F. J. MEAD.

GREENHOUSE BENCH.

APPLICATION FILED JULY 9, 1917.

1,296,684. Patented Mar. 11, 1919.

Fig. 2

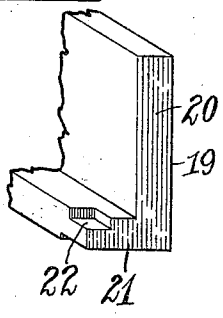


Fig. 3

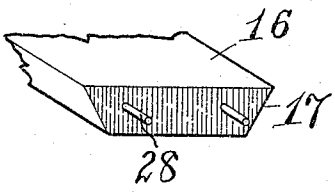


Fig. 4

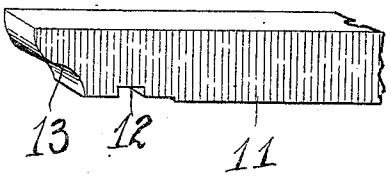


Fig. 1

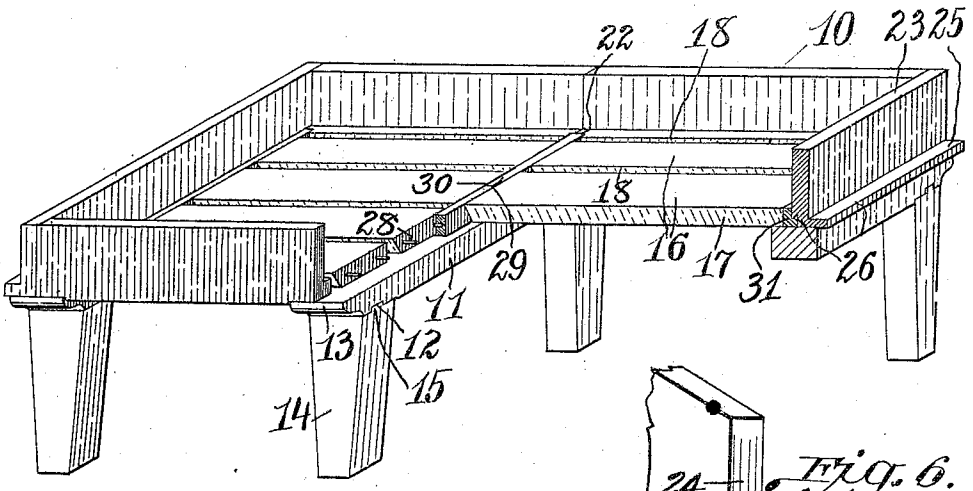


Fig. 6.

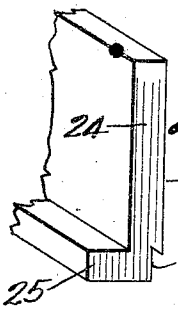
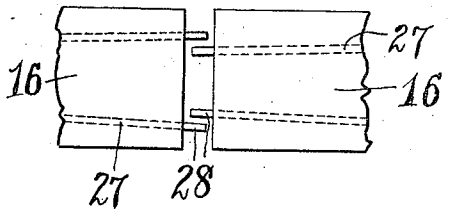


Fig. 5



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GREENHOUSE-BENCH.

1,296,684. Specification of Letters Patent. Patented Mar. 11, 1919.

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To all whom it may concern:

Be it known that I, FRED J. MEAD, a citizen of the United States, and a resident of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Greenhouse-Benches, of which the following is a specification.

My invention relates to greenhouse benches for containing earth in which plants and flowers are grown.

Among the objects of the invention is the provision of a greenhouse bench of reinforced concrete made up in sections in such manner that the work of making the sections and assembling them can be readily carried on by ordinary labor such as is available in greenhouses, and there is no necessity for the use of expensive and highly skilled workmen.

The invention further consists in the improvement of devices of this character in numerous important particulars, and with the foregoing and related objects in view, my invention consists in the construction, parts, improvements and combinations herein set forth and claimed.

