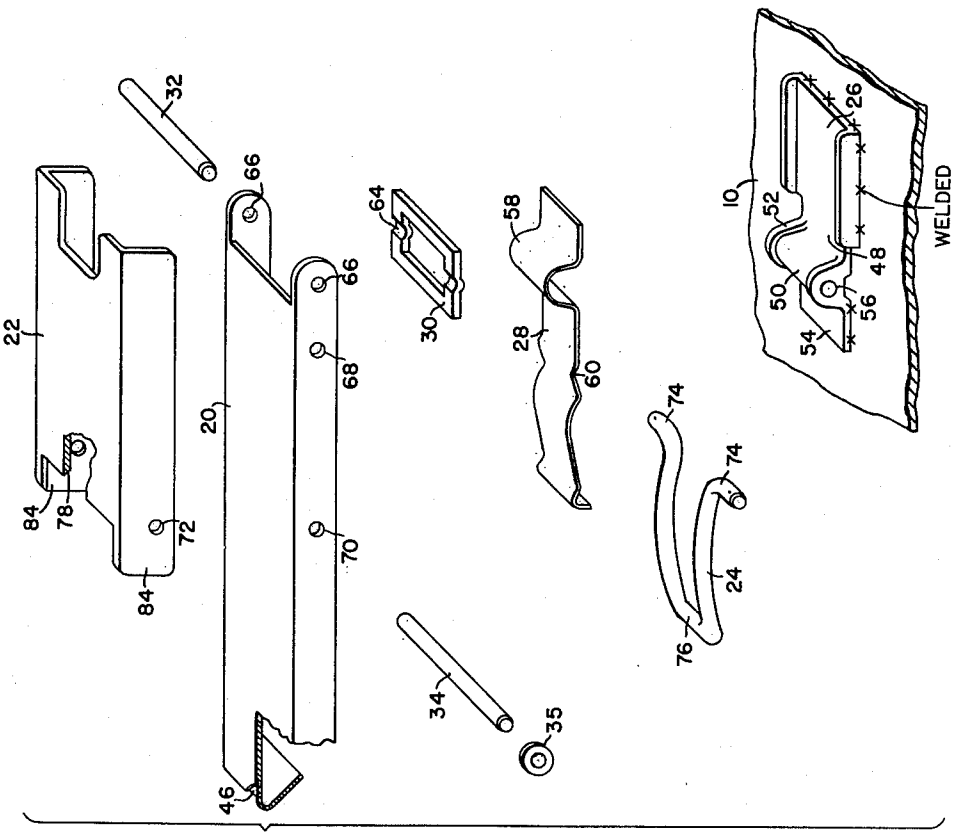


FIG. 7

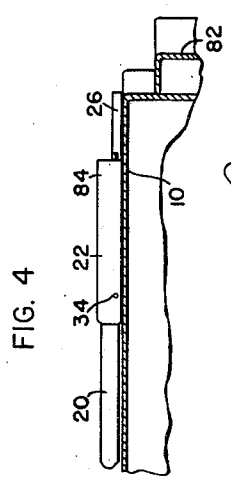


FIG. 4

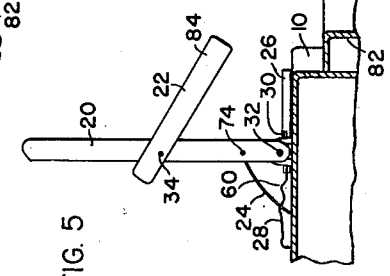


FIG. 5

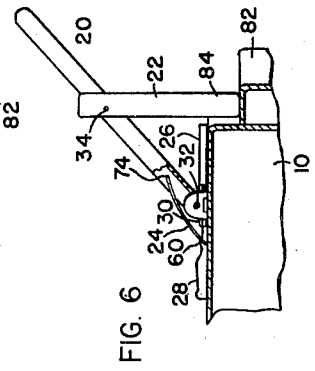


FIG. 6

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2,776,180

PORTABLE EQUIPMENT AND FOLDING LEGS THEREFOR

Walter J. Knuepfer, La Grange, Ill., assignor to International Telephone and Telegraph Corporation, a corporation of Maryland

Application June 9, 1953, Serial No. 360,467

5 Claims. (Cl. 312—255)

This invention relates to portable equipment and folding legs therefor. Its general object is to provide a construction of portable equipment and cooperating folding legs suitable for meeting the rugged field conditions which are commonly encountered by portable leg-supported equipment, such as at construction sites or in military field use.

