April 22, 1958 C. E. WRIGHT ET AL 2,831,583

VISE STAND

Filed June 30, 1954 3 Sheets-Sheet 1

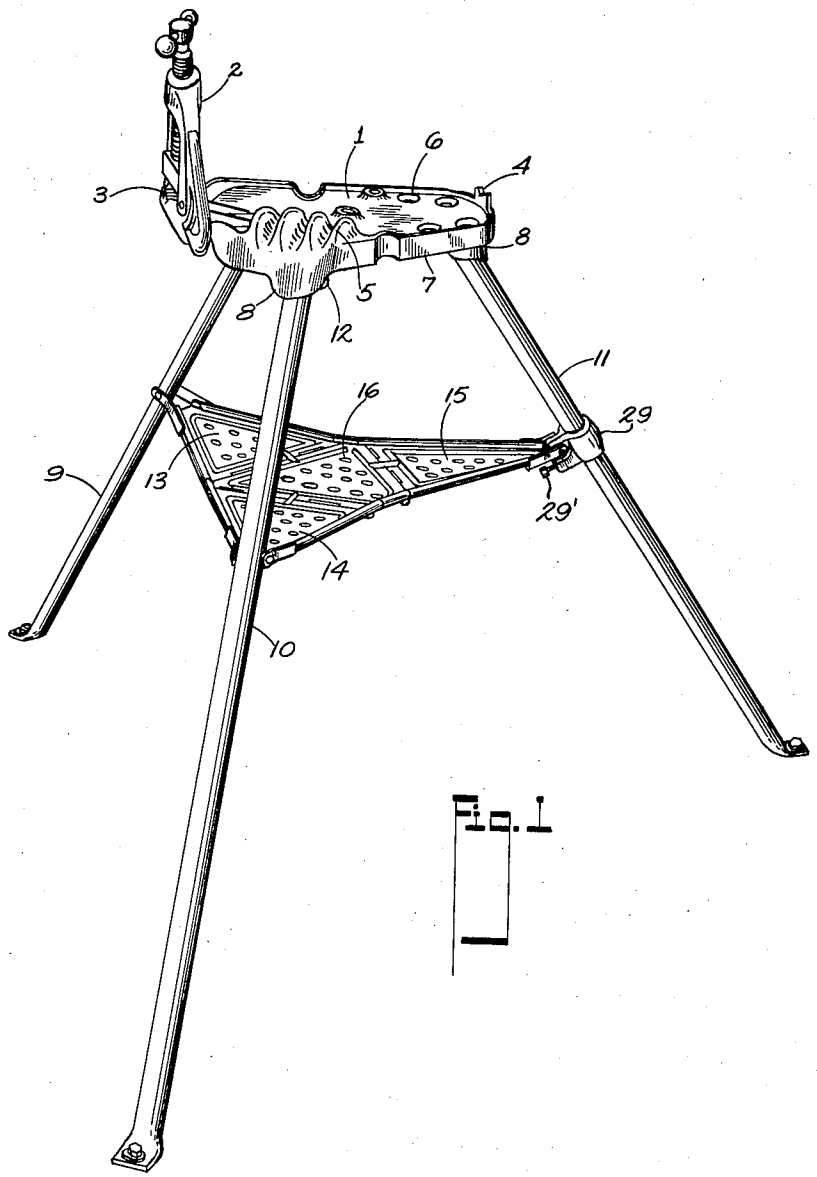


Fig. 1

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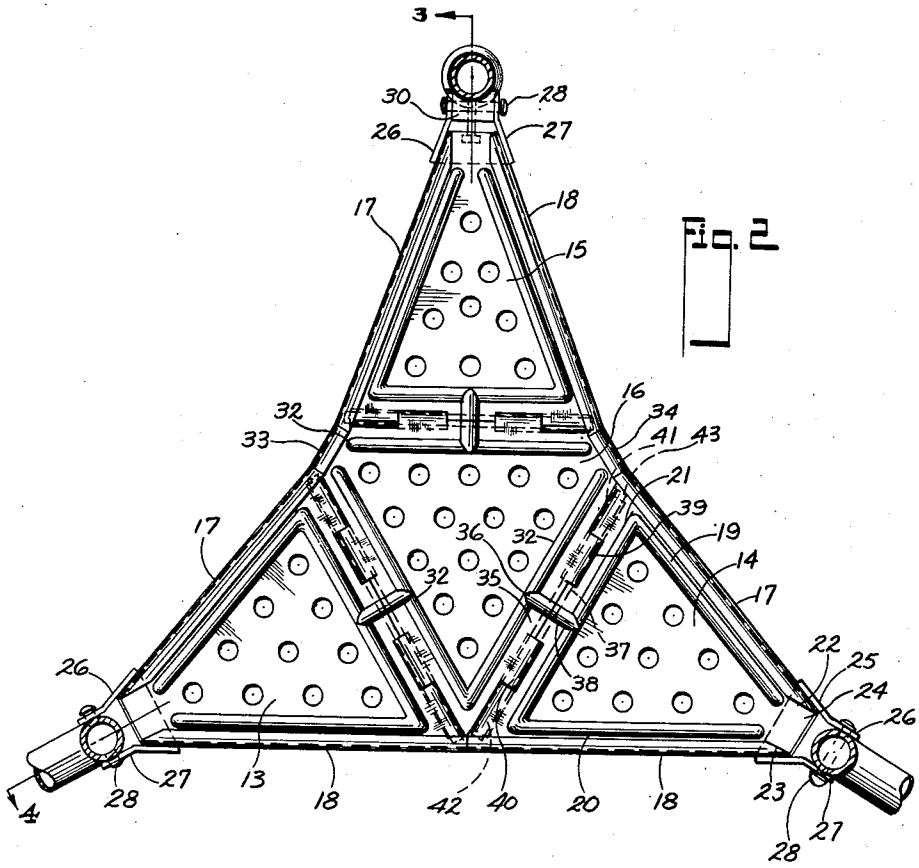


Fig. 2

