Dec. 15, 1959 G. D. STOUGH 2,917,261

PORTABLE ADJUSTABLE RACK

Filed Dec. 9, 1954 3 Sheets-Sheet 1

FIG. 1

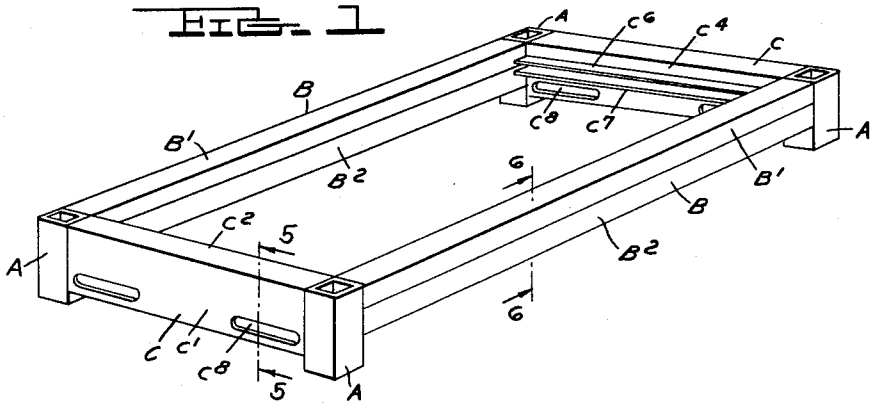


FIG. 6

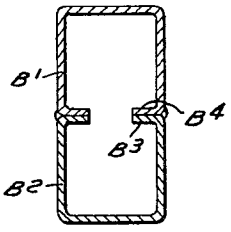
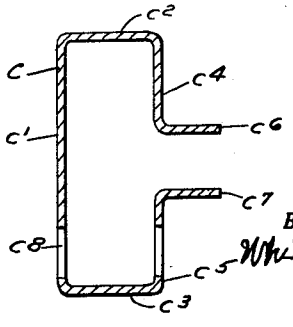


