June 27, 1950 T. O. MARINI 2,512,662

FURNITURE

Filed June 11, 1947 3 Sheets-Sheet 1

Fig. 1

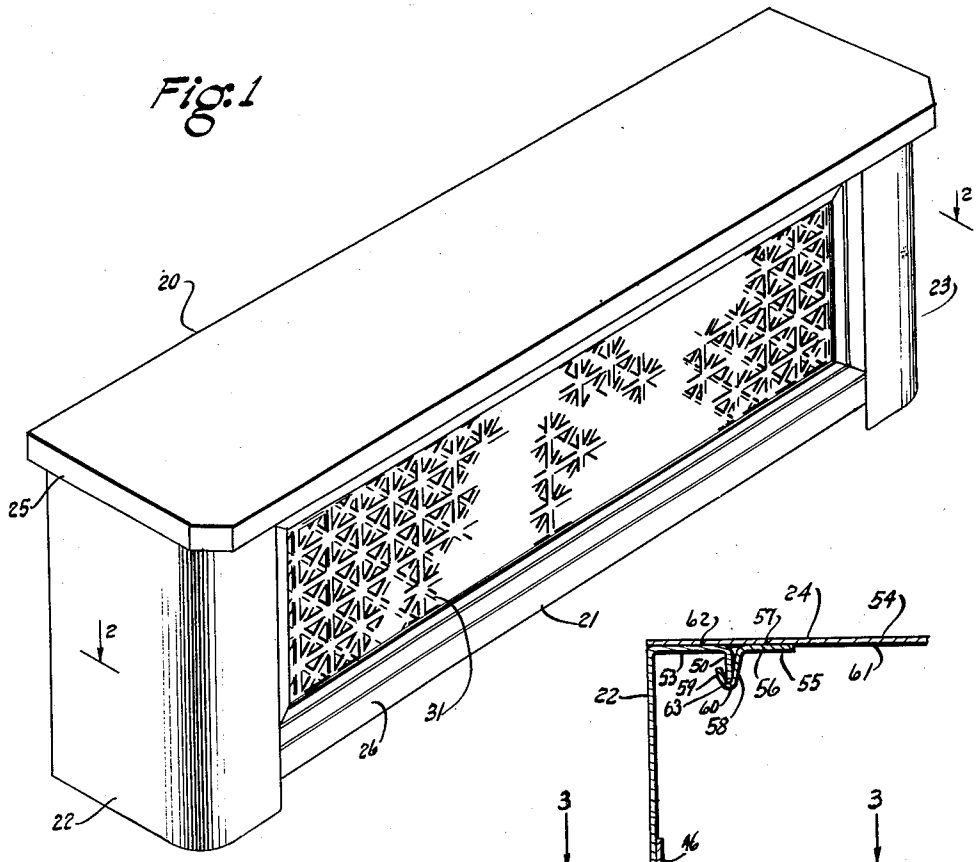


Fig. 2

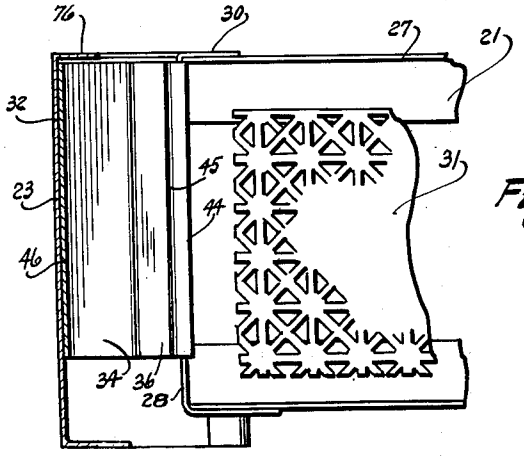


Fig. 3

