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Goetz

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[54] **COUPLING MEANS FOR PORTABLE FENCING AND THE LIKE**

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[51] **Int. Cl.²** **E04H 17/14**

[58] **Field of Search** 256/19, 24, 25, 26, 33, 256/21, 22, 59; 119/20

[56] **References Cited**

UNITED STATES PATENTS

63,829	4/1867	Augspurger	256/26
629,529	7/1899	Simmons	256/26
1,038,470	9/1912	Woodford	256/26
3,072,385	1/1963	Johnson	256/25
3,815,877	6/1974	Turner	256/25

FOREIGN PATENTS OR APPLICATIONS

679,297	9/1952	United Kingdom	256/26

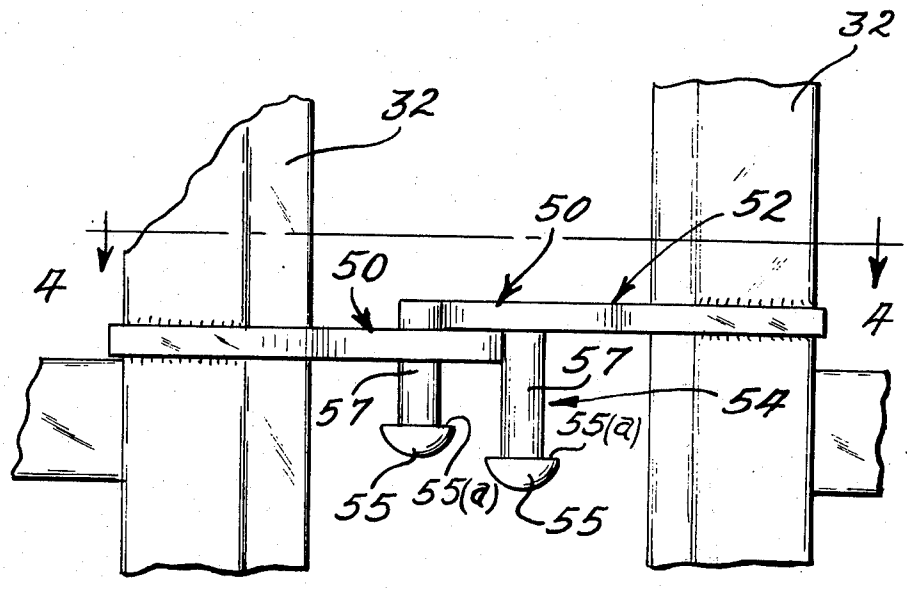
Primary Examiner—Dennis L. Taylor

Attorney, Agent, or Firm—Richard G. Heywood

[57] **ABSTRACT**

Coupling means including both male and female portions, the female portion comprising spaced converging side members forming a tapering slot and the male portion comprising a shank; a pair of said coupling means being readily coupled and uncoupled, the male portion of one coupling means being inserted into the female portion of the other coupling means and retained therein thereby providing a temporary connection between rigid structural units.