GENERAL DESCRIPTION

In previous constructions of portable leg-supported equipment, separately attached removable legs have been used, which had to be removed and stored in the equipment for normal transportation, because available folding legs were not considered satisfactory for lack of stability, rigidity, and strength, for example.

One specific object of the invention is to provide a suitable strong and rigid folding leg structure which is light enough to meet stringent weight requirements. Another object is to meet the needs of equipment, such as military field equipment, which must be capable of being quickly set up for use or prepared for movement, by providing a construction wherein the legs are (1) easily and quickly opened or closed without binding (2) are capable of being locked out of the way when folded, and (3) permit lifting and shifting of the equipment without collapse of the legs.

It has been chosen to illustrate the invention as applied to a small portable telephone switchboard for military field use, wherein the shipping container comprises the field support for the switchboard, which is mounted on the base of the container; the overall cover being removed and reversed, and the switchbord placed thereon for use. The improved leg construction is on the overall cover part of the shipping container.

A feature of the invention concerns the use of a compound leg comprising a vertical member supporting the equipment and an outwardly sloping leg member on which the vertical support member bears, thereby providing a strong and stable triangular arrangement.

Another feature resides in the provision of a simple but effective leg-carried bail and a cooperating leaf spring for spring-locking the leg open.

Other features are that the legs each open outwardly from, and close toward, the center, and that a common clamping mechanism is employed at the center for holding the legs securely folded, or closed, for shipment or transportation.

Other objects and features of the invention will appear as the description progresses.

The drawings

The accompanying drawings comprising Figs. 1 to 9 show views of the chosen embodiment of the invention as applied to a portable switchboard, as follows:

Fig. 1 is a pictorial view of the portable switchboard set up for use and supported by the improved leg construction.

Fig. 2 is a front view of the switchboard of Fig. 1 packed for transportation, with the legs on top and folded.

Fig. 3 is a plan view of the assembly of Fig. 2, with three legs folded and one leg open.

Fig. 4 is a sectional view taken generally on line 4—4 of Fig. 3, showing details of a leg in folded position.

Fig. 5 and Fig. 6 show the leg of Fig. 4 partly open and completely open, respectively.

Fig. 7 is an exploded view of the structure of Fig. 4, drawn on a larger scale.

Figs. 8 and 9 are enlarged sectional views showing the clamping mechanism for holding the legs securely folded.

DETAILED DESCRIPTION

Referring generally to the drawings, the illustrated switchboard **14**, mounted on base **12**, is shown in Fig. 1 supported upon the box-like overall cover **10**, and attached thereto with conventional buckles **16**, secured to part **10**. Overall cover **10** is supported by four compound leg structures **20**, **22** according to the invention. These leg structures are located at respective corners A to D of the cover **10**, and are attached to the underside thereof. The cover is directly supported on vertical supports **22**, which are attached to the outwardly sloping legs **20**.

In Fig. 2, the equipment is shown packed for transportation. The switchboard **14** and base **12** of Fig. 1 have been removed from the overall cover **10** following loosening of the buckles **16** on cover **10**; cover **10** has been reversed and placed over the switchboard; the buckles **16** have been refastened in the new position; and the leg assemblies (on the top in Fig. 2) have been folded in toward the center and clamped. A portion of cover **10** has been broken away in this view to show switchboard **14** inside.

