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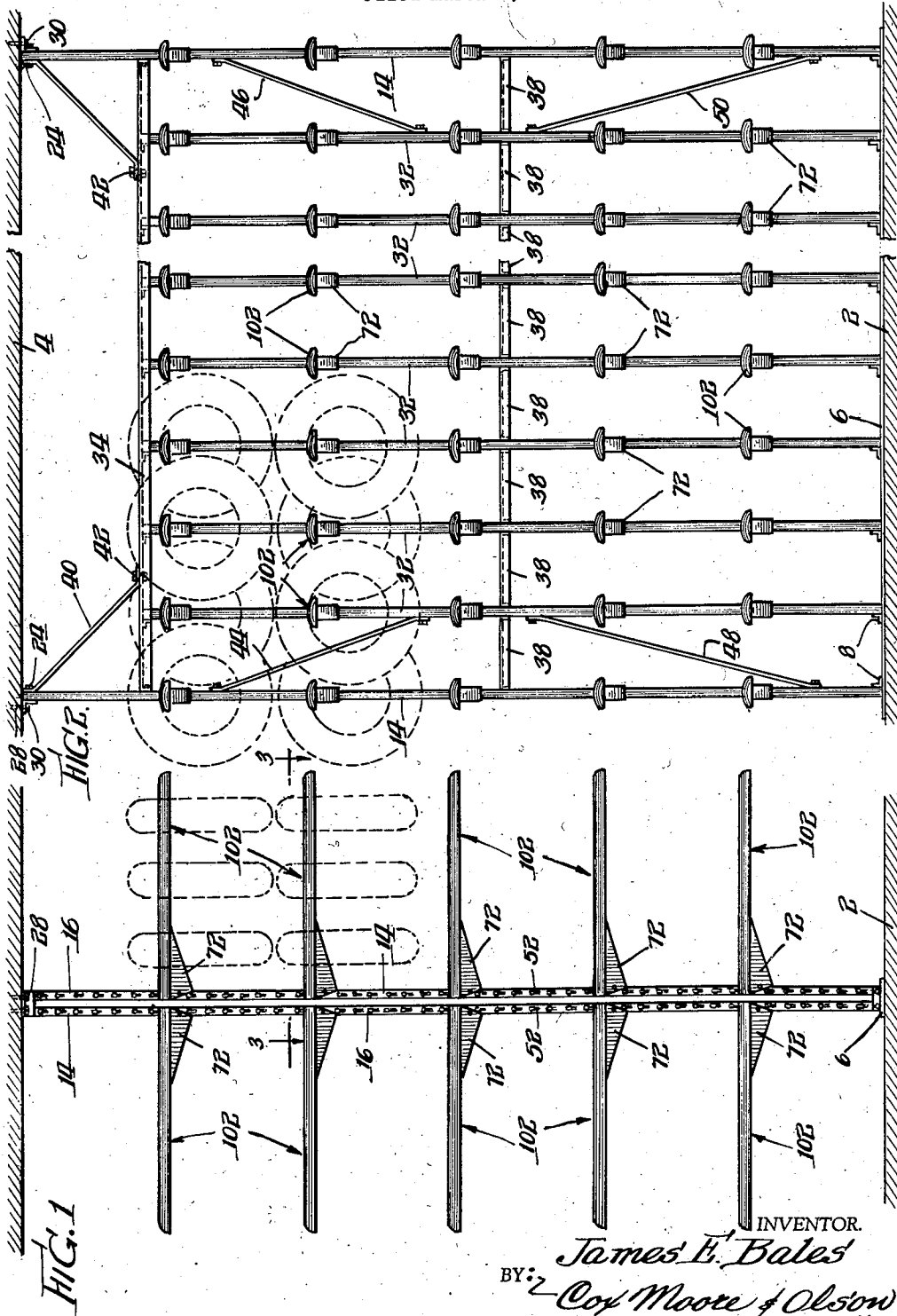
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STORAGE RACK FOR GREEN TIRES AND OTHER ARTICLES

