Dec. 9, 1958 D. E. KEECH 2,863,238

SIGN STANDARD

Filed Jan. 16, 1956

FIG. 1.

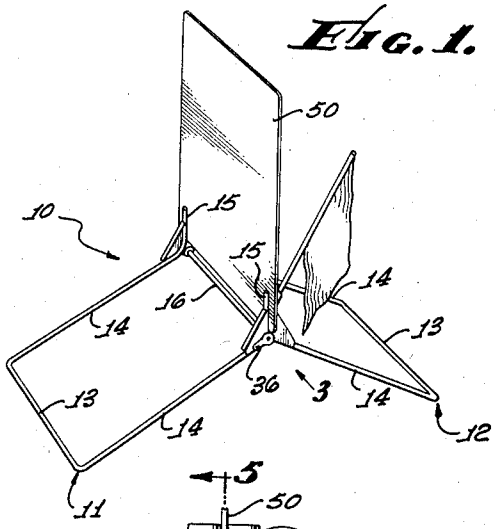


FIG. 2.

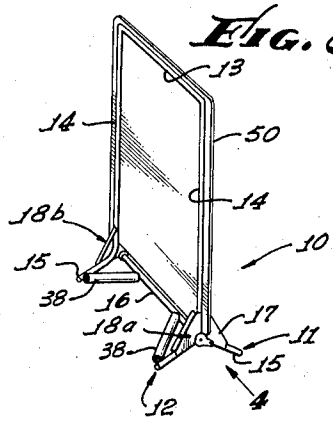


FIG. 3.

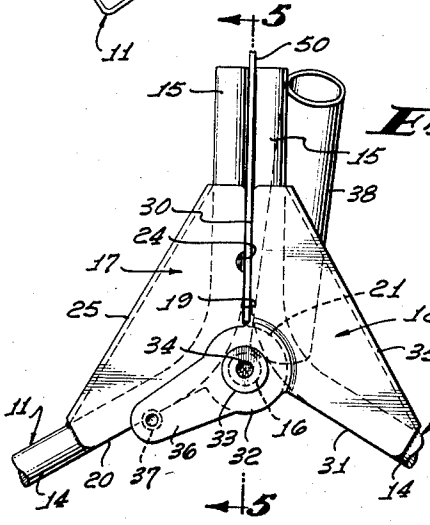


FIG. 4.

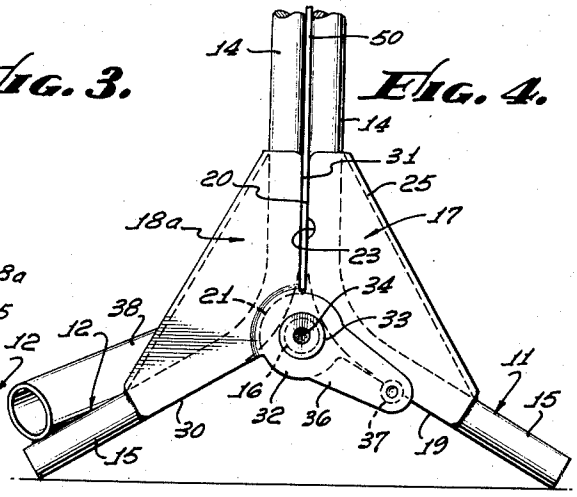
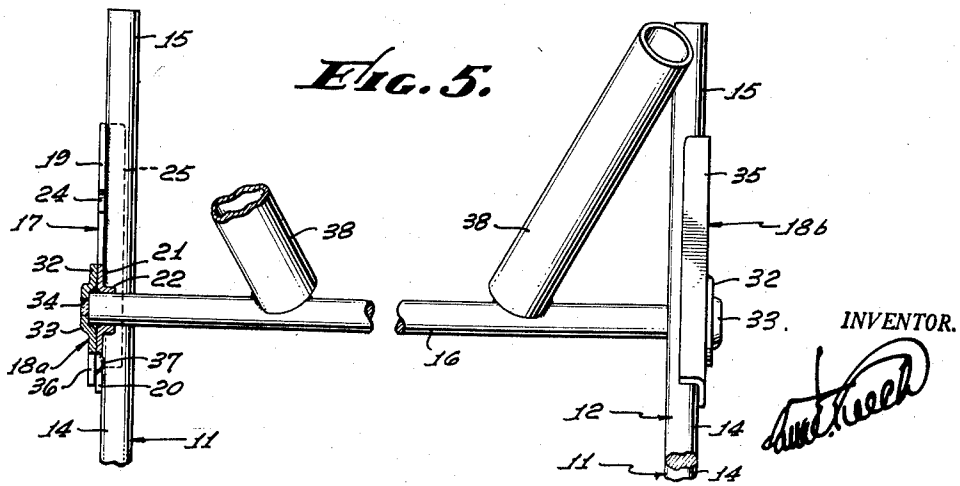


FIG. 5.