It has been necessary heretofore in constructing concrete benches for greenhouses to make use of expensive forms whereby the complete benches may be made *in situ* in reinforced concrete, necessitating substantial discontinuance of plant growing in the house or houses which are to be supplied with benches for a considerable interval, the space being first cleared, then a considerable time being required for the setting up of the forms for the concrete work and a further time being required for the actual performance of the concrete, and a still further time being required to elapse before the concrete is dry and hard and in condition to sustain the weight of the earth which must be placed thereon before the growing of flowers and the like can be resumed. Also in putting in concrete benches in this way highly skilled labor is essential in order to secure benches of satisfactory construction which will be durable and serve efficiently the purpose for which they are intended.

Greenhouse work is seasonal work, and frequently there are times when the workmen about the greenhouse can be economically engaged in the construction of benches, but heretofore, so far as I am aware, in order to utilize the spare labor available about the greenhouse for the purpose of constructing benches, it has been necessary to construct the benches of material which can be easily worked, such as wood, which, however, is not adapted for the construction of benches of a strong, substantial and lasting character.

According to the present invention a greenhouse bench is built up of easily constructed units which can be made at any time in spare hours by ordinary labor available about the greenhouse and which may be cured and hardened ready for use and may be simply and readily assembled without the necessity of any skilled workmanship, all that is required being to place the parts in proper relative relation and preferably to fill the openings left for that purpose with a proper binding material, such as cement mortar. With units completed ready for assembly and dried and hardened and ready to be put together, there is no occasion for putting any part of the greenhouse out of use for any considerable period, but the new benches can be put in place substantially as the old benches are removed and be ready and available for use within a very short time.

In the accompanying drawings I have illustrated one form of greenhouse bench embodying my invention and the several sections which go to make up the bench when assembled together, but it is to be understood that the same are presented only for the purpose of affording a clear understanding of my invention and that the same is not limited thereto but is of the scope defined by my claims.

In said drawings Figure 1 is a view in perspective, with parts broken away, of a greenhouse bench made up of assembled units of concrete. Figs. 2, 3 and 4 are perspective views, with parts broken away, of a side member, a floor member and a supporting beam, respectively. Fig. 5 is a plan view, with parts broken away, showing the relative arrangement of two floor sections placed in alinement with one another. Fig. 6 is a perspective view, with parts broken away, showing one end of an end member for the benches.

Benches in accordance with the invention may be made of any length. In Fig. 1 I have illustrated, for convenience of showing, a bench which is two sections in length.

In said Fig. 1, reference numeral 10 is applied to designate the bench generally. 11 indicates cross beams which are preferably formed with notches 12 near their ends and may have their outer ends of any form. Preferably the ends of the cross beams 11 are made of ogee form, as illustrated at 13. The legs 14 have means for positioning and holding them with respect to the cross beams, and where the cross beams are provided with transverse notches 12 the legs 14 may have the preferably central upstanding projections or lugs 15 to fit in the notches 12. The legs 14 are preferably tapered toward their lower ends, and where, as is customarily the case, the bench stands on the ground in the greenhouse, the legs 14 may be set for a few inches in the ground and may have a small quantity of concrete mortar placed about their lower ends, a shallow opening being provided in the ground for receiving the ends of the legs and the mortar surrounding them, whereby a firm and solid footing may be given to the bench and a firm and stiff standing structure obtained.

The beams 11 are placed transversely of the benches, and the floor, side and end members are supported thereby. The floor members 16 are preferably narrower at their bottoms than at their tops and may be provided with sides 17, 17 converging downwardly toward one another, as shown in Fig. 3. With such arrangement, when the floor members 16 are placed adjacent to one another, leaving narrow openings 18 therebetween for the escape of water and for ventilation, these openings 18 are practically never clogged up, as any material which passes through the narrow openings between the tops of the floor members falls through to the ground, and also the circulation of air is assisted both by the fact that the openings will not clog up, and because of the fact that openings having wide mouths at their bottoms are presented for the upwardly moving air which readily passes through the opening between the floor members and into and through the earth contained in the bench, thus assuring proper ventilation and aeration.