Filed March 5, 1941

3 Sheets-Sheet 1



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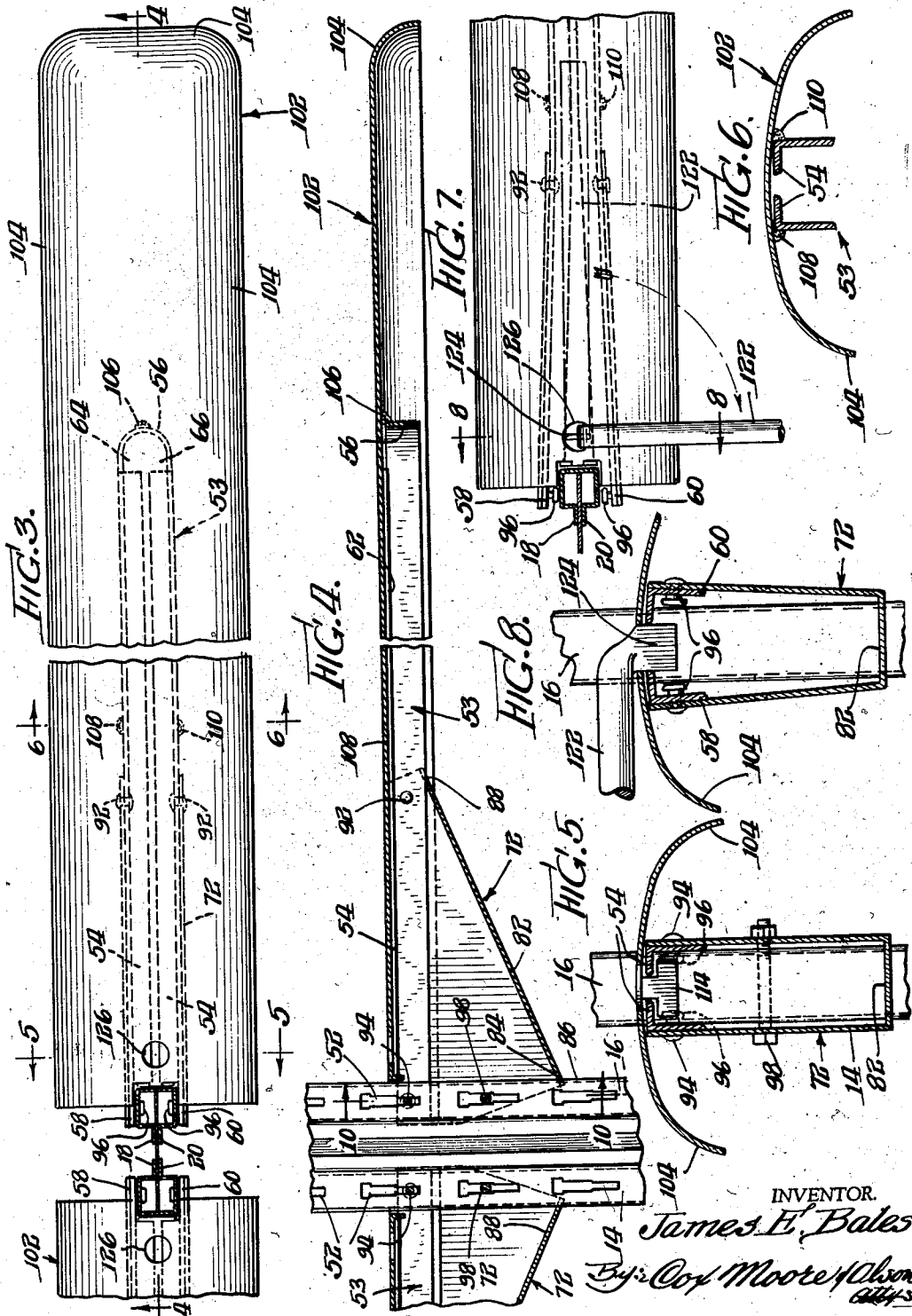
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