FIG. 2

FIG. 5



INVENTOR.
GERALD D. STOUGH
BY
Whittemore Hulbert & Belknap
ATTORNEYS

Dec. 15, 1959 G. D. STOUGH 2,917,261

PORTABLE ADJUSTABLE RACK

Filed Dec. 9, 1954 3 Sheets-Sheet 2

FIG. 3

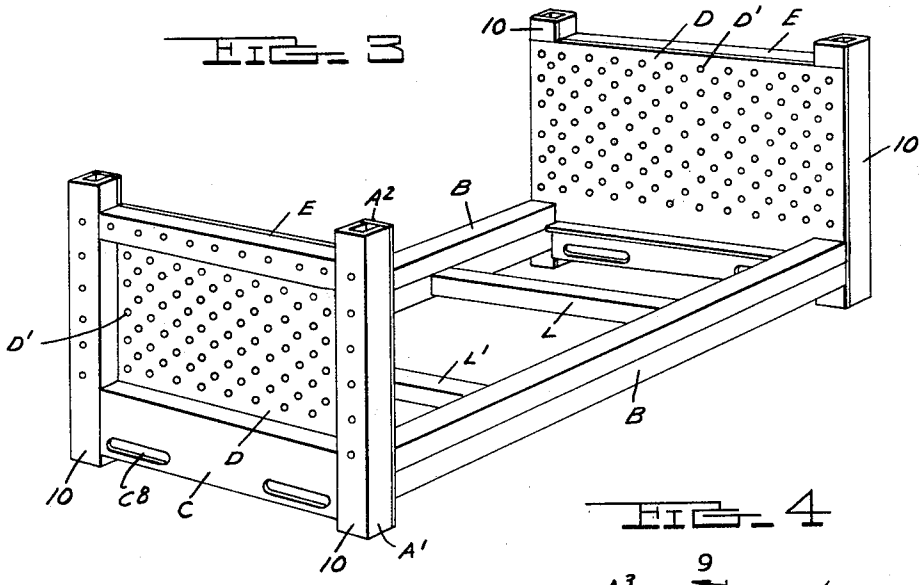


FIG. 4

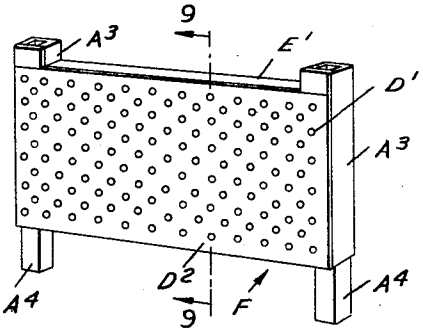


FIG. 7

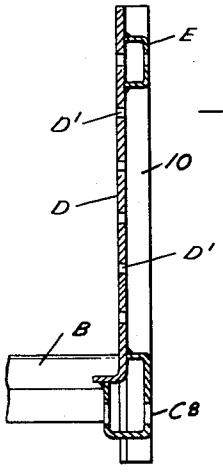


FIG. 9

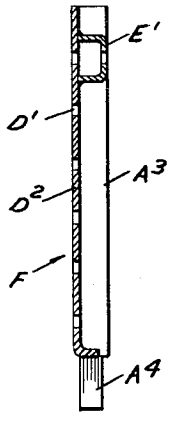
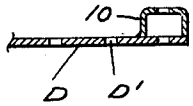


FIG. 8



INVENTOR.
GERALD D. STOUGH
BY
Whittemore Halbert & Belknap
ATTORNEYS

Dec. 15, 1959 G. D. STOUGH 2,917,261

PORTABLE ADJUSTABLE RACK

Filed Dec. 9, 1954 3 Sheets-Sheet 3

FIG. 10

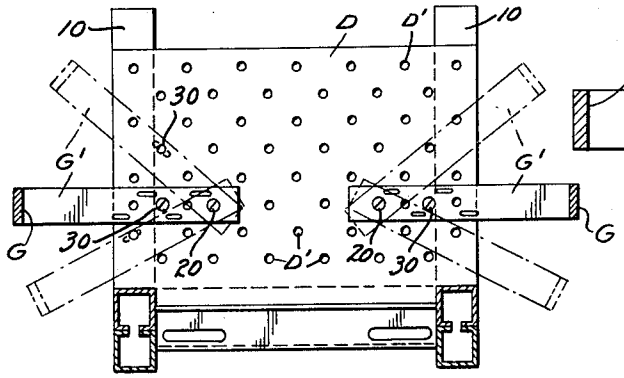


FIG. 11

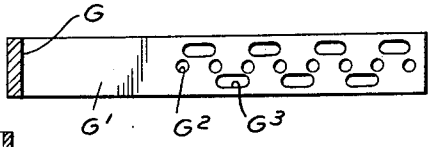
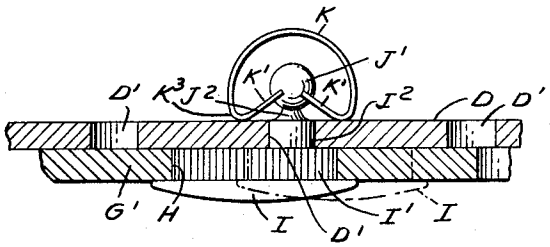
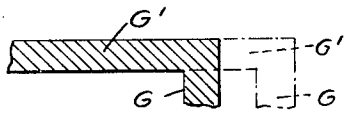


FIG. 13





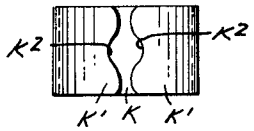
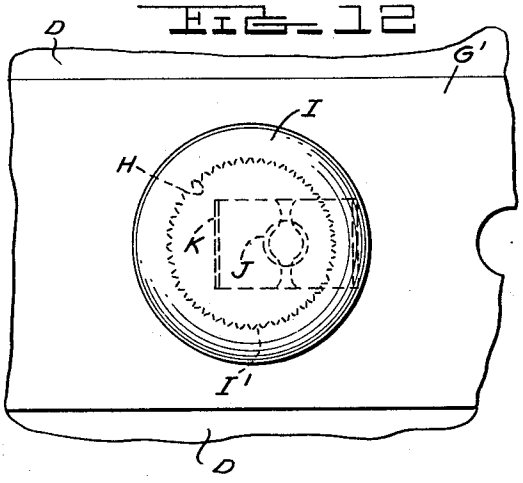


FIG. 14

FIG. 12



INVENTOR.