12 Claims, 6 Drawing Figures



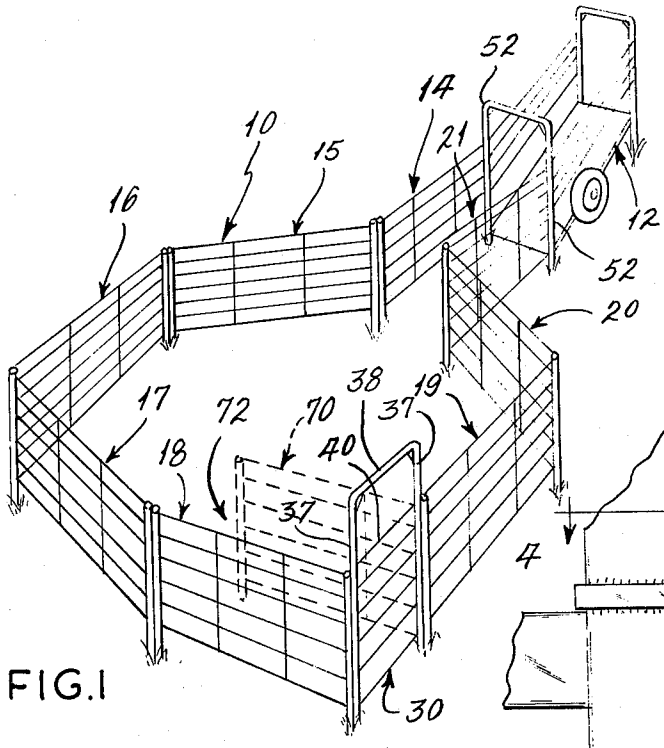


FIG.1

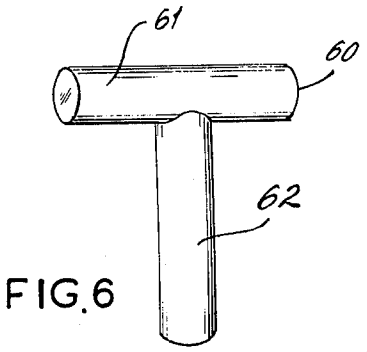


FIG.6

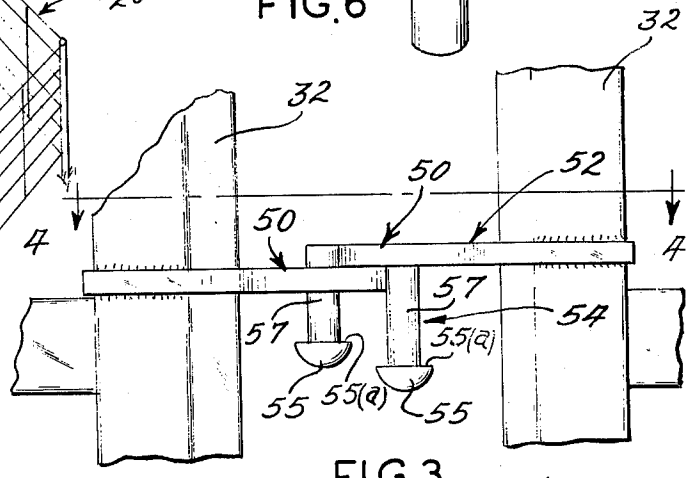


FIG.3

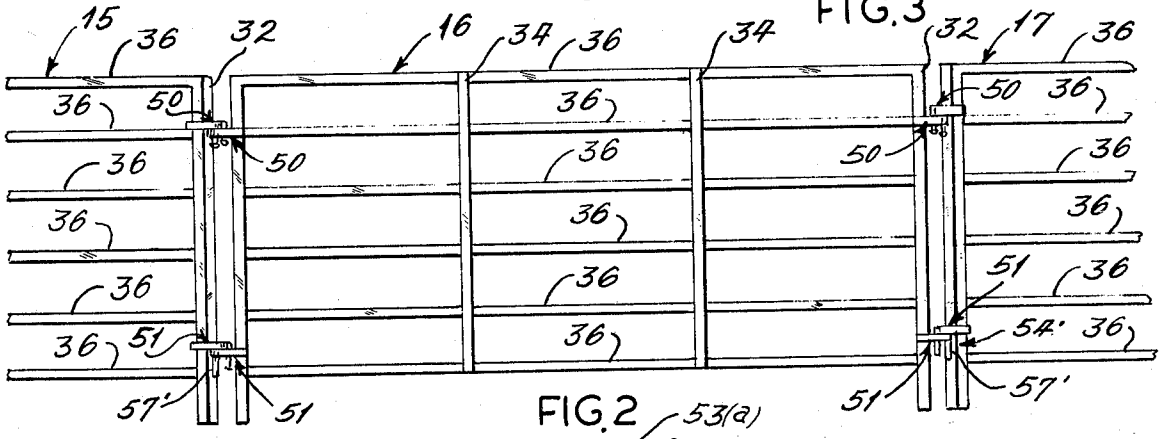


FIG.2

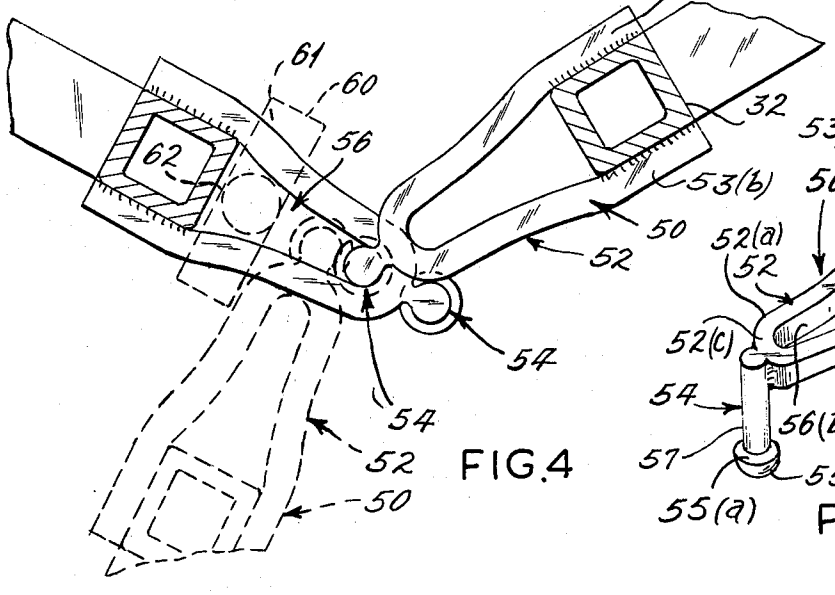


FIG.4

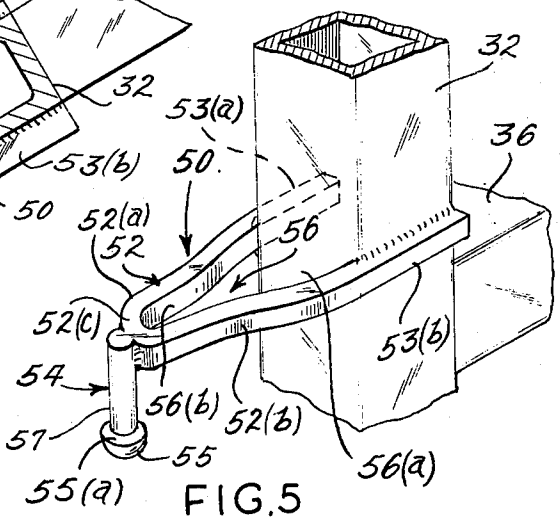


FIG.5

COUPLING MEANS FOR PORTABLE FENCING AND THE LIKE

BACKGROUND OF THE INVENTION

The invention relates generally to coupling means or units useful for linking fences, chutes, gates and other rigid structural units. In the past, portable fencing units had separate male and female coupling portions on opposite ends, the male portion usually comprising vertically spaced, depending pins positioned at one end of a fence section and being selectively receivable in coupling engagement in multiple tubular socket female portions positioned on the adjacent end of a similar fence section. Exacting orientation or alignment of the fence sections is required in these prior art constructions to couple the sections because of the male-female hinge arrangement.

Typical prior art fencing systems employing depending pins adapted to be received in aligned sleeves are shown in U.S. Pat. No. **3,204,606** and its cited patent references. Similarly, U.S. Pat. No. **3,469,822** shows a portable enclosure in which adjacent fence sections are pinned together by precise alignment of female sleeve sections carried by adjacent fence posts.