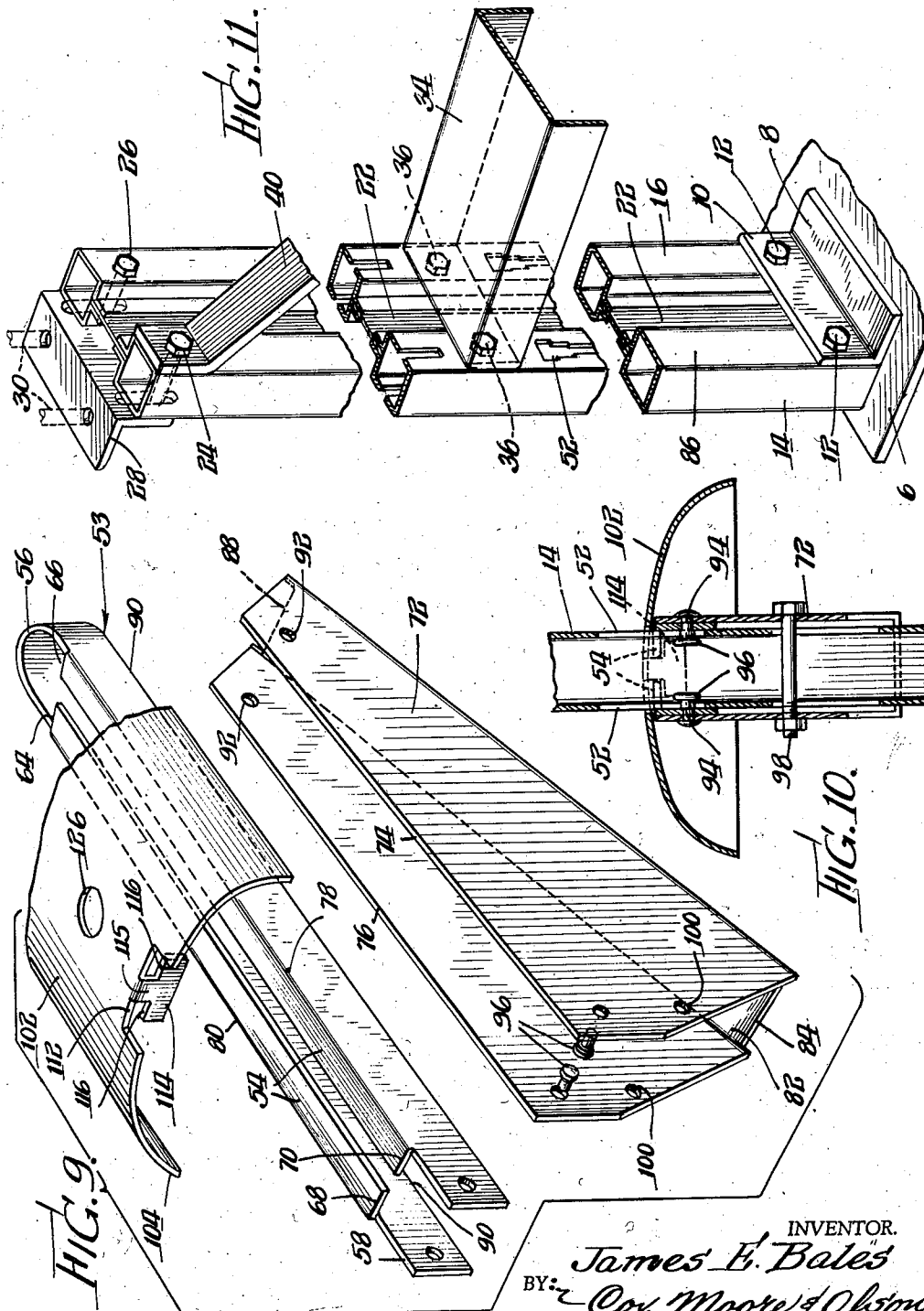
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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,306,540