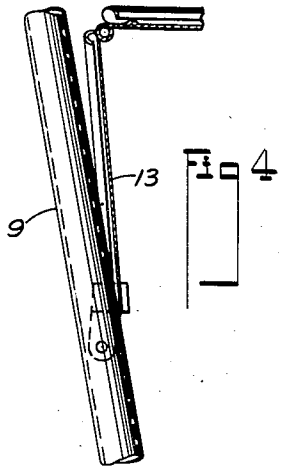


Fig. 4

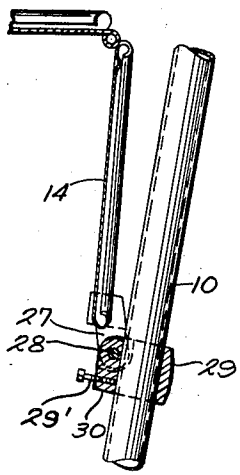


Fig. 3

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VISE STAND

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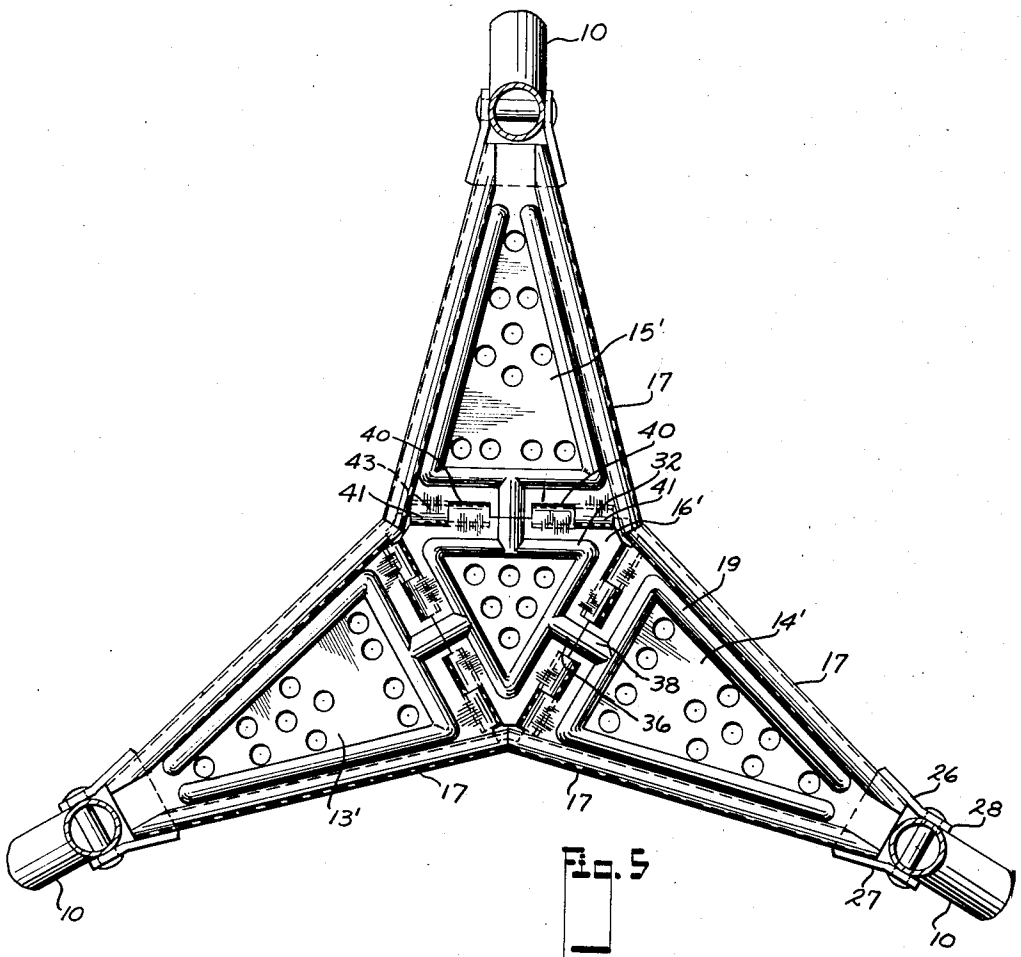