Fig. 3, a plan view of the assembly of Fig. 2, shows the leg assembly **20**, **22** open at corner D and folded at corners A to C. The leg assemblies fold between, and flush with, raised portions **18** of cover **10**, with support **22** folded over leg **20**, as seen best at corner A. At corner B, a portion has been cut away through support **22** and leg **20**, and some parts removed, showing bracket **26** and spring **28**. At corner C, a portion of support **22**, and a portion of leg **20** have been cut away, showing details of the assembly.

Fig. 7 is an exploded pictorial view of the structure of a leg assembly. The compound leg comprising support **22** and leg **20**, which are channel shaped for the required strength and rigidity with light weight, is assembled by passing hinge pin **34** through holes **70** in the leg **20** and holes **72** in the support **22**, with washers **35** between the leg and the support at each end of the hinge pin. A leg-carried bail **24** and a cooperating leaf spring **28** are used for spring-locking the leg open, the spring being provided with a detent **60** for the arm **76** of the bail. The ends **74** of the bail are attached in holes **68** of the leg **20**.

A bracket **26** is attached by suitable means, such as welding, in each corner of the surface of cover **10** seen in Fig. 3. This bracket is channel shaped at its outer end **48**, and is flat at its inner end **54**. It has a generally cylindrical part **50** through which there is a hole **56** for receiving hinge pin **32**. In the assembled position, leaf spring **28** has its cylindrical surface **58** placed over the cylindrical surface **50** of bracket **26**, between flanges **52**. Buckle **30** is placed around these cylindrical parts. At corner B in Fig. 3, spring **28** can be seen in place before the buckle **30** is on, and at corner C the buckle **30** is shown in place.

The leg sub-assembly **20**, **22**, **24** is next connected to bracket **26** and spring **28** locked in place, after placing arm **76** of bail **24** under spring **28**, by passing hinge pin **32** through the holes **66** of leg **20**, over depressions **64** of buckle **30**, and through hole **56** of bracket **26**. Cotter pins are used in the ends of hinge pins **32** and **34**, and in the ends **74** of bail **24**.

The operation of a leg assembly is shown particularly in Figs. 4, 5, and 6, with the folded position in Fig. 4, a partly open position in Fig. 5, and the open position in Fig. 6; the raised surface **18** of cover **10** being omitted in these figures for clarity. Quick operation is accomplished by grasping the leg **20** at its end and swinging it around into position. Support **22** slides into position, and swings in relation to leg **20** until its edge **78** (Fig. 7), cut at an angle, bears flat against leg **20**. In Fig. 5 the support **22** is shown raised from its normal sliding position to show its maximum swing in relation to the leg **20**. Bail **24** slides under spring **28** and locks into detent **60** (see Fig. 7) of this spring, effectively holding the leg in place if the equipment is lifted or shifted. A portion of one side of leg **20** is cut away in Fig. 6 to show the position of bail **24**, and other details. Also see the view of an unfolded leg assembly at corner D of Fig. 3. In this embodiment of the invention the support **22** fits around the corner of cover **10** and bears on the reinforcing flange **82** (see Fig. 2), which is welded on to the cover. The strong and stable triangular arrangement provided by the compound leg **20**, **22** of this invention is clearly shown in Fig. 6.

Figs. 8 and 9 are two views of the clamping mechanism which locks the legs securely in folded position, Fig. 8 being taken on line **8**—**8** of Fig. 8, and Fig. 9 being taken on line **9**—**9** of Fig. 8. A mounting member **42** is attached to cover **10** by suitable means, such as welding. Its upper part has a cross section which is generally oblong with rounded ends, as shown in Fig. 3. Leaf spring **38** has a hole the same shape as the cross section of mounting member **42**, on which it fits, so that it can be moved vertically but cannot be rotated. Clamp **36** fits on mounting member **42** above spring **38**, its hole being round to permit rotation as well as vertical movement. Cam **40** is hinged to mounting member **42** by pin **44**. With cam **40** in its vertical position as shown, clamp **36** is loose and freely rotatable to a position in which its arms **80** clear the legs **20** to permit unfolding (see Fig. 3). To lock the legs when they are folded, clamp **36** is first rotated to a position in which its arms **80** are over depressions **46** of the legs **20**, respectively. Cam **40** is then pivoted about pin **44** to the horizontal position, forcing clamp **36** down, depressing spring **38**, and thus holding clamp **36** firmly in place with its arms **80** engaging respective depressions **46** in legs **20** and effectively locking the legs.