STORAGE RACK FOR GREEN TIRES AND
OTHER ARTICLESJames E. Bales, Aurora, Ill., assignor to Lyon
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corporation of Illinois

Application March 5, 1941, Serial No. 381,820

8 Claims. (Cl. 211—23)

This invention relates to a rack construction for storing green tires, and among the objects of the invention are to provide a rack for storing automobile green tires, which will permit the tires or the like to be located in easy accessible position, requiring the minimum of floor space both when the tires are in stored position, or when the racks are empty; to provide a strong and sturdy rack construction comprising a skeleton supporting frame work adapted to be arranged centrally in the assembled structure and carrying vertically adjustable arms extending outwardly, each arm separately supporting a tire storing shelf formed of sheet metal and fastened to the arm in a manner to permit disengagement of the arm and its shelf from the skeleton structure; to provide a rack of the above described type, including the provision of knock-down characteristics, possessing the foregoing advantages, and which may be readily and cheaply manufactured, easily assembled by inexperienced labor, and which may readily again be taken apart and reassembled; to provide a novel construction and arrangement of mounting and connecting individual sheet metal shelves to individual angle iron strips folded upon themselves, and wherein the sheet metal shelf is welded at its outer ends to the angle strip, and wherein the metal shelf is provided at its inner end with a disengageable tang adapted interlockingly to engage the opposed undersides of the angle iron when the latter is secured in position to the skeleton frame, and wherein the sheet metal shelf construction permits disengagement of the angle iron from the skeleton frame; to provide these and other objects of the invention as will be apparent from a perusal of the following specification when taken in connection with the accompanying drawings, wherein—

Figure 1 is an end elevational view of the improved rack;

Figure 2 is a front elevational view thereof;

Figure 3 is a plan sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a vertical, sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a cross-sectional view taken on the line 5—5 of Figure 3;

Figure 6 is a cross-sectional view taken on the line 6—6 of Figure 3;

Figure 7 is a fragmentary plan sectional view of the device, showing the manner and method of applying a tool in the process of assembling the device;

Figure 8 is a cross-sectional view taken on the line 8—8 of Figure 7;

Figure 9 is a perspective view of the parts that go to make up one supporting rack or cantilever arm;

Figure 10 is a cross-sectional view taken on the line 10—10 of Figure 4; and

Figure 11 is a perspective view of the upright frame member and its associated braces and struts.

For the purpose of illustrating the invention, it is shown as a modification or improvement on the patents to Walter N. Vance, No. 1,560,122 issued November 3, 1925, and No. 1,620,841 issued March 15, 1927.

The invention in the present construction possesses a number of novel features not disclosed in the prior mentioned patents, and it is to these features that the claims of the present invention are directed.

The rack is preferably of a construction adapted to be installed between the floor 2 and ceiling 4 of any desired storage space. Generally, the rack comprises a relatively elongated base plate 6, to which a plurality of spaced apart angularly arranged clamps 8 are fastened each such clamp having an upstanding flange 10 adapted to receive bolts 12. These bolts, in turn, secure a pair of hollow vertical posts 14 and 16 in rigid upright position. Each one of these posts is formed of sheet metal of relatively heavy gauge stock bent upon itself to form a hollow, rectangular construction with the opposed ends 18 and 20 extending vertically and juxtaposed. The two posts 14 and 16 are exactly alike so that the flange portions 18 and 20 face each other and receive therebetween a sheet metal strip 22, which may be secured between the posts by welding or in any desired manner, whereby to form a vertically extending rigid post construction, which projects upwardly to the ceiling 4. At the top the posts 14 and 16 receive bolts 24 and 26 which engage an outer angle clamp or plate 28, in turn bolted as at 30 to the ceiling member 4. In addition to the two exterior posts 14 and 16, which extend full length from the floor to the ceiling, there is provided a plurality of intermediate spaced apart posts 32 which are identical in construction and are fastened to the base strip 6 by identical angle iron clamps 8. These intermediate posts, however, extend short of the ceiling 4, but at the top are bolted or welded to a horizontally extending cross brace 34, which is bolted as at 36 at each end to the outermost vertical hollow posts 14 and 16 (see Figure 11).

In addition, there is, if desired, a series of lower horizontal cross braces 38 which are bolted to pairs of adjacent vertical posts 14 and 32, whereby to provide rigidity. So also, there are used a number of diagonally extending struts. An uppermost strut 40, which is bolted by means of the bolt 24 to the outermost posts 14 and by the bolt 42 to the top horizontal cross brace 34. In addition, there are other diagonal struts 44, 46, 48, and 50, which are bolted between the outermost vertical posts 14 and the next adjacent vertical posts 32. These diagonal struts lie in vertical planes, and firmly and simply rigidify the entire skeleton frame work.