GERALD D. STOUGH

BY

Whittemore Hulbert & Belknap

ATTORNEYS

United States Patent Office 2,917,261 Patented Dec. 15, 1959

2,917,261

PORTABLE ADJUSTABLE RACK

Gerald D. Stough, Detroit, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich., a corporation of Michigan

Application December 9, 1954, Serial No. 474,134

7 Claims. (Cl. 248—120)

This invention relates generally to racks and refers more particularly to a portable load carrying rack for supporting a load of merchandise during transportation thereof, or while in storage.

An object of the invention is to provide a rack having dimensional relations to the storage space within a transport vehicle, so that all available storage space in such transport vehicle may be utilized for the reception of such racks.

Another object is to obtain a construction of sufficient strength and rigidity to take care of all stresses developed therein incident to its load.

Another object is to obtain a construction which can be manufactured at relatively low cost and will have a long life.

With these objects in view, the invention consists in the construction as hereinafter set forth.

In the accompanying drawings:

Fig. 1 is a perspective view of a rack embodying my invention.

Fig. 2 is a perspective view of a modified form of rack.

Fig. 3 is a perspective view of another modified form of rack.

Fig. 4 is a perspective view of a separate end unit attachable to the posts of the rack shown in Fig. 1.

Fig. 5 is an enlarged cross sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is an enlarged cross sectional view taken on line 6—6 of Fig. 1.

Fig. 7 is a vertical sectional view taken on line 7—7 of Fig. 2.

Fig. 8 is a cross sectional view taken on line 8—8 of Fig. 2.

Fig. 9 is a vertical sectional view taken on line 9—9 of Fig. 4.

Fig. 10 is a vertical sectional view through the main frame of the rack shown in Fig. 3, and showing two outrigger frames attached to an apertured plate D at one end of said rack.

Fig. 11 is a vertical sectional view through one of the supporting bars illustrated in Fig. 10.

Fig. 12 is an enlarged fragmentary elevational view of one of the supporting bars and adjacent apertured plate D, and showing a modified form of attaching means.

Fig. 13 is a horizontal sectional view through the construction shown in Fig. 12, and showing by dotted lines an adjusted position of the bolt I and of one of the arms G'.

Fig. 14 is a plan view of the open side of the member K.

Generally described, the rack comprises a horizontaly extending substantially rectangular main frame having posts at its four corners, and horizontal bars extending between and secured to said posts. The frame may be made of any suitable material dependent upon the load which it is designed to carry, but preferably such frame is formed of tubular metallic members rigidly secured to

each other by welding. As shown in Fig. 1, A are tubular posts arranged at the four corners, B are tubular side bars, and C are tubular end bars. The length of the side bars B is selected with respect to the storage space as, for instance, the internal width of a freight car. The end bars C are shorter to reduce the space between the side bars B on which the load is chiefly supported. Each side bar B comprises a pair of channel members B', B^2 that open toward each other and are provided at their opposed edges with inturned flanges B^3 and B^4 that are disposed in surface to surface engagement with each other and are welded together. The end bars C may be similarly formed, or as shown in Fig. 5, each may be a single member having a vertical side C', top and bottom sides C^2, C^3, opposite inturned portions C^4, C^5 and spaced horizontally extending flanges C^6 and C^7. The flanges C^6 and C^7 are arranged on the inner sides of the bars and may be used for holding therebetween a floor or other load carrying member.