INVENTOR.

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SIGN STANDARD

Dana E. Keech, Los Angeles, Calif.

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22 Claims. (Cl. 40—125)

This invention relates to standards for holding erect signs made of stiff sheet material and is particularly useful for holding erect such signs employed in controlling traffic on the highways. It is an improvement on the sign standard disclosed in U. S. Letters Patent No. 2,718,080 issued September 20, 1955, to Mearl S. Eaton.

The Eaton standard includes a pair of base frames made of light steel rod which are preferably U-shaped to provide a pair of long co-planar arms joined at the base of the U by a straight cross-bar and having a pair of co-planar short arms bent from the other ends of the long arms and related thereto by equal obtuse angles. These two frames are pivotally united by bearing means on an axis close to the apices of said obtuse angles to permit said frames to be optionally related in either of two positions.

In the first of these positions the long arms of the respective frames are spread apart in wide downward angled relation to form supporting legs with the connecting cross-bars of the frames resting on the ground, and the short arms extending vertically upward to hold the sign upright therebetween. The second of said positions is the reverse of the first, with the short arms spread apart in wide downward angled relation to form supporting legs and with said long arms extending vertically upward. If desired the sign may also be held between the long arms of the Eaton standard when the frames thereof are disposed in said second position.

The standard disclosed in the Eaton patent required two holes to be formed in the sign which holes are penetrated, when the sign is placed in the standard with the latter in its first position, by latch studs which are bent from the extremities of one pair of said short arms and after extending through said holes in said sign, pass through eyes formed on the ends of the other pair of short arms. One of these studs has a pin hole which then receives a pin, this locking the frames of the Eaton standard in said first position with the sign mounted therein.

It is an object of the present invention to provide a sign standard of the Eaton type, the construction of which is simplified and which is thus lighter and less expensive to build.

It is another object of the present invention to provide such a sign standard which does not require the perforation of the sign in order for the standard to be locked in one of its sign supporting positions.

It is a still further object of the invention to provide such a sign standard in which the frames thereof will be automatically latched in one of the aforesaid two positions of the frames of said standard merely by virtue of the frames being placed in said position.

A yet further object of the invention is to provide such a standard in which said frames will be thus automatically locked in either of said positions merely by said frames being placed in said position.

Yet another object of the invention is to provide such a sign standard in which the lock provided for retaining the frames of the standard in one of said two positions is a detent, the locking effect of which can be broken by the application of a substantial torque to said standard tending to rotate said frames out of the position in which the latter are locked.

Each of the U-frames employed in the standard shown in the Eaton patent is closed by a rod, opposite ends of which are welded thereto adjacent the points of juncture of the long arms and short arms of the frame. One of these rods is provided with a pair of bearings which are then welded to the other of said rods to provide the bearing means for pivotally relating the frames.

It is still another object of the present invention to provide a sign standard of the Eaton type in which one of the aforesaid rods is eliminated thereby decreasing the weight of the standard without substantially impairing the strength thereof.

The light rod (which is preferably one-half inch in diameter) used in the frames of the Eaton standard requires bracing between the short arms and long arms of the frames to enable the standard to retain its form under the abuse to which it is ordinarily subjected as a piece of highway maintenance equipment. Separate braces of rod are provided in said Eaton standard which are welded at their opposite ends to the long and short arms of the standard frames.

It is yet another object of the invention to provide a sign standard of the Eaton type in which the bracing required between the long and short arms of the frames may be effected in a less expensive manner than the rod braces employed in the Eaton standard.

To save the cost of shipping manufactured standards long distances, it is highly desirable to produce these at dispersed points from basic stocks of materials already widely distributed and available for use.

The major portion of sign standards, of the type to which the invention relates, consists of parts made of lengths of steel rod which can be bought almost anywhere. These parts moreover can be made from these rod lengths by simple rod cutting and bending operations, equipment for performing which is locally available.