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FURNITURE

Filed June 11, 1947 3 Sheets-Sheet 2

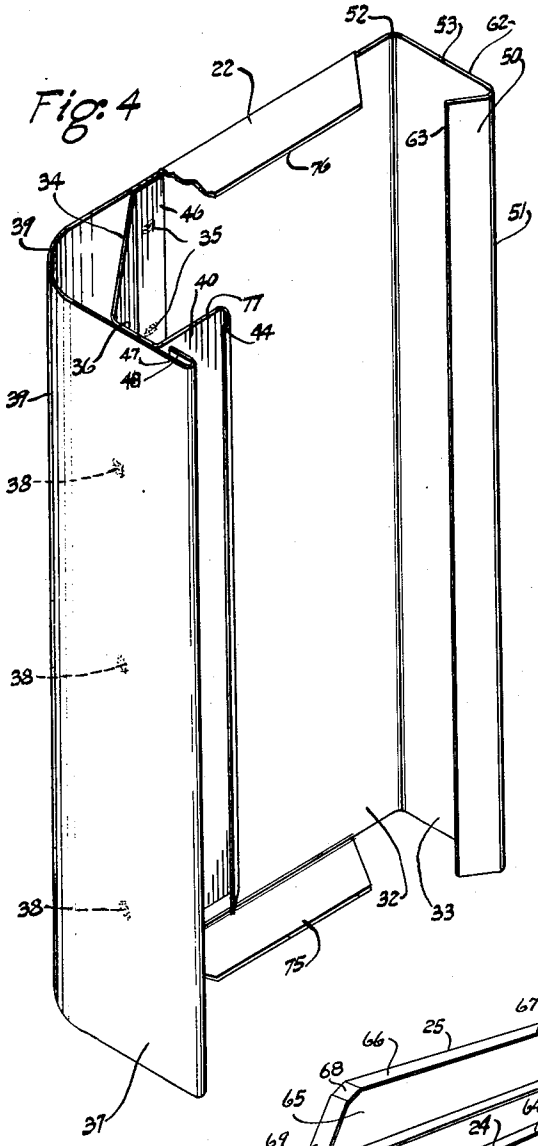


Fig: 4

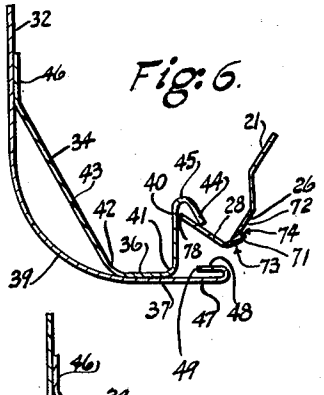


Fig: 6.