The frame thus far described might be used for supporting certain merchandise capable of attachment thereto, but preferably there is an upward extension at one or both ends of the frame. This may be formed as shown in Figs. 2, 3 and 7 by attaching upright plates D to posts **10** of the desired height. Such plates D may be provided with a multiplicity of apertures D' for engagement by load securing means. A horizontal bar E, which also may be a channel bar, extends between the posts **10** near their upper ends and is secured to each plate D. If desired, each upward extension at an end of the frame may be a separate attachable unit F, as shown in Figs. 4 and 9. This includes a pair of post sections A^3 having downward extensions A^4 of reduced cross section adapted to telescopically engage the posts A, and apertured plate D^2 similar to the plate D, and a bar E' extending between the post sections A^3 and secured to said post sections A^3 and plate D^2. The end bars C of the main frame are preferably of greater depth than the side bars B, and the latter are spaced sufficiently above the lower ends of the posts for introduction therebenenath of the forks of a lift truck. If the space beneath the bars B is insufficient to receive said forks, slots C^8 may be formed in the bars C to receive the same.

The apertured plate D at one or both ends of the main frame may be used for directly securing certain portions of the load, or these plates may be used for erecting outrigger frames for securing on said rack a load having a transverse dimension greater than the width of the main frame. Each outrigger frame may include a bar G which extends the length of the main frame and has at its opposite ends supporting arms G' secured to the plates D or D^2. The arms G' may be provided with rows of longitudinally spaced apertures therein, some of which, G^2, may be round while others, G^3, are elongated slots. These apertures in connection with the apertures in the plate D or D^2 permit the arms G' to be bolted to said plates so as to position the outrigger bar G as desired. Thus, the arms G' may extend out horizontally from the plates, or if the nature of the load to be supported required it, they may be secured to extend at various angles. Securing of these arms at different angles is facilitated by the provision of the slots G^3 as well as the round apertures G^2 in said arms. Thus, an arm G' arranged at the desired angle may be attached to the plate D or D^2 by a pivot bolt **20** passing through registering apertures in the arm and the plate, and to hold the arm at this angle a second bolt **30** is engaged with the arm and plate. One of the slots G^3 will be found to register some portion thereof with an aperture in the plate D or D^2 to receive this second bolt **30** at the desired angle of the arm.

The position of each outrigger frame is limited by the spacing between the apertures D' in the plates D and D^2.

To obtain a more exact positioning I have provided means for increasing or diminishing the extension of the arms G′ from the point of attachment to the apertured plate D or D^2. Thus each arm G′ may be provided at one or more points with an internally toothed or serrated aperture H, as shown in Figs. 12 and 13. A headed bolt I is provided with a correspondingly externally toothed or serrated portion I′ for engaging the aperture H in rotatively adjustable positions therein. The shank I^2 of the bolt I is engaged with an aperture D′ of the plate and is eccentric to the axis of the serrated portion I′. Consequently the rotative adjustment of the serrated portion I′ in the arm G′ will move said arm axially with respect to the position of the shank I^2 in the plate. The amount of adjustment may be equal to the spacing between apertures D′ in the plate and this will permit of exactly positioning the outrigger frame to be positioned exactly as desired. It is to be understood that in addition to this point of attachment between the arm G^1 and the apertured plate D or D^2 a second bolt such as **30** connects these members at a spaced point from the first to hold the arm against angular movement.

Instead of using a threaded bolt and a nut for securing the attachable members, such as the arms G^1, it may be preferable to use snap-fasteners which can be secured in much less time. Fig. 13 discloses such a fastener which comprises a bolt I having a spherical portion J′ connected to the shank I^2 by a neck portion J^2 of smaller diameter. Cooperating with this bolt is an arcuate resilient member K having opposite return bent portions K′ with notched ends K^2. By pressing on the arcuate portion of this member K the notched ends K^2 can be forced over the spherical portion J′ to engage the neck portion J^2 and this will also bring the curved portions K^3 against the plate D so as to retain the bolt against detachment therefrom. Any stresses in the bolt I tending to withdraw the same will only increase the clamping action of the portions K′. However, whenever it is desired to remove the member K, the arcuate portion thereof may be pressed toward the plate D to expand or move outward the portions K′ until they are released from the spherical portion J′.