From an inspection of Figures 1 and 4, it is to be seen that the vertical posts 14 and 16 and the intermediate posts 32 are provided with a series of vertically disposed, spaced apart bayonet slots 52, which slots are arranged with the head portion uppermost, so that, when a pin or tang is inserted in the wider space at the head, the tang may be forced downwardly to be firmly lodged within the narrower throat of the bayonet slot in a well known manner. By reason of these vertically spaced slots, various spaced apart adjustments to the cantilever shelf members (hereinafter described) are provided.

A plurality of oppositely extending, spaced apart, adjustable cantilever shelf supports 53 are provided, each of which comprises an elongated, angular strip 54 (see Figure 9), which is bent at the middle upon itself to provide an outer rounded end 56 and two spaced apart ends 58 and 60. The metal of the horizontal flange 54 of this angle iron stop 52 is cut away as at 64 and 66 at the outer end and at 68 and 70 at the inner end. In addition, each one of these cantilever arms or supports includes a sheet metal brace and covering 72, generally in the form shown in Figure 9, which is arranged so that the upper edges 74 and 76, as shown in Figure 5, lie flush with the upper edges 78 and 80 of the angle arm 54. This supporting member 72 is provided with a diagonally inclined undersurface 82, which at its lower edge constitutes a relatively broad bearing 84 adapted to engage the sides 86 of the vertical posts 14, 16, and 32; and, in addition, the member 72 is provided with an outer edge 88 (see Figure 4) which engages the lower edges 90 of the angle arms 53.

As shown in Figure 4, the outer end of this sheet metal member 72 is riveted as at 92 to each side of the angle arm 53, and at its innermost end is riveted as at 94 to the innermost ends of the angle arm 54. In this connection each one of these rivets 94 is provided with a large head or tang 96 which is adapted to enter the wider, upper portion of the bayonet slots 52.

In addition, a bolt or pin 98 is adapted to pass through registering holes 100 in the lower portion of the member 72, as shown in Figure 5, for the purpose hereinafter described. This bolt likewise passes through the head or wider portions of the immediately beneath bayonet slots formed in the vertically extending posts 14 and 16.

Each such cantilever arm thus extending outwardly from the vertical posts is arranged to support an elongated, relatively narrow individual shelf 102 formed of sheet metal. These shelves are shown in Figures 3 and 4 and, as formed, extend considerably beyond the rounded or folded end 56 of the beneath angle iron. Each such sheet metal shelf 102 is preferably curved downwardly as at 104 at its outer end and along its two longitudinal sides so as to provide a

smooth, downwardly curving upper green tire supporting surface. Each one of these shelves 102 is welded as at 106 to the curved portion of the beneath angle iron, and is, likewise, welded as at 108 and 110 to these semi-angle irons in the manner shown in Figures 3 and 6, whereby the outermost end portion of each of these sheet metal shelves is rigidly connected and welded to the under supporting angle iron.

At the same time means is provided whereby each angle iron 53 and its overlying imperforate sheet metal shelf 102 may be attached to or dismantled from the vertically extending posts, and while also the inner end of the overlying sheet metal shelf may be rigidly held down upon the beneath, underlying supporting angle iron. To this end, the inner end of each shelf 102 is slotted as at 112 to provide a bent-down tang 114 having shoulders 116. The neck 115 of this tang 114, as shown more clearly in Figure 5, is adapted to lie between the opposed longitudinal edges 118 and 120 of the upwardly extending arms of the angle iron 53 and the shoulders 116 thereof, thereby underlying the horizontal spaced apart flanges of this angle iron, whereby the innermost end of each shelf member is held snugly down upon the inner end of the angle iron construction by means of these tangs.