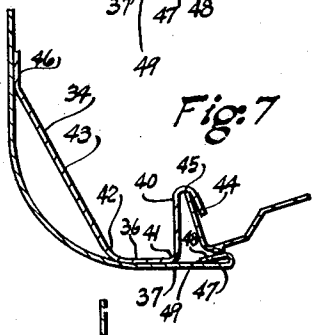


Fig: 7

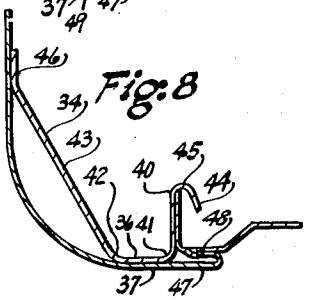


Fig: 8

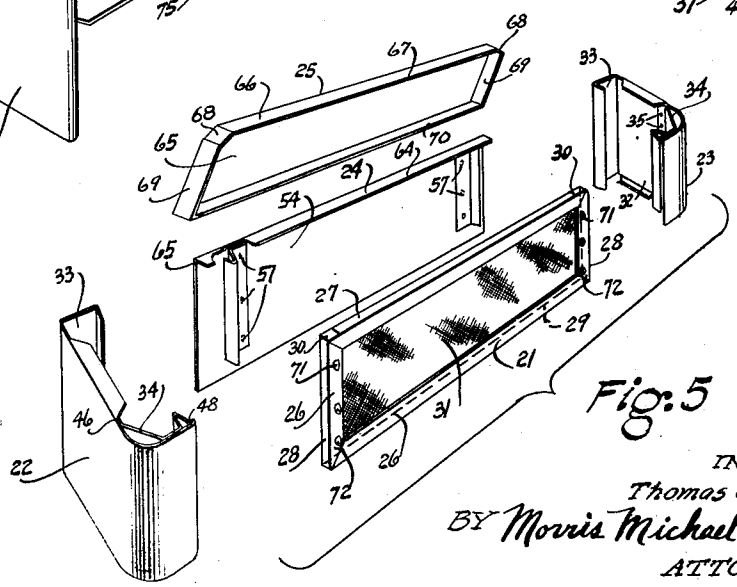


Fig: 5

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FURNITURE

Filed June 11, 1947 3 Sheets-Sheet 3

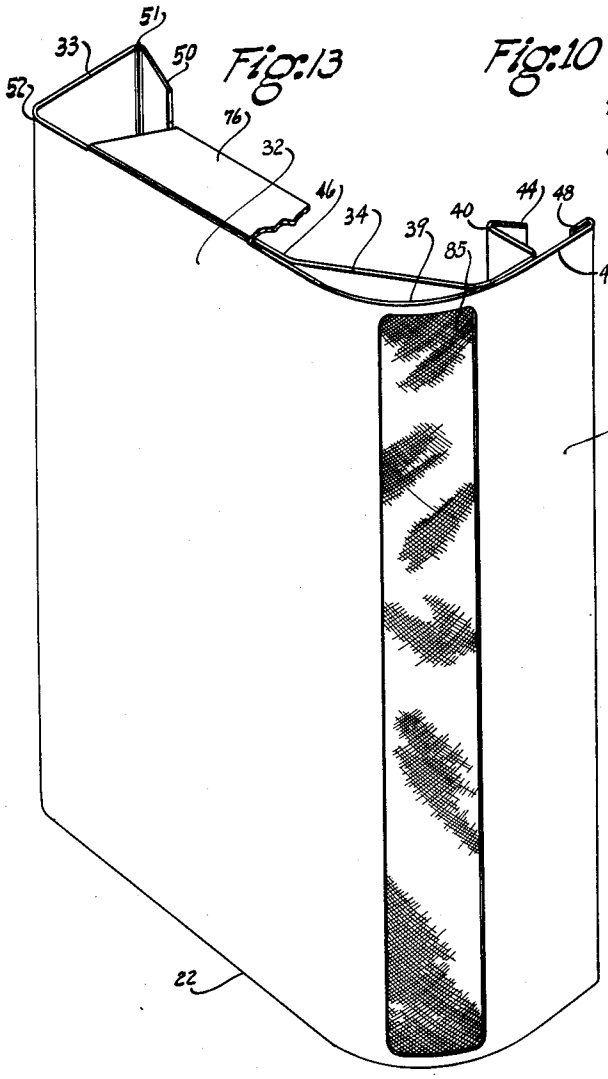


Fig: 13

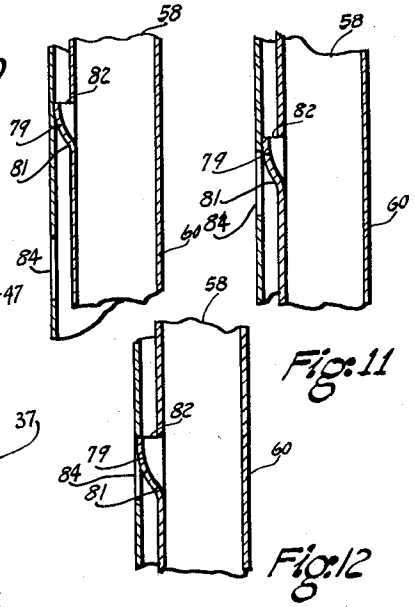


Fig: 10

Fig: 11

Fig: 12

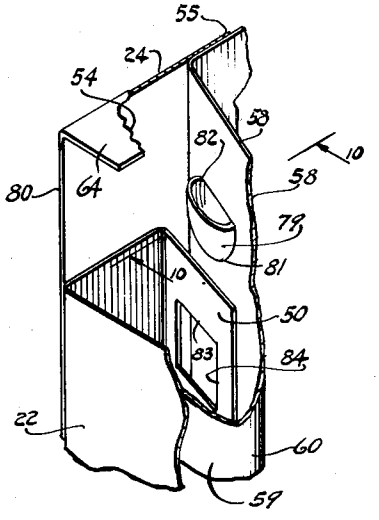


Fig: 9

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Patented June 27, 1950 2,512,662