Fig. 5

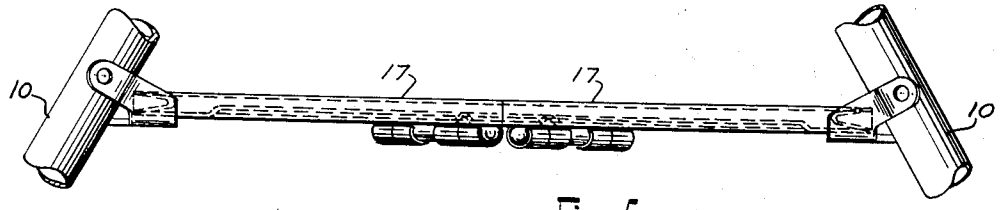


Fig. 6

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2,831,583

VISE STAND

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Application June 30, 1954, Serial No. 440,332

8 Claims. (Cl. 211—149)

This invention relates to stands or benches for use by mechanics and more particularly to a stand of this type in which improved means in the form of a tray is provided for bracing the legs of the stand when it is in use.

Benches or stands utilized by mechanics, such as plumbers, gas and steam fitters, and more particularly stands of this type which are provided with a vise for securing pipes in position to be threaded, must be sufficiently rigid to maintain the legs in an extended position when high forces are applied to the stand. To enable the stand to be easily transported, however, it is desirable to provide a bracing means which is comparatively light in weight and which may be folded to permit the lower end portions of the legs of the stand to be moved inwardly into engagement with each other.

It is the aim of the present invention to provide a bench or stand of this type which may be constructed in a simple and economical manner and in which improved means is provided for rigidly bracing the legs of the stand while it is in use which bracing means is so constructed that it serves as a tray for tools. In the improved structure, a central plate and three corner plates are provided in which the plates are arranged to rigidly brace each leg when the legs are in their extended position. The corner plates are similar in shape to each other and some of them may therefore be accurately stamped or otherwise formed in the same die. To provide bracing means which is comparatively light in weight, each of the corner plates and the central plate may be, and preferably, is, formed of sheet metal having reinforcing peripheral ribs and is provided with a plurality of apertures in the mid-portion. The apertures lighten the structure and also permit escape of foreign particles therethrough. The bracing means provides a convenient support for tools which may be laid upon the plates which thus forms a suitable tray.

It is therefore an object of the present invention to provide a stand or bench for mechanics in which improved means in the form of a tray is provided to maintain the legs of the stand in an extended position.

Another object of the invention is to provide bracing means in the form of a tray for the legs of a stand including a plurality of plates pivotally secured to each other in which some of the plates are similar to each other and may be readily stamped or formed in the same die and wherein the tray and legs may be folded up for carrying purposes.