It is therefore a still further object of the invention to provide a double set of hinge plates which are relatively light and can be cheaply made at a central hinge plate production point, and which readily nest together for inexpensive shipment to each of a complex of widely dispersed standard assembly points where the rod parts may be made and then assembled with the hinge plates by a simple welding process, the equipment for performing which is also locally available.

The manner of accomplishing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which

Fig. 1 is a diagrammatic perspective view of a preferred embodiment of the standard of the invention supporting a sign with the two frames of the standard related in the first of two operative positions in which said standard may be used.

Fig. 2 is a diagrammatic perspective view illustrating the standard shown in Fig. 1 with the frames thereof in the second of said two operative positions and with the sign held in the standard between the long arms of the standard.

Fig. 3 is an enlarged fragmentary end elevational view of a portion of the standard of the invention taken in the direction of the arrow 3 in Fig. 1.

Fig. 4 is a similar view of the invention to Fig. 3 taken in the direction of the arrow 4 in Fig. 2.

Fig. 5 is a vertical sectional view taken on the line 5—5 of Fig. 3, and illustrates the construction of the hinge plates of the invention and the manner in which

these are employed in assembling the standard of the invention.

Referring specifically to the drawings the preferred embodiment of the invention therein illustrated comprises a sign standard **10** having two frames **11** and **12** which are identical and each of which is preferably formed by bending a single piece of steel rod of about one-half inch in diameter to give this a U-shape, each frame including a cross-bar **13**, two co-planar long arms **14** and two co-planar short arms **15** which are bent from the long arms at an obtuse angle, preferably about 120°. The standard **10** also includes a shaft **16** which is slightly longer than the outside width of each of the frames **11** and **12** and is formed of the same material as said frames. While ordinary low-carbon steel may be used for the frames and shaft of the standard **10**, a steel rod with a carbon content of about 1040 is preferable in order to render the standard sufficiently resistant to bending forces to which it is subjected in use.

The frames **11** and **12** and shaft **16** are assembled by means of these elements being welded to hinge plates **17** and **18**. These hinge plates are preferably stamped out of low-carbon sheet steel of about fourteen gauge. The hinge plate **17** is generally triangular in shape with approximately radial edges **19** and **20** which converge towards a hub portion **21** having a bearing **22** drawn inwardly from the center thereof to provide a bearing opening for rotatably receiving one end of the shaft **16**. Notches **23** and **24** are preferably formed in edges **19** and **20** for a purpose to be disclosed later. Bent at right angles to the plate **17** on the outer edge thereof is a reinforcing flange **25**. The hinge plates **17** are welded to the arms **14** and **15** of the frame **11** so that the axis of the bearings **22** lies in a plane bisecting the angles between said arms **14** and **15** and a slight distance inward from the apices of said angles.

The hinge plates **18** are of two different types which will be distinguished by identifying these, respectively, as hinge plates **18*a*** and **18*b***.

Hinge plates **18** have triangular body portions providing approximately radial edges **30** and **31** which converge on hub portions **32**, each of which has a cup **33** and hole **34** formed co-axially therein. The hubs **32** of the hinge plates **18** are offset outwardly from the rest of the plates slightly more than the thickness of the material of which the hinge plates are made.

The plates **18** also have bent from outer edges thereof reinforcing flanges **35** which correspond and perform the same function for the frame **12** as the flanges **25** of the hinge plates **17**.

Hinge plate **18*a*** differs from hinge plate **18*b*** in having a detent arm **36** extending from the hub **32** of the plate in symmetrical relations with the edges **30** and **31** of the plate **18*a***. Die-formed inwardly from an end portion of the arm **36** is a dimple **37**, the purpose of which will be made clear later.

The hinge plates **18** are welded to the outer faces of the arms **14** and **15** of the frame **12** of the standard as shown in Figs. 3 and 5, with the axis of the cups **33** and holes **34** in a plane bisecting the angles between said arms and a slight distance inward from the apices of said angles. When the plates **18** are so welded to the frame **12** the cups **33** overlie opposite ends of the shaft **16** as shown in Fig. 5. The cups **33** are now arc-welded to opposite ends of the shaft **16** through the holes **34**.

The welding of plates **17** and **18** to the frames **11** and **12** may be done by spot welding or this may be accomplished by arc-welding. The welding of the cups **33** to the shaft **16** is preferably by arc-welding.

The standard **10** is also preferably provided with a pair of flag holding sockets **38** which are welded at their opposite ends to shaft **16** and to the short arms **15** of the frame **12** as shown in Figs. 3 and 5. These sockets are made of sections of tubing and are positioned before being so welded so that the shaft **16** extends across the lower ends of these sockets to provide a stop for the handles of flags extended into these sockets.