To overcome the difficulty noted above, the present invention provides a dual coupling unit which includes both male and female portions; a pair of which may be coupled in such a way that no moving parts, pins or other devices are necessary to complete the actual coupling.

It is an object of the invention to provide a coupling device for releasably coupling two rigid structural units.

Another object is to provide means for temporarily connecting two rigid structural units where adjustable angularity between the units is desired.

Another object of the invention is to provide a dual coupling unit which includes both male and female components.

Another object is to provide coupling means for fence sections which may be coupled without exacting orientation or alignment thereof and without having to turn fence sections around to accommodate the male to female coupling connection or orientation thereof.

Another object is to provide a fence section which may be coupled at various angles to similar adjacent fence sections.

Another object is to provide a portable fence section which is set upon the ground rather than being staked or implanted and which is useful in the construction of various sized and shaped pens, corrals or the like.

Other objects and advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description in connection with the accompanying drawings wherein like reference numbers designate like parts and wherein:

FIG. **1** is a perspective view illustrating a portable corral and loading chute utilizing fence sections having coupling means embodying the present invention;

FIG. **2** is an enlarged fragmentary view of several fencing sections showing the coupling means;

FIG. **3** is a greatly enlarged fragmentary view showing a pair of dual coupling means illustrating one embodiment of the invention in coupling engagement;

FIG. **4** shows in full lines an enlarged fragmentary sectional view taken on line **4—4** of FIG. **3**, and shows in broken lines a second coupling means connected together with a locking pin keeper member;

FIG. **5** is an enlarged fragmentary perspective view showing the embodiment of the coupling means shown in FIG. **3**; and,

FIG. **6** is a perspective view of the locking pin keeper member, shown in broken lines in FIG. **4**.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. **1** of the drawings, a portable corral **10** formed of several fence sections having coupling units embodying the invention are illustrated as attached to a portable loading ramp or chute **12** and, as stated, the fence sections are movable or portable in that they are preferably set upon the ground rather than being staked down or implanted therein. The corral **10** includes sections or panels **14, 15, 16, 17, 18, 19,** 20 and **21** and gate panel **30.** Each of the fence sections **14–21,** as best seen in FIG. **2,** may include end posts **32,** intermediate posts **34,** and a number of spaced horizontal members or rails **36** interconnecting the end posts **32** and the intermediate posts **34.** The posts **32** and **34** and the rails **36** may be constructed from any rigid material, such as tubing, pipe, wood or the like, and may be of any cross-sectional configuration. Furthermore, although the panels **14–21** shown in FIGS. **1** and **2** have six rails **36** and two intermediate posts **34,** the invention is not limited to fence sections of this configuration. Also, although the cross pieces or rails **36** and the vertical pieces **32** and **34** are usually made of metal and are welded together where they cross each other, they may be secured by any other conventional means suitable for connecting such units.

The gate panel or section **30,** as shown in FIG. **1,** has slightly elongated end posts **37** interconnected by a cross member or brace **38,** which is welded or otherwise connected to the upper ends of the end posts **37.** A gate **40** is hingedly attached to one of the end posts **37** and is latched on the other side to the other end post **37** in any conventional manner.

In keeping with the objects of this invention, the panels **15–20** and the gate panel **30** are linked or connected together in end-to-end relationship by coupling means **50** and **51** shown in FIG. **2** as upper and lower coupling means respectively on each end of each panel section. Similarly, the end panels **14** and **21** are linked by coupling means **50** and **51** to the panels **15** and **20** and to end posts **52** associated with the loading ramp **12,** which may have a similar construction as the gate section **30** in FIG. **1.**