At the same time this construction will permit the two innermost ends of the arms 53 to be shifted outwardly whereby to disengage the tangs 96 carried by each one of these arms out of the upper ends of the bayonet slots 52 in the manner shown in Figure 8, and this is accomplished by removing the bolt 98 and inserting a tool 122 which has an angularly disposed operating head 124 through the aperture 126 in the top of the shelf 102 at its innermost end. When this tool is properly inserted by giving a ninety degree turn, it will force apart the innermost ends 118 and 120 of the arms 54, whereby to spread tangs 96 outwardly and away from the slots 52, whereby the entire cantilever arm construction with its connected shelf 102 may be dismantled or removed from the vertical hollow posts, and in a similar manner whereby each one of these arms may be assembled in adjustable position to the hollow posts, when desired.

By reason of the foregoing construction, it will be appreciated that each cantilever arm has rigidly and permanently connected thereto its individual, elongated sheet metal shelf construction which is connected in such a way, so that, while the sheet metal shelf is permanently united to the underlying angle supporting arms 54, it still permits these angle irons to be spread apart so as to permit practically instant installation of the cantilever and shelf to the vertical supports, or permits their removal therethrough, and this is accomplished by inserting the parting tool through the only aperture of the sheet metal shelf to permit dismantling in a minimum of time and with facility. Thus, there is provided a very simple, rugged, compact shelf construction possessing the inherent characteristics hereinafore described.

Changes may be made in the form, construction, and arrangement of the several parts without departing from the spirit of the invention or sacrificing any of its numerous advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

Having thus described my invention, what I

claim as new and desire to secure by Letters Patent is:

1. In a shelf or storage rack, the combination of a base support and a top support, two spaced outermost vertical posts each fixed at its upper and lower ends to the lower and upper supports, respectively, a plurality of relatively shorter vertical posts disposed in spaced vertical arrangement between said outermost posts, an upper cross brace disposed horizontally between said spaced outermost posts and having its opposite ends connected to said outermost posts, diagonally disposed struts connected at their upper ends to the top portion of each outermost vertical post, the bottom end of each strut being connected to the outermost portions of the upper cross brace, intermediate relatively short horizontally disposed cross braces interconnecting opposed portions of the intermediate posts, additional diagonal struts interconnecting the outermost vertical posts and the next adjacent intermediate vertical posts, and cantilever arms extending outwardly from opposite sides of each vertical post, and shelves carried by said cantilever arms.

2. The combination of a plurality of spaced apart vertically disposed posts each having vertically spaced arm attaching means, cantilever arms extending out from said posts each having a pair of resilient inner free ends spaced apart and having means thereon adapted to engage said arm attaching means on said posts and to be held connected thereto by the resilience of the free ends, a substantially imperforate sheet metal shelf overlying said arm and welded at portions relatively remote from its inner end to the outer portion of said arm, the inner end of said sheet metal member being disconnected from the inner portions of the free ends of said arm, said sheet metal member having an aperture adjacent its inner end to permit the insertion of a tool therethrough between spaced apart inner free ends of said arms, whereby to force the same apart to release the fastening means on said free ends from said attaching means on said posts.

3. In a device of the class described in combination with a plurality of vertically disposed posts having spaced apart fastening means vertically disposed thereon, a plurality of cantilever arms each comprising opposed inner spring metal free end portions spaced apart and each free end having fastening means thereon adapted, when said ends are relatively closely adjacent each other, lockingly to engage with said corresponding fastening means on said posts whereby to hold said arms rigidly in position on said posts, a sheet metal shelf member permanently connected to the outer portion of said cantilever arm, the inner portions of said cantilever arms being capable of substantial movement toward and from each other and relatively to said shelf, and said sheet metal shelf being constructed to permit the insertion of a tool between the opposed spaced apart portions of the cantilever arm to cause the same to be wedged apart to release the fastening means of said arm from the cooperative fastening means on the post.