When the various parts of the standard **10** are assembled as above described and as shown in Figs. 1 and 2, the standard is in readiness for operation with the frames **11** and **12** thereof in either of two relative positions. In the first of these positions (Fig. 1) the long arms **14** are swung apart at an angle of approximately 120° with the cross-bars **13** of said frames resting on the ground and with the short arms **15** of said frames extending upwardly. If the short arms **15** are allowed to come together without a sign being disposed therebetween, they will, by their mutual engagement, prevent the arms **14** swinging further apart.

Where it is desired that the standard **10** be used to support a sign **50** with the frames **11** and **12** in the first of said two positions, the sign is inserted between the arms **15** as these swing towards each other so that the sign will be gripped between the short arms **15** and held in upright position on said standard as shown in Figs. 1 and 3. As the short arms **15** move inward to grip said sign, the dimple **37** of the arm **36** swings downwardly just beyond the radial edge **20** of the adjacent hinge plate **17** so as to spring inward behind said edge and in notch **23** to lock the standard **10** with the frames **11** and **12** in sign gripping relation in the first of their two positions.

The provision of the detent **37** is important in that there is a tendency where a high wind is blowing against the sign **50**, and this is gripped between the arms **15**, for the frames **11** and **12** to be rotated to swing the short arms **15** apart and allow the sign to escape from between these arms. The latch arm **36** is provided to prevent this happening. Where unusually high winds are encountered both of the hinge plates **18** may be provided with latch arms **36** and dimples **37** so as to double the detent effect provided by only one such arm.

When it is desired to remove the sign **50** from a standard **10**, the standard is lifted by taking hold of the shaft **16** so as to slightly release the grip of the short arms **15** on the sign, which permits the sign to be drawn upward from between these short arms. The standard may then be turned on its side and lower ends of the long arms **14** seized in the hands and these arms swung together so as to break the locking action of the dimple **37** on the edge **20** of the adjacent hinge plate **17** thereby permitting the arms **14** to be swung together. This causes the dimple **37** to ride along an arcuate path over the hinge plate **17** so that when the arms **14** are brought together to hold a sign **50** therebetween as shown in Figs. 2 and 4, the dimple **37** will ride over and spring inward behind the radial edge **19** of said hinge plate **17**, and into notch **24** therein, thereby locking the frames **11** and **12** in the second of their two relative operating positions. The short arms **15** are at this time swung apart at a wide divergent angle and are adapted to serve as supporting legs for the standard **10** and a sign **50** supported therein.

When the standard is thus locked with the frames **11** and **12** in this second of their two operative positions and it is desired to open up the standard for returning the same to the first of said two positions, the cross bars **13** of the frames **11** and **12** are seized in the hands and pulled apart with substantial force to break the lock provided by the detent dimple **37** before swinging the frames **11** and **12** to the first of their operative positions.

Reference has heretofore been made to the axis of the shaft **16** lying in planes bisecting the obtuse angles formed between the long and short arms respectively of the frames **11** and **12**. It is now desired to point out that the shaft axis is thus at all times disposed symmetrically relative to the two frames **11** and **12** and that this axis is spaced inward from each of the planes of the inner faces of the long and short arms respectively

of the frames 11 and 12, a distance which is equal approximately to one-half the thickness of the sign 50. Thus when the frames 11 and 12 are related as shown in Figs. 1 and 3 in the first of their two operative positions and with the sign 50 placed between the short arms 15, the inner faces of these arms move into flush engagement with the opposite faces of the sign when the frames 11 and 12 reach said first position and are locked in said position by the latch dimple 37.

Similarly, when the frames 11 and 12 are swung about the axis of the shaft 16 until these frames assume the second of their operative positions as shown in Figs. 2 and 4 and with the sign 50 disposed between the long arms 14, which now extend vertically upward, the inner faces of these arms move into flush engagement with the sign 50 as the frames 11 and 12 are locked in said second operative position by the latch dimple 37. It will thus be seen that whichever position the frames of the standard are in, with the sign 50 supported thereby, the arms gripping the sign lie with their inner faces flush with the sign throughout the length of said arms.