As seen in Figs. 3, 4, and 7, when leg **20** is folded and locked, support **22** is held locked in place because its flanges **84** extend outward from the support beyond the hinge pin **34**. These flanges rest against cover **10** and prevent rotation of the folded support **22**.

I claim:

1. In combination, a portable equipment, a leg and means hinging it to said equipment at a first location substantially inward from the periphery of the bottom thereof for an inward-outward swinging movement between an inactive folded position in which it lies against the bottom side of the equipment and an unfolded support position in which the leg member slopes outwardly to support the said equipment, a bar-like leg support and means hinging it to an intermediate portion of the leg for an inward-outward movement between an inactive folded position adjacent to the equipment and an unfolded support position in which it bridges between the said intermediate portion of the leg and a second location on the bottom of the equipment outward from the said first location to define the said support position of the leg, the said support having a channel shape at least in the vicinity of its hinged end and having its flanges extending outwardly of the support beyond the point at which it is hinged, the said outwardly extending flange portions of the support straddling the leg to lie against the bottom of the equipment in the said inactive position of the leg and support, with the free end of the leg extending substantially beyond any portion of the support, and means locking the leg at its free end in folded position against the bottom of the equipment, whereby the said support is consequently locked in folded position by its said outwardly extending straddling flange portion.

2. In combination, a portable equipment, a leg and means hinging it to said equipment at a first location substantially inward from the periphery of the bottom thereof for an inward-outward swinging movement between an inactive folded position in which it lies against the bottom side of the equipment and an unfolded support position in which the leg member slopes outwardly to support the said equipment, a bar-like leg support and means hinging it to an intermediate portion of the leg for an inward-outward movement between an inactive folded position adjacent to the equipment and an unfolded support position in which it bridges between the said intermediate portion of the leg and a second location on the bottom of the equipment outward from the said first location to define the said support position of the leg, the said parts being so constructed and arranged that the free end of the support is freely slideable over the equipment to bring the support from its folded position to its unfolded position responsive to the said leg being moved from its folded position to its unfolded position, the outer portion of the bottom of the equipment being offset upwardly, the said free end of the unfolded support bearing against the said offset portion, which comprises the said second location on the bottom of the equipment, whereby the outward face of equipment which joins the said offset portion of the bottom with the remaining portion thereof acts to limit inward movement of the free end of the support when the leg is in its said support position.

3. In a combination according to claim 2, a portion of the said support substantially displaced from the hinge axis of the support defining a surface which encounters the leg to limit the outward hinging movement of the support beyond its said unfolded support position.

4. In combination, a portable equipment, a leg and means hinging it to said equipment at a first location substantially inward from the periphery of the bottom thereof for an inward-outward swinging movement between an inactive folded position in which it lies against the bottom side of the equipment and an unfolded support position in which the leg member slopes outwardly to support the said equipment, a bar-like leg support and means hinging it to an intermediate portion of the leg for an inward-outward movement between an inactive folded position adjacent to the equipment and an unfolded support position in which it bridges between the said intermediate portion of the leg and a second location on the bottom of the equipment outward from the said first location to define the said support position of the leg, a portion of the support substantially displaced from the hinge axis of the support defining a surface which encounters the leg to limit the outward hinging movement of the support beyond its said unfolded support position, whereby the said leg, support, and equipment lock together in the support position of the leg and support to resist further outward movement of the leg from its said unfolded support position.

5. A combination according to claim 4, wherein the said support is channel shaped having a web and flanges, the said surface comprises the end edge of the web opposite from the end of the support which bears against the said second location on the bottom of the equipment, and the support when in the unfolded support position is substantially perpendicular to the said bottom side of the equipment.

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