A further object of the invention is to provide an improved stand for use by mechanics including an improved bracing means for the legs when the stand is in use in which the bracing means consists of a substantially equilaterally-shaped center plate and a corner plate pivotally secured to each side of the center plate, the outer end of each of which corner plates is pivotally secured to a leg of the stand and the parts of the bracing means being arranged in such a manner that any tendency of any one of the legs to collapse is resisted by the center plate and the corner plates.

The invention will be better understood by reference to the accompanying drawings, in which:

Fig. 1 is a side elevational view of the stand in which the legs and bracing means are in their extended position;

Fig. 2 is an enlarged plan view of the bracing means in its extended position, the legs being shown in section with a portion of two of the legs extending beyond the sectional line; and

Figs. 3 and 4 are cross sectional views taken on a plane passing through the line 3—3 and 4—4 of Fig. 2, looking in the direction of the arrows and showing the position of two of the corner plates and the central plate when the legs are in their folded position.

Fig. 5 is a view similar to Fig. 2 of a modification of the invention; and

Fig. 6 is a side elevational view thereof.

As illustrated in the drawings, the stand comprises an upper head **1** which may be of any desired shape for use by mechanics, steam fitters or plumbers. As shown, it may provide a support for a vise **2** which is secured to the front end of the head and in which are arranged jaws **3** for engaging a pipe to be threaded, the opposite end of which carries a pipe support **4** upon which a pipe is adapted to rest during a threading operation. A portion of the head may also be formed to provide bending grooves **5**. Also arranged in the head are a plurality of openings **6** for holding various tools or for receiving the ends of pipes which are to be bent. The head is also provided with a peripheral flange **7** which extends above the face portion of the head and with a plurality of sockets **8** in which the upper ends of legs **9**, **10** and **11** are pivotally mounted by suitable means, such as pins **12**. The sockets provide brackets having oppositely extending sides and the legs may be pivotally mounted on pins extending through the brackets inwardly of their outer edges to permit the legs to swing from the position shown in Fig. 1 to the folded position shown in Figs. 3 and 4.

Improved means are provided for maintaining the legs of the stand or bench in an extended position as shown in Figs. 1 and 2 which bracing means may be moved to a folded position to permit the lower ends of the legs to be moved into engagement with each other. The improved bracing means constitute a feature of the present invention and includes three corner plates **13**, **14** and **15** and a central plate **16**. The corner plates are similar to each other and each is substantially in the form of an isoceles triangle. The apex portion of one of the corner plates is secured to leg **9**, the apex portion of the second corner plate is secured to leg **10**, and the apex portion of the third corner plate is secured to leg **11**. The central plate **16** is substantially in the form of an equilateral triangle and arranged along each side of the central plate is one of the corner plates which is pivotally secured thereto, thereby forming a triangularly shaped bracing member.

Each of the corner plates is so constructed that comparatively high strength and rigidity is provided without unduly increasing the weight. For this purpose, the corner plates are formed of sheet metal and the metal at the sides of each corner plate is turned upwardly and inwardly to form reinforcing tubular beads **17** and **18** as illustrated in Figs. 2 and 3 and bent upwardly along the sides and base of each corner plate are arcuate-shaped ribs as indicated by the numerals **19**, **20** and **21**. The metal is sufficiently rigid that the reinforcing tubular beads **17** and **18** are maintained in their upwardly and inwardly turned position. However in addition they may be welded to the outer portions of ribs **19** and **20** over the entire length of the tubes or at spaced portions thereof if desired.

For securing the corner plates to the legs, the upwardly extending ribs **19** and **20** terminate a short distance from

the outer end of each corner plate and the tubular beads **17** and **18** terminate in angle-shaped portions **22** and **23** to provide a rectangularly shaped portion **24** to which a bracket **25** is secured.