As best seen in FIG. **5,** the upper dual coupling unit **50** includes a first or female portion **52** and a second or male portion **54.** The female portion **52** has spaced converging side members or arms **52(*a*)** and **52(*b*)** which are shown as having a closed end loop **52(*c*)** to form a keyhole-like slot **56** having a larger or wider opening portion **56(*a*)** and a smaller or narrower and elongated opening portion **56(*b*).** The female portion **52** is preferably constructed of a metallic bar having a square or rectangular cross-section in order to provide maximum latching or coupling contact with the male portion **54,** as described more particularly below. The female portion, however, may be made from tubing, pipe or the like having a round or rounded cross-section. The inner ends **53(*a*)** and **53(*b*)** are fixedly attached by welding or the like to the end posts **32** and,

to facilitate a strong attachment, it is preferred that the end posts have a rectangular or square cross-section as shown. It is also preferred that the female portion **52** be in a plane substantially perpendicular to the plane of the rigid support or end post **32.** The reasons for this orientation will become clear in view of the description which follows.

Still referring particularly to FIG. **5,** the second or male portion **54** includes an enlarged head **55** formed with an abutment surface **55**(*a*) on the end of a reduced shank or neck **57.** Preferably the shank **57** of the male portion **54** is rigidly secured by welding or the like to the closed end loop **52**(*c*) of the female portion so that the enlarged head **55** is in a depending relationship below the female portion **52.** This arrangement is preferred so that when a pair of coupling means are coupled as clearly shown in FIGS. **3** and **4,** the unused male portion **54** (shown as the male portion on the right in FIG. **3**) does not interfere with the coupling. Also, it is preferred that the male portion **54** be in a plane which is substantially perpendicular to the female portion **52.**

As best seen in FIG. **2,** the lower coupling means **51** is constructed similarly to the upper coupling means **50** except, preferably, the male portion **54'** in this embodiment has no enlarged head and the straight shank **57'** is significantly more elongated. This embodiment of the dual coupling means is preferred for the bottom coupling unit since it allows quicker and easier coupling prior to assembly of the upper coupling units. In short, the elongated straight shank **57'** of one of the lower dual coupling units **51** is received in the female opening of the other lower unit to facilitate bringing the upper coupling units **50** into position for final assembly of adjacent fence panels.

In final assembly, the shank **57** of the male portion **54** of one upper coupling unit **50** is passed into the larger opening portion **56**(*a*) of the other coupling unit **50.** The male portion **54** is then moved so as to bring the shank **57** into the narrow slot portion **56**(*b*) as shown in full lines in FIG. **4.** The shank or neck **57** may have a thickness that is slightly greater than the width of the slot **56** adjacent to the closed loop end **52**(*c*) so that the coupling means are secure when the shank **57** of the pin or stud **54** is wedged or drawn into the narrowing parts of the slotted opening **56.** It will be readily apparent that in this position the abutment surface **55**(*a*) of the enlarged head **55** associated with the upper dual coupling means **50** limits relative vertical displacement.

Usually, there are two dual coupling means associated with each end post. For example, as shown in FIG. **2,** the coupling means **50** and **51** are associated with each end post **32,** but fewer or greater numbers of coupling means may be used. With the enlarged head **55** omitted from the lower coupling means **51,** coupling can be easily accomplished by aligning the end posts of the fence sections to be joined with one panel slightly elevated and then by lowering the elevated panel. The lower coupling means **51** is engaged first since the male portion associated therewith has the longer shank **57'.** With the lower coupling means engaged, the upper coupling means **50** is then engaged as described above. Uncoupling is accomplished by reversing the coupling operation.

As indicated, particularly in FIG. **4,** the adjacent fence sections and their coupling means may be at an angle with respect to each other. While shown in solid lines in one position is indicated in FIG. **4,** it is clear that this angle may be widely varied, thus providing a means whereby the associated rigid structural units to be coupled may be linked in end-to-end relationship at various angles with respect to each other. This is greatly advantageous inasmuch as various sized and shaped pens, corrals or the like may be easily constructed wherein the fence sections have the above described coupling means associated therewith. Also, the coupling means may be associated with the end posts **32** in such a way that the mid-point of the slot or loop portion **52**(*c*) is in the plane of the fence section whereby a plurality of fence sections coupled in end-to-end relationship provide a straight line of fencing. On the other hand, when the loop portion **52**(*c*) is offset from the plane of the fence section, a plurality of fence sections in end-to-end relationship provide an offset line of fencing.