The claims are:

1. In a standard for a sign made of stiff sheet material, the combination of: a pair of like rod frames, each frame including a cross member opposite ends of which are rigidly united with a pair of co-planar long arms having, at one end of said frame, a pair of co-planar short arms united end-to-end with said long arms and related thereto by equal obtuse angles; a shaft for said standard; two bearings rotatably mounted on said shaft adjacent the opposite ends thereof; and means for uniting opposite ends of said shaft with one of said frames and for uniting said bearings individually with the other of said frames to pivotally connect said frames in symmetrical relation with the axis of said shaft and with said axis coinciding with the intersection of planes bisecting said obtuse angles, whereby, said frames may be optionally related in either of two positions, in the first of which said long arms of said frames are juxtaposed in closely spaced parallel opposed pairs with said short arms extending apart in symmetrically divergent relation, while in the other of said positions, said short arms are juxtaposed in closely spaced parallel opposed pairs with said long arms extending apart in symmetrically divergent relation.

2. A combination as in claim 1 including means spaced apart by said shaft for holding said bearings in a fixed spaced relation.

3. A combination as in claim 1 in which each of said bearings is embodied in a hinge plate which lies against and is welded to one pair of long and short arms of the frame with which said bearings are united, and in which the means for uniting said shaft with the other of said frames comprises another pair of hinge plates, each of which is welded to one end of said shaft and is also welded to an adjacent pair of long and short arms of the frame to which said shaft is united.

4. A combination as in claim 3 in which each of said hinge plates is provided with reinforcing flanges bent from outer edges thereof, the opposite ends of each of said flanges lying close to one of the short and long arms to which the plate having said flange is welded, said flange uniting with the plate on which it is formed to cause the latter to constitute a rigid brace between said long and short arms.

5. A combination as in claim 3 in which one of the hinge plates united with said shaft is provided with a latch arm which overlies the bearing hinge plate associated with said shaft hinge plate and is provided with means for interlocking with said bearing hinge plate when said frames are related in one of their two aforesaid positions so as to retain said frames in said position against inadvertent displacement therefrom.

6. A combination as in claim 3 in which an arm is provided on one of the shaft mounting hinge plates which arm overlies the bearing mounting hinge plate associated therewith, said arm overlying one of the radial edges of said last mentioned hinge plate when said frames are related in said first position and overlying the other of said radial edges when said frames are related in the second of said positions; and a detent provided on said arm and extending into yieldable detent relation with one or the other of said radial edges whenever said frames are placed in a corresponding one of their two positions aforesaid, said arm being under tension to shift said detent inwardly behind one of said radial edges to automatically lock said frames in whichever of said two positions said frames may be placed.

7. A combination as in claim 6 in which said detent arm is an integral part of the hinge plate on which it is provided and in which said detent constitutes a dimple outstruck from said detent arm, and in which notches are provided in said radial hinge plate edges to receive said dimple.

8. In a standard for a sign made of stiff sheet material, the combination of: a pair of rigid frames, each including a cross member on opposite ends of which are fixed, in planes lying at right angles to said cross member, a pair of co-planar long arms having a pair of co-planar short arms united end-to-end with said long arms and related thereto by equal obtuse angles; and means for assembling said frames and pivotally relating the same about an axis which is symmetrically related to said frames and lies at the intersection of planes bisecting said obtuse angles.

9. In a standard for a sign made of stiff sheet material, the combination of: a pair of rigid frames each of which includes a pair of co-planar long arms and a pair of co-planar short arms, the latter being united with said long arms at one end of said frame to form equal obtuse angles with said long arms; and means for assembling said frames and pivotally relating the same about an axis which is symmetrically related to said frames and lies at the intersection of planes bisecting said obtuse angles.

10. In a standard for a sign made of stiff sheet material, the combination of: a pair of rigid frames each of which includes a pair of co-planar long arms and a pair of co-planar short arms, the latter being united with said long arms at one end of said frame to form equal obtuse angles with said long arms; and means for assembling said frames and pivotally relating the same about an axis which is symmetrically related to said frames and lies at the intersection of planes bisecting said obtuse angles, said axis being spaced from the planes of inner faces of said arms a distance approximately equal to one-half the thickness of said sign.

11. A combination as in claim 9 in which said pivotal means includes a shaft opposite ends of which are united with said long and short arms of one of said frames adjacent their points of juncture; and independent bearings rotatable on adjacent portions of said shaft and separately united directly with the long and short arms of the other of said frames adjacent their points of juncture.