Each bracket **25** may be of any suitable form which will permit folding movement of the bracing means and the inward movement of the legs. As shown, each comprises an arcuate-shaped portion which is secured by suitable means, such as welding, to the end portions of reinforcing tubular beads **17** and **18** and is provided with outwardly extending arms **26** and **27** which may be pivotally connected to the legs in any suitable manner. The arms **26** and **27** connected to corner plates **13** and **14** and each of the legs **9** and **10**, respectively, are provided with aligned openings through which a pin or bolt **28** extends which is secured in place by heading the same over or by removable means, such as a cotter pin. The rectangularly-shaped portion extending from the apex portion of corner piece **15** is secured to leg **11** in a somewhat similar manner. It will be noted that leg **11** is arranged oppositely to the vise and a collar **29** is arranged upon leg **11** through which a set screw **29'** extends which engages the leg **11** to hold the collar in position. The collar is provided with an inwardly extending boss **30** provided with an opening which is aligned with the openings in the arms **26** and **27** and the pin or bolt **28** extends through the aligned openings in the arms **26** and **27** and in the boss **30**.

As previuosly stated, the center plate **16**, which is also formed of sheet metal, is substantially in the form of an equilateral triangle and is provided with upwardly extending ribs **32** of arcuate cross section disposed adjacent each side of the plate and with two outwardly extending portions **33** and **34**, one of which is arranged between side reinforcing tubular beads **17** of corner plates **13** and **15** and the other between side reinforcing tubular beads **17** and **18** of corner plates **14** and **15**. The outwardly extending portions of the central plate are formed by turning the metal upwardly and inwardly to provide tubes, which, when the support is extended form a continuation of the reinforcing tubular beads **17** on corner plates **13** and **15** and reinforcing tube **34** forming a continuation of the reinforcing tubular beads **17** and **18** on corner plates **14** and **15**. The central plate is also provided at each side with a central portion **35**, each of which is provided with an upwardly extending arcuate-shaped bead **36** and each of the central portions on the center plate mates with a similar portion **37** provided with an upwardly extending arcuate-shaped bead **38** extending inwardly from the central portion of the base of each corner plate.

Each of the corner plates may be hingedly secured to one side of the central plate by any suitable means which will permit the plates to be folded upwardly when upward pressure is applied to the bracing means but which will resist downward pressure of the bracing means. As shown, each side of the central plate is provided with spaced cylindrical knuckles **39** and **40** which may be formed by bending tabs extending from the central plate on each side of its central portion **35** downwardly and inwardly into the form of tubes and welding the inner edges of the tubes to the lower side of the central plate and in a like manner, a pair of spaced knuckles **41** and **42** are provided on each corner plate which may be formed by bending inwardly extending tabs of metal downwardly and outwardly and then welding the outer edge of the tubes to the lower surface of each corner plate. Knuckles **41** and **42** on each corner plate are arranged outwardly of and in alignment with knuckles **39** and **40** on the adjacent side of the center plate and pivot means, such as a bolt **43**, is passed through one pair of knuckles and below the mating plane of projections **35** and **37** on the center and corner plates, and then through the other pair of knuckles.

It will be noted that the portion **35** and the arcuate-shaped bead **36** on the center plate engage flush with the portion **37** and bead **38** on each corner plate and that the connecting arms **26** and **27** extend upwardly from each corner plate. It is therefore impossible for the plate to be folded downwardly. In the construction shown, it will also be apparent that the pressure on each leg will be resisted by the center plate and by each of the corner plates. When pressure is applied upwardly on the center plate, however, it may be moved upwardly to the position shown in Figs. 3 and 4, moving legs **9**, **10** and **11** inwardly and as the legs are moved inwardly toward each other, the center plate and each of the corner plates assume the position shown in Figs. 3 and 4.

The apertures **62** in the plates enable the plates to be kept clean and also lighten the structure. It will also be noted that when the plates are assembled, the upwardly and inwardly extending reinforcing tubes **17**, **18**, **33** and **34** provide a peripheral rim around the entire assembly which not only serves to reinforce the plates but also provides means for retaining tools placed on the tray which is thus formed.

It will be apparent that because two of the connections to the legs are fixed and the other movable that this adjustment enables the tray to be leveled in spite of tolerances in manufacture. In their spread position, the tray holds the legs against further spreading, therefore confining the strain on the pivot points **12** for the legs on the stand to that point preventing undue outward strain on the legs from acting as a lever and breaking the boss **8**.

It will be noted that a tray as provided in Fig. 2 lends itself to attachment and holding of three legged stands where one of the legs is spaced a greater distance from the other two legs than they are spaced from each other.