In most cases, only one panel section **14–21** or gate section **30** is coupled at each end with another; however, as shown in broken lines in FIG. **1** a second panel such as panel **70** may be coupled by coupline means **50** and **51** to the left end post of fence section **19,** as viewed in this figure. Thus, multiple coupling means may be interconnected to join several panel sections thereto. This arrangement may be advantageous in some cases, as in FIG. **1,** in order to provide a chute **72** associated with the corral gate **40** or otherwise.

The multiple coupling arrangement is further illustrated in FIG. **4** wherein a third coupling means **50** is shown in broken lines in coupling association with the coupling means shown in full lines. To this end, it is important that the smaller opening portion **56**(*b*) of the keyhole-like slot be sufficiently elongated to accommodate two male portions **54** in couplind engagement as shown. Multiple coupling arrangements in addition to the uses described above may be used to provide brace panels along a line of fencing to keep the fencing upright and aligned. Also, by selecting which female portion **52** will have two male portions associated therewith various straight line and offset arrangements of fencing may be provided. This may be advantageous for example in constructing a fencing system which avoids some physical barrier like a tree or a building or in consulting several interconnected enclosures.

This, it is apparent that there has been provided in accordance with the invention a coupling means for portable fencing and the like that fully satisfies the objects, aims and advantages set forth above. A further improvement to the coupling means comprises a keeper or locking member **60,** as shown in FIG. **6** and in broken lines in FIG. **4.** The member **60** has a T-shaped cross-section with a horizontal cross bar **61** and a depending pin **62.** As will be readily appreciated, any such member which blocks the larger portion **56**(*a*) of the keyhole-like slot **56** and is receivable therein may be used in place of the construction shown. A U-shaped bolt of sufficient size to block the portion **56**(*a*), for example, may be used in place of the T-shaped member **60** as the locking member or keeper to prevent dislodgement of the male coupling unit from the narrow slot **56**(*b*). The keeper member **60** may be chained (not shown) or otherwise tethered to the end post **32** or coupling means **50** to avoid misplacement of the keeper member to facilitate fast locking of the coupling means.

Still other alternatives, modifications, and variations and improvements will be readily apparent. For example the coupling means **50** might be used for other ap-

plications wherein an easily coupled and uncoupled means is desired such as in coupline towed vehicles. In this case, the coupling means may be locked in coupling engagement by means of a blocking means adapted to fit between the diverging ends 53(*a*) and 53(*b*), as for example the locking member **60**, thus keeping the pin **54** engaged in the narrow part of the slot opening **56**. The shank **57** of the male portion **54** may also be sized to be received in the end loop 52(*c*) for hinging movement therein while the abutment flange 55(*a*) acts to prevent relative vertical displacement that might cause disengagement. Other such alternatives, modifications and variations will be readily apparent to those skilled in the art and it is intended to embrace such alternatives, modifications and variations as fall within the spirit and broad scope of the subjoined claims.

What is claimed is:

1. A first coupling unit adapted for releasable engagement with a second coupling unit for coupling together two relatively movable rigid structures, said first unit comprising a female portion having spaced sides forming a slot with relatively wide and narrow areas and a male portion having a shank extending from said female portion and an enlarged head on the end of the shank; the second coupling unit having at least one of said female and male portions of said first coupling unit, and said first and second coupling units being adapted to be releasably coupled together with the male portion shank of one of said units being receivable into the wide area of the female portion of the other of said units for seating engagement in the narrower area of the female portion of the other unit.

2. The first coupling unit according to claim **1**, in which said enlarged head of said male portion shank of said one unit includes an abutment surface in opposed relation with the spaced sides of the female portion of the other unit and being adapted to limit relative vertical displacement between said first and second coupling units when interconnected.