While the rack, as illustrated in Figs. 1, 2 and 3, has an open main frame, it is to be understood that a floor may be mounted on the frame if needed for supporting the merchandise. Also, as illustrated in Fig. 3, the frame of the rack may be provided with intermediate cross bars L, L′.

What I claim as my invention is:

1. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having removable portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, said upright plates being provided with a multiplicity of spaced apertures, and two adjustable outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outwardly beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms at the outer ends thereof, said arms being substantially parallel to said upright plates, each of said arms having adjacent their inner ends two spaced apertures in registration with two selected apertures in each of said upright plates, and securing means for said arms engaging the registering apertures in said arms and said plates, the securing means for said arms including a pivot element and a retaining element respectively engaging the spaced apertures in each arm and engageable successively with the selected apertures in said upright plates, whereby each outrigger frame initially may be swung vertically in the arc of a circle about said pivot elements to a desired position, and thereafter may be held in such position by said retaining elements.

2. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, said upright plates being provided with a multiplicity of spaced apertures, and two adjustable outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms at the outer ends thereof, said arms being substantially parallel to said upright plates, each of said arms having adjacent their inner ends two spaced apertures in registration with two selected apertures in each of said upright plates, and means connecting said arms to said upright plates, including means engaging the registering apertures in said arms and said plates.

3. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, and two adjustable outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally ex-

tending frame and connected to said arms, said arms being substantially parallel to said upright plates and detachably connected thereto.

4. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, and two outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame and movable vertically relative to said upright plates to various elevations relative to said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms, said arms being substantially parallel to said upright plates, and removable fasteners detachably connecting said arms to said upright plates at a predetermined elevation relative to said horizontally extending frame.

5. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, said upright plates being provided with a multiplicity of spaced apertures, and two removable outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms, said arms being substantially parallel to said upright plates, each of said arms having two spaced apertures in registration with two selected apertures in each of said upright plates, and means detachably connecting said arms to said upright plates, including separate elements respectively engaging the registering apertures in said arms and said upright plates.

6. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, said upright plates being provided with a multiplicity of spaced apertures, and two outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms, said arms being substantially parallel to said upright plates, and means detachably connecting said arms to said upright plates, including means engaging said arms at longitudinally spaced points thereof and engaging selected apertures in said upright plates.

7. A portable industrial rack for carrying a load of merchandise thereon during transportation and storage; comprising an elongated horizontally extending frame upon which merchandise may be loaded, two pairs of load sustaining upright posts respectively connected to said horizontally extending frame at opposite ends thereof for engagement with load sustaining floors respectively of a transport vehicle and a storage chamber, the posts of each pair being spaced transversely apart at each end of said horizontally extending frame and having portions projecting upwardly above said horizontally extending frame, and means for holding on said rack a load having a transverse dimension greater than the width of said horizontally extending frame, including two upright plates respectively above and extending transversely of said horizontally extending frame at opposite ends thereof, each of said plates bridging and connected to the upwardly projecting portions of each pair of posts at each end of said horizontally extending frame, and two removable outrigger frames respectively at opposite longitudinal sides of said horizontally extending frame, each of said outrigger frames including two arms extending transversely of and laterally beyond a longitudinal side of said horizontally extending frame, and a bar located outward beyond and extending longitudinally of a longitudinal side of said horizontally extending frame and connected to said arms, said arms being substantially parallel to said upright plates, and adjustable means detachably connecting said arms to said upright plates.

References Cited in the file of this patent

UNITED STATES PATENTS

1,021,432	Smith	Mar. 26, 1912
1,554,011	Lehman	Sept. 15, 1925
2,359,406	Crosser	Oct. 3, 1944
2,497,453	Hazen	Feb. 14, 1950
2,579,655	Donald	Dec. 25, 1951
2,600,096	Cooper et al.	June 10, 1952
2,733,828	Averill	Feb. 7, 1956

FOREIGN PATENTS

98,386	Sweden	Mar. 19, 1940
135,509	Australia	Nov. 29, 1949
612,538	Great Britain	Nov. 15, 1948
749,479	France	May 8, 1933