In Figs. 5 and 6 there has been illustrated a tray where the legs are spaced equi-distant from each other. In this instance only two dies need be used, one to form the center portion and the other to form the three outer parts. The corner plates are illustrated at **13'**, **14'** and **15'**. Inasmuch as they are all the same it need only be pointed out that they are provided with the tubular beads **17** which define the edges and the ribs **19** which add strength. Each plate has arms **26** and **27** extending from its apex which are hingedly secured to the leg by a pin **28**.

The center plate **16** is an equilateral triangle provided with the central rib **32** which is triangular in form. The edges of the center plate are provided with hinge eyes **40** which extend opposite hinge eyes **41** on the corner plates and in which the pintle pins **43** are inserted, and which hingedly secure the center plate and corner plates together.

The corner plates and center plate are each provided with the upwardly extending ribs **38** and **36** which provide abutting surfaces that keep the plates from collapsing in a downward direction and also provide rigidity for the hinge structure since they abut each other in their extended position.

Although the adjustable hinge point is not shown in these figures it is contemplated that one may be used as shown in Figs. 1 to 5.

It will therefor be seen that we have provided a tool supporting tray, which in combination with the legs of a vise stand or the like provides a rigid lock for holding the legs in extending position, provides a support for tools when the bench is in use and folds up between the legs when they are moved inwardly for storage or transportation. The structure is light but due to its construction very strong.

Having thus described our invention we are aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of the invention as defined by the appended claims.

We claim:

1. A work bench provided with a head and three legs, the upper portion of said legs being pivotally connected to said head, and said legs being movable from an extended position in which they support said head to a

folded position in which the lower portion of the legs extend toward each other, and means for bracing said legs, said means including a central plate having three sides and a corner plate pivotally secured to each side of the central plate, each of said corner plates being substantially in the form of an isosceles triangle with its base portion secured to the central plate along which it is arranged and its apex portion extending outwardly adjacent one of the legs to thereby provide a substantially triangular bracing means, each of said corner plates having an upwardly extending rim, and means pivotally securing the apex portion of each of said corner plates to the leg adjacent thereto.

2. A work bench provided with a head and first, second and third legs, the upper portions of which are pivotally connected at spaced points to said head and which are movable from an extended position in which they support said head to a folded position in which the lower portions of the legs extend toward each other, and means connected to said legs and movable outward thereby to brace said legs in their extended position, said means including a central plate having three sides of substantially the same length, a corner plate arranged along each side of the central plate, each of said corner plates being substantially in the form of an isosceles triangle, the central portion of the base of which engages the central portion of the side of the central plate along which it is arranged, and each side of the central plate being provided with a pair of downwardly extending knuckles arranged on each side of its central portion and each of the corner plates having downwardly extending knuckles arranged on each side of its central portion and in alignment with the downwardly extending knuckles on the side of the central plate along which it is arranged, pivot means extending through the knuckles on each side of the central plate and the knuckles on each corner plate which pivot means extends below the central engaging portions of the central plate and each corner plate to reinforce the engaging portions of said plates, the apex portion of one of said corner plates being arranged adjacent to the first leg, the apex portion of the second corner plate being arranged adjacent to the second leg, and the apex portion of the third corner plate being arranged adjacent to the third leg, and means pivotally connecting the apex portion of each corner plate to the leg adjacent thereto.

3. A work bench provided with a head and first, second and third legs, the upper portions of which are pivotally connected at spaced points to said head and being movable from an extended position in which they support the head of the bench to a folded position in which the lower portions of the legs extend toward each other, and means connected to said legs and movable outward thereby to brace said legs in their extended position, said means including a central plate having three sides of substantially the same length, a corner plate arranged along each side of the central plate, each of said corner plates being substantially in the shape of an isosceles triangle, a central portion of the base of each of which engages the central portion of the side of the central plate along which it is arranged, and each side of the central plate being provided with spaced downwardly extending knuckles arranged on each side of its central portion and each of the corner plates having downwardly extending knuckles arranged on opposite sides of its base portion which are in alignment with the downwardly extending knuckles on the central plate, pivot means extending through the aligned knuckles and below the central portions of the central plate and each corner plate to reinforce the central portions of the central plate and each corner plate, the apex portion of one of said corner plates being arranged adjacent to the first leg, the apex portion of the second corner plate being arranged adjacent to the second leg, and the apex portion of the third corner plate being arranged adjacent to the third leg, means connected to and extending upwardly at an angle from the apex portion of each of the corner plates, and means pivotally connecting the upwardly extending means to the leg adjacent thereto.