3. The first coupline unit according to claim **1**, in which the female and male portions are in substantially right angular planes.

4. The first coupling unit according to claim **1**, in which the narrow area of said female portion is elongated and adapted to receive at least two of the male portion shanks of second coupling units.

5. In combination, a first coupling unit for a first rigid structure comprising a female portion including spaced-apart converging side walls and a closed and wall forming a tapering slot having a relatively wide area adjacent to the first rigid structure and a relatively narrow area extending therefrom to said closed end wall, said first coupling unit also comprising a male portion including a shank having one end connected to the female portion and an enlarged head on the other end of said shank in spaced relation with the female portion; and a second coupling unit for a second rigid structure comprising female and male portions similar to those of said first coupling unit, said first and second coupling units being adapted to be releasably coupled together with the male portion shank of either of said units being selectively receivable in the wider area of the female portion of the other of said units for interlocking seating engagement in the narrower area of the female portion of said other unit.

6. The combination according to claim **5**, in which the female and male portions of said first coupling unit are in substantially right angular planes, and said male portion shank is connected to the closed end wall and depends therefrom in spaced relation to said first rigid structure.

7. The combination according to claim **6**, in which the enlarged head of said male portion shank includes an abutment surface in opposed relation below the spaced side walls of the female portion of said second unit and limits relative vertical displacement between the connected first and second coupling units.

8. The combination according to claim **5**, in which said first rigid structure comprises a first vertical end post of a first movable fence section, and in which said second rigid structure comprises a second vertical end post of a second movable fence section positioned adjacent to said first vertical end post of said first fence section.

9. The combination according to claim **8** in which two of said first coupling units are associated with the first end post and in which two second coupling units are associated with the second end post.

10. The combination according to claim **8**, which further includes a T-shaped keeper pin having a cross-bar extending across said side walls of the female portion of the coupling unit having the male portion shank positioned in the narrower area of its slot, and having a depending pin extending vertically into the wider area of such slot.

11. The combination according to claim **8**, in which said first and second fence sections include other vertical end posts and interconnecting fence members, and said other end posts being provided with other coupling units having female and male portions similar to those of said first coupling unit whereby said coupling unit on either end of said first fence section is adapted for releasable engagement with the coupling unit on either end of said second fence section.

12. In combination, a portable fencing arrangement having a series of relative movable fence sections adapted to be connected together, each of said fence sections having spaced vertical end members and interconnecting brace members; the improvement which comprises vertically spaced first and second dual coupling units rigidly secured to each end member of each of said fence sections, said first dual coupling unit comprising a female portion having spaced converging side walls and a closed end wall forming a tapering slot with a relatively wide area adjacent to the end member and a relatively narrow area extending therefrom to said closed end, said first coupling unit also comprising a male portion having a shank on one end, the other end of the shank of the male portion being connected to the female portion in spaced relation to the enlarged head with the female and male portions being disposed in substantially right angular planes, said second dual coupling unit being positioned below the first coupling unit on the end member of the fence section and comprising a female portion having spaced converging side walls and a closed end wall forming a tapering slot with a relatively wide area adjacent to the end member and a relatively narrow area extending therefrom to said closed end, said second coupling unit also comprising a male portion having a shank connected to the female portion with the female and male portions being disposed in substantially right angular planes, said first and second

coupling units on the end members of adjacent fence sections being adapted to be releasably coupled togehter with the male portion shanks of the first and second coupling units of either of said adjacent fence sections being selectively receivable in the wider area of the female portions of the other of said adjacent fence section units and laterally movable relative thereto for seating engagement in the narrower areas of the female portions of such other units, the enlarged head of said male portion shank associated with the first dual coupling unit including an abutment surface limiting relative vertical displacement between the interconnected coupling units and the respective adjacent fence sections.

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