With the floor members arranged longitudinally in the manner described, it becomes possible to provide drainage and ventilation openings therebetween throughout the width of the bench and close up to the side members so that there is no dead or undrained and unventilated space left at the sides of the bench, as would result where the supporting beams are placed longitudinally and the floor members arranged transversely to bridge over the space between the longitudinal supporting beams.

In the form shown, and in order to secure such openings close to the side walls, I preferably combine side walls and floor members for the outer sides of the benches in a single piece, this construction also making it possible to obtain side members which have a broad base and which stand erect and are not pushed or tilted outward by the weight of earth contained in the bench. In Fig. 2 there is shown one of the side members 19 which comprises an upstanding portion 20 and a bottom part 21 formed integrally therewith and projecting inwardly of the bench for a short distance, the portion 21 serving to make up a part of the floor of the bench and also to give the side member 18 a broad, flat base so that it is not readily pushed out or overturned. This horizontal portion 21 is preferably comparatively narrow so that the opening 18 between it and the adjacent floor member 16 is substantially close to the side wall 21 of the bench, thus affording drainage and ventilation close up to the sides, or at least so close thereto as is desirable or requisite. These side wall members are preferably formed with a notched-out corner 22, as indicated in Fig. 2, which portion is filled with binding material such as cement mortar when the bench is assembled as hereinafter described.

The end members 23 of the benches are preferably similar to the side members in construction, comprising upright wall portions 24 and horizontal portions 25 at the lower edges thereof and preferably formed integral therewith and affording a broad, flat base for preventing overturning of the end members, and an under-cut notch 26 extending along the inner corner of the end members is preferably provided for receiving cementitious material such as cement mortar when the structure is assembled. The end members 23 are preferably arranged with the horizontal portion 25 extending outwardly, which is the reverse arrangement as compared with that of the side wall members. All the parts are preferably reinforced, as by means of steel rods or the like, and in the case of the floor members, the reinforcing means preferably extend beyond the ends of the separate pieces, as indicated in Fig. 5 where the reinforcing members 27 are shown extending at 28 beyond the ends of the respective floor members and so arranged as that the projecting ends of the reinforcing pieces in one floor member are preferably spaced a short distance away from the similar projecting end pieces in the adjacent floor member. In the form shown the reinforcing members consist of rods extending endwise through the sections and converging at a slight angle so that those projecting from one end of the floor member are somewhat closer together than those projecting from the opposite end of such member and also than those project-

ing from the adjacent end of the next floor member in the series. In assembling the floor members a space 29 is preferably left therebetween where the ends are supported on the cross beams 11, into which space the reinforcing means, as 28, project, and such space is preferably filled with cementitious material such as cement mortar, such material also extending into the cut out portions 22 in the parts 21 of the side wall member 19, which cut outs 22 are preferably arranged in substantial alinement with the space between the floor members filled with cementitious material 30, so that all the parts are firmly and securely bound together when the mortar is set and hardened. Likewise a space is preferably left between the end members 23 and the floor members, and such space is filled with cementitious material 31, the same also extending into and filling the under-cut notch or chamfer 26 in the end members 24 and forming a binding for holding these parts tightly and securely together. Cement mortar or the like cementitious material may be used, of course, in the joint where any two parts come together, and this is particularly desired if it is found that in the arrangement of the parts a crack or opening is left at the juncture of two adjacent sections.

It will be seen that by the present invention it is possible to construct efficient and durable greenhouse benches by the labor ordinarily available in greenhouses, that the sections may be made up and set aside to harden from time to time as there is opportunity therefor, and that when a sufficient number of sections are available it is readily possible to remove the old benches and immediately replace them with new, the only time that is required to make the benches available for use, save for the actual setting up work, being the short time necessary for the cement mortar comprised in my improved bench to harden, and inasmuch as no strain is required to be borne by such mortar, it is not necessary that it be permitted to cure and harden for an extended period, as would be required, for example, in the case of newly molded floor beams.