4. In a device of the character described in combination with means providing a vertical post having spaced apart bayonet slots vertically disposed thereon, a cantilever arm comprising a length of angle iron metal bent upon itself to provide a doubled outer portion having two relatively parallel free arms the inner portions of

which lie in spaced apart relatively close juxtaposition, the opposed faces of the ends of the free arms each being provided with a head adapted to enter the wider portion of a bayonet slot under the spring metal influence of said free arms to move toward each other whereby to hold said heads in said slots, and a substantially imperforate sheet metal shelf welded at a portion relatively remote from its inner end to said cantilever arm, the inner ends of said shelf and arms being free of interconnecting welded portions, the inner end of said sheet metal shelf having a downwardly projecting tang formed with lateral shoulders, said tang depending through the space between the opposed faces of the free ends of the arm member and underlying portions thereof, said sheet metal member having an opening permitting the insertion of a tool between the opposed spaced edges of said free arms to permit the arms to be wedged apart whereby said heads are released from said bayonet slots, said lateral shoulders on said tang being sufficient in extent to allow the spreading movement of said free ends without disengaging said depending shoulder from the overlying portions of said free ends.

5. In a device of the class described in combination with a vertical post having a series of vertically opposed, spaced apart bayonet slots, an angle iron having a horizontal flange, said iron being folded upon itself to provide a bent, outer portion and two parallelly disposed legs spaced apart between the horizontal flanges, the free ends of said angle iron each having a fastening member provided with a head adapted to enter the opposed bayonet slots on said posts, whereby to hold said angle iron in outwardly extending position relative to said post, a sheet metal shelf member rigidly connected to the bent outer portion of said angle iron leaving the inner ends of said angle iron free to move toward and from each other, said sheet metal shelf having means for permitting the insertion of a tool between said free ends of said horizontal flanges of said angle iron for spreading the same apart to release the fastening means of the free ends of said angle iron from said bayonet slots.

6. A rack comprising spaced uprights, supporting arms engaged therewith and extending laterally therefrom, each of said arms comprising a metal member with its outer end bent in looped formation to provide two relatively parallel legs, said legs having inherent resilience operating to maintain themselves in parallel relatively close-together yet spaced-apart position, each of the free ends of said legs having fastening means and said upright having cooperative fastening means adapted to engage by means of the resiliency of the legs with the fastening means of each leg when said said arms are in substantially parallel position, whereby detachably to hold said arm in lateral, substantially horizontal position with respect to said upright, and a sheet metal shelf-like member overlying and enclosing the top portion of the arm throughout its length and means for permanently connecting said sheet metal shelf-like member to said arm in a manner to allow lateral inward and outward movement of said arms with respect to each other to permit the fastening means thereon to disengage from the fastening means of said post.

7. In a shelf or rack construction, the combination of a number of uprights, cantilever arms extending out therefrom and each consisting of a metal member returned upon itself providing a pair of normally substantially parallel legs hav-

ing inherent resilience for movement in a substantially horizontal plane toward and from each other, said upright and the free ends of said legs having cooperative fastening means for securing said leg members to an appropriate upright when said legs are substantially parallel and a sheet metal shelf member extending substantially from the inner end of said legs outwardly well beyond the folded end of said arm and covering said arm, means for securing said shelf member permanently to each leg at points relatively remote from the inner ends of said legs, and means for securing the inner end of said shelf member detachably to the inner ends of said legs, said last mentioned means allowing relative lateral movement of said legs to allow the detachment of said arm from said upright.

8. In a shelf or rack construction, the combination of a number of uprights, cantilever arms extending out therefrom and each consisting of a metal member returned upon itself providing a pair of normally substantially parallel legs having inherent resilience for movement in a sub-

stantially horizontal plane toward and from each other, each upright and the free ends of said legs having cooperative fastening means for securing said leg members to said upright when said legs are in substantial parallelism, and a sheet metal shelf member extending substantially from the inner end of said legs outwardly well beyond the folded end of said member and covering the same, means for securing said shelf member permanently to each leg at points relatively remote from the inner ends of said legs, and means for securing the inner end of said shelf member detachably to the inner ends of said legs, said last mentioned means allowing relative lateral movement of said legs to allow the detachment of said arm from said upright, and a sheet metal housing surrounding the underside of the inner ends of said legs, said housing having upper free ends permanently attached to the sides of the innermost ends of said legs, said housing engaging the undersides of said legs and the vertical sides of said uprights.

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