12. A combination as in claim 10 in which said frames are formed of rod, and in which said means for pivotally relating said frames includes a shaft, the length of which is approximately equal to the width of said frames at the juncture between said long and short arms, and two pairs of hinge plates, one of said pairs being welded to the long and short arms of one of said frames in the area of their juncture and the other of said pairs of plates being welded to the long and short arms of the other of said frames in the area of their juncture; hub portions provided on said plates which overlap; bearings provided in the inner of said hub portions for receiving opposite end portions of said shaft; and means for uniting said shaft ends with the outer of said hub portions, the outer of said hub portions being offset outwardly from the hinge plates

on which they are formed to permit the inner of said hub portions to overlap portions of the frame to which the plates having said inner hub portions are not united and thereby preventing end play on said shaft of said hinge plates having said inner hub portions.

13. A combination as in claim 12 in which said outer hinge plate hub portions are provided with outwardly shaped cups which are co-axial with said shaft and receive opposite ends of the latter, in which holes are provided in said cups, and in which said means for attaching ends of said shaft to said outer hinge plate hub portions comprises welding material applied through said holes to said shaft and said cups.

14. Hinge means for pivotally uniting a shaft and a pair of rigid frames to form a sign standard, each frame including a pair of co-planar long arms and a pair of co-planar short arms, the latter being united with said long arms at one end of said frame to form equal obtuse angles with said long arms, said hinge means comprising: two pairs of hinge plates approximating triangles in shape, said plates, when in use, being welded to said frames with two sides of said triangles in substantial alignment with said arms; and hubs provided by portions of said plates towards which said two sides converge, said hubs of said two pairs of plates, with said plates so applied to both of said frames, being adapted to be assembled in overlapping coaxial relation with two of said hubs disposed axially inwardly from the others; and bearings provided in that pair of said hubs which are adapted to be disposed axially inwardly whereby said bearings may receive opposite ends of said shaft, and said shaft ends be concentrically secured to the axially outwardly disposed hubs to unite said frames for rotation about the common axis of said hubs.

15. A combination as in claim 14 in which the hubs which are adapted to be disposed axially outwardly when assembled, are bent axially outwardly from their respective hinge plates to allow the other hubs to lie inwardly from said outer hubs in the same plane as said hinge plates, said inner hubs being substantially circular and of such diameter that the inner hubs are overlapped inwardly by said frames, when the assembly aforesaid is completed, whereby endwise movement of said bearings on said shaft is prevented.

16. Hinge means for pivotally uniting a pair of rigid frames with pivot means for the latter to form a sign standard, each frame including a pair of co-planar long arms and a pair of co-planar short arms, the latter being united with said long arms at one end of said frame to form equal obtuse angles with said long arms, said hinge means comprising: two pairs of hinge plates approximating triangles in shape, said plates, when in use, being welded to said frames with two sides of said triangles in substantial alignment with said arms; and hubs provided by portions of said plates towards which said two sides converge, said hubs of said two pairs of plates, with said plates so applied to both of said frames, being adapted to be assembled in overlapping coaxial relation, with two of said hubs disposed axially inwardly from the others; and coaxial bearings provided in the hubs of one of said pairs of plates for receiving said pivot means whereby said hubs may be axially and pivotally united with the hubs of the other pair of hinge plates to pivotally unite said frames for rotation about the common axis of said hubs.

17. A combination as in claim 16 in which said plates have angle flanges along the third sides of said triangles to provide stiffening angle braces between the long and short arms of said frames.

18. A combination as in claim 16 in which the hubs of said other pair of hinge plates are offset outwardly, at their juncture with said plates, to lie parallel and in overlapping contact with the hubs having bearings when both pairs of hinge plates are assembled with said frames as aforesaid.

19. A combination as in claim 16 in which cups extend axially outwardly from the hubs of said other pair of hinge plates to receive and center said pivot means relative to said hubs having said cups.

20. A combination as in claim 19 in which holes are provided in the centers of said cups for receiving fastening means for securing said pivot means in said cups.

21. A combination as in claim 16 in which the hub of one of said plates has a detent arm which overlies the adjacent plate when both said pairs of plates are assembled with said frames as aforesaid; and means for making interlocking engagement between said detent arm and said adjacent plate to latch said frames in a given rotational relation about their pivotal axis.

22. A combination as in claim 21 in which said obtuse angles are approximately one hundred and twenty degrees; and a button projecting from said detent arm which button is yieldably urged by said detent arm inwardly in latching relation respectively with the aforesaid arm-aligned side edges of said adjacent hinge plate when said frames are rocked to one or the other of their two extreme rotational relations about their pivotal axis.

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