Sectional benches of concrete embodying the present invention may be taken down, as for example, when the greenhouseman wants to make changes in his floor lay-out or the like, and can be reërected in other positions or locations, and by making the cementitious filling between sections of suitable character, as, for example, by reduction of the cement content thereof, this can readily be done without injury to the sectional parts of which the bench is made up. The slabs making up the floor may be spaced greater or lesser distances apart, adapting the bench to the particular flowers or plants which are being grown. Dirt may readily be shoveled out, without obstruction, by reason of the lengthwise arrangement of the floor slabs which are locked firmly in place and are not shifted or disturbed by repeated emptying and refilling operations. The sections may be made light because with the improved forms they may be made of wet concrete which is much stronger and lighter than when made of dry or semi-dry concrete, and they can be handled by one man, with also a consequent saving in material. Other advantages of the invention have already been pointed out.

It is to be understood that the embodiment illustrated and described is for the purpose of affording a clear understanding of my invention only, and that I am not to be limited thereto, but that changes and modifications may be resorted to within the scope of my claims and without departing from my invention or sacrificing any of its advantages.

Having thus described my invention, I claim:

1. A greenhouse bench comprising members of ready molded and hardened concrete, including transversely arranged cross beams, longitudinally arranged floor beams supported on the cross beams, and side wall members having notched inwardly projecting portions and forming a portion of the floor, and a filling of cementitious material on the cross beams adjacent to the side wall members and extending into and filling the notches within the side wall members.

2. A floor section of reinforced and hardened concrete for a greenhouse bench having reinforcing members projecting from its opposite ends, the projecting portions at one end being laterally displaced or offset with respect to those at the opposite end and with respect to similar projecting portions on adjacent sections when such sections are arranged end to end.

3. A greenhouse bench composed of members of ready molded and hardened concrete and comprising transversely arranged cross beams, longitudinally arranged individual floor beams on said cross beams and with longitudinal openings therebetween, and side wall members having floor portions integrally molded therewith and also adapted to rest on said cross beams, there being longitudinal openings between said side wall members and the floor members substantially close up to the side wall members.

4. A greenhouse bench composed of members of ready molded and hardened concrete and including transversely arranged cross beams, longitudinally arranged floor beams supported on said cross beams, side wall members having floor sections projecting inwardly, and end wall members having lower flanged portions projecting outwardly.

5. A greenhouse bench comprising mem-

bers of ready molded and hardened concrete, including transversely arranged cross beams, longitudinally arranged floor beams having their ends supported on the cross beams and spaced apart and having reinforcing members therein and projecting into the spaces therebetween, side wall members having notched inwardly projecting bottom members and forming a portion of the floor, the floor being provided with longitudinally arranged openings and certain of said openings being located closely adjacent to said side wall members, and a filling of cementitious material on the cross beams and between the ends of the floor beams and including the projections of the reinforcing material and also filling the notches in the side wall members.

6. A greenhouse bench comprising members of ready molded and hardened concrete, including transversely arranged cross beams and end wall members having outwardly projecting bases and having undercut notches on their lower edges, the floor beams having reinforcing members therein and projecting into said notches, and a filling of cementitious material for the space between the end wall and the end members and received in the undercut notches, the projecting reinforcing members being embedded in said cementitious material.

7. A floor section of reinforced and hardened concrete for a greenhouse bench having downwardly converging sides and provided with reinforcing members extending lengthwise therethrough, said reinforcing members converging toward one another from end to end and projecting beyond the ends of the members, the projecting portions being located closer together at one end than at the other.

8. A floor section of reinforced and hardened concrete for a greenhouse bench having downwardly converging sides and provided with reinforcing members extending lengthwise therethrough, said reinforcing members projecting beyond the ends of the members, the projecting portions of the reinforcing members at one end being laterally displaced or offset with respect to those at the opposite end and with respect to similar projecting portions on adjacent sections when such sections are arranged end to end.

In testimony that I claim the foregoing, I hereto set my hand, this 5th day of July, 1917.

FRED J. MEAD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."