4. A brace for the legs of a work bench, said brace comprising a substantially triangular center plate and three corner plates each having a base pivotally connected to a respective side of the center plate, said center plate at each side presenting an upstanding rib and downturned knuckles on opposite sides of said upstanding rib, each of said corner plates at its base, presenting an upstanding rib aligned with the upstanding rib on the adjacent side of the center plate to abut against said last-mentioned rib when the corner plate is positioned level with the center plate and extending outward therefrom, each of said corner plates at its base presenting downturned knuckles on opposite sides of its upstanding rib, the knuckles on the base of each corner plate being in endwise alignment with the knuckles on the adjacent side of the center plate, and a hinge pin extending through the knuckles on the base of each corner plate and the knuckles on the adjacent side of the center plate and beneath the upstanding ribs on the base of each corner plate and the adjacent side of the center plate.

5. The brace of claim 4, wherein each corner plate has an upstanding rim which extends along each of its side edges away from its base, said center plate has a first short marginal edge disposed between the adjacent side edges of a pair of the corner plates and a second marginal edge disposed between the remaining side edge of one of the corner plates of said pair and the adjacent side edge of the remaining corner plate, and said center plate at each of said short marginal edges has an upstanding rim which forms a continuation of the rims on the adjacent side edges of the corner plates.

6. A work bench comprising a bench head and three legs pivotally secured to said head and adapted to be folded together and to be spread apart to extended positions for supporting the head, and means to brace said legs in their extended positions against inward and outward movement and to provide a support for tools comprising a substantially triangular center plate having hinge eyes along each of its edges, three substantially triangular leg plates hingedly secured at their inner edges to the respective edges of the center plate and hingedly secured at their outer ends to the respective legs, said leg plates at their inner edges having hinge eyes aligned with the hinge eyes on the adjacent edges of the center plate, pintles extending through the aligned hinge eyes to pivotally connect the leg plates to the center plate, each of said leg plates having a tubular reinforcement along its free edges away from its inner edge, the tubular reinforcements on the adjacent free edges of a pair of adjacent leg plates being positioned to abut each other endwise at the inner edges of the leg plates when said leg plates are level with the center plate to limit the upward hinging movement of said leg plates, at least one of the hinge connections between a leg plate and the corresponding leg being adjustable longitudinally of the leg.

7. A work bench comprising a bench head and three legs pivotally secured to said head and adapted to be folded together and to be spread apart to extended positions for supporting the head, and means to brace said legs in their extended positions against inward and outward movement and to provide a support for tools comprising a substantially triangular center plate having hinge eyes along each of its edges, three substantially triangular leg plates hingedly secured at their inner edges to the respective edges of the center plate and hingedly secured at their outer ends to the respective legs, said leg plates at their inner edges having hinge eyes aligned with the hinge eyes on the adjacent edges of the center plate, pintles extending through the aligned hinge eyes to pivotally connect the leg plates to the center plate, each of said leg plates having a tubular reinforcement along its free edges away from its inner edge, the tubular rein-

forcements on the adjacent free edges of a pair of adjacent leg plates being positioned to abut each other endwise at the inner edges of the leg plates when said leg plates are level with the center plate to limit the upward hinging movement of said leg plates, the center plate and each of the leg plates having a strengthening rib extending substantially parallel to each of its edges and spaced inward therefrom.

8. The work bench of claim 7, wherein the center plate is formed with a transverse rib extending transversely outward from each said strengthening rib thereon to the adjacent edge of the center plate, each leg plate is formed with a transverse rib extending transversely outward to its inner edge from the strengthening rib which is adjacent said inner edge, the transverse rib on each leg plate being aligned with the transverse rib on the adjacent edge of the center plate to abut against said last mentioned rib when the leg plate is level with the center plate, the hinge eyes on each edge of the center plate are formed by downturned knuckles disposed on opposite sides of the respective transverse rib, the hinge eyes on the inner edge of each leg plate are formed by downturned knuckles disposed on opposite sides of the respective transverse rib and in endwise alignment with the downturned knuckles on the adjacent edge of the center plate, and the respective pintles extend through the aligned knuckles and beneath the respective abutting transverse ribs.

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