UNITED STATES PATENT OFFICE

2,512,662

FURNITURE

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Application June 11, 1947, Serial No. 753,873

10 Claims. (Cl. 237—79)

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This is a continuation-in-part of my original application for Letters Patent on Radiator Enclosure, filed October 11, 1946, Serial No. 702,737, and also of my original application for Letters Patent on Radiator Enclosure, filed November 1, 1946, Serial No. 707,122.

My invention relates to pre-fabricated furniture, and it relates more particularly to furniture which is adapted to be shipped in so-called knock-down form and assembled at the location where it is intended to be used.

Because of the bulk of certain articles of furniture now on the market, it is common practice to construct them of parts readily assembled. This construction effects economies in packaging, storage space, shipment, etc. However, it has certain disadvantages in that at the place of installation, unskilled labor is often employed which frequently introduces an assembly problem, particularly if tools are required.

It is an object of the present invention to provide an article of furniture of the so-called knock-down or pre-fabricated type, characterized by simplicity of construction, ease of assembly with respect to time and tools required, etc.

Another object of my invention is to provide an article of furniture which is formed of so-called knock-down parts and which will nevertheless be sturdy and rigid when assembled, and which assembly may be made without the use of tools.

A further object of my invention is to provide an article of furniture so constructed as to comprise artistically formed areas without detracting from the utility, strength and rigidity of the whole structure.

Another object of the invention is the provision of a frame which may be formed as a unit by a die operation and pre-fabricated as part of a side member, and adapted to form an interlocking joint with a wall section by merely bringing the interlocking portions into engagement with a snap movement.

A further object of my invention is to provide an article of furniture of so-called knock-down construction, which is inexpensive to manufacture, reliable in use, easy to assemble and once assembled, incapable of undesired disassembly.

Another object of my invention is to provide an article of furniture of so-called knock-down construction, which is capable of being completely assembled and then partially disassembled for removal from the location of use, without causing collapse of the remaining structure.

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With the above and other objects in view, my invention comprises an article of furniture having a front member, side members, a rear member and a top; said front member comprising an upper flange, side flanges and a frontal portion; each of said side members comprising a front portion and a side portion angularly disposed with relation thereto, a frame interiorly disposed between said front and side portions and connected therewith, and a flange-receiving member projecting rearwardly from said front portion; locking means adapted to lock said frontal portion to said front portion when the side flange is inserted in said flange-receiving means and said frontal portion is swung into appositon to said front portion; said upper flange cooperating with said flange-receiving member to limit the downward displacement of said front member; and locking means including a flange and a flange-receiving member operably to interlock said rear member and said side members.

My invention further consists of an article of furniture having a side member comprising a side portion, a front portion, and force-transmitting means connecting said side and front portions; and an artistic portion disposed between said side and front portions.

For the purpose of illustrating my invention, I have shown in the accompanying drawings forms thereof which are at present preferred by me, since the same have been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangements and organizations of the instrumentalities as herein shown and described.

Referring to the drawings in which like reference characters indicate like parts:

Figure 1 represents a perspective view of an assembled article of furniture embodying my invention.

Figure 2 represents a sectional view of one end of an article of furniture embodying my invention, taken generally along the lines 2—2 of Figure 1.

Figure 3 represents a sectional view of the other end of the article of furniture illustrated in Figure 2, and taken generally along lines 3—3 of Figure 2.

Figure 4 represents a perspective view of a side member forming part of an article of furniture embodying my invention.

Figure 5 represents an extended view of the component parts comprised in an article of furniture embodying my invention.

Figures 6, 7 and 8 respectively represent sectional views illustrating three successive steps in assembling a front member with a side member, of an article of furniture embodying my invention.

Figure 9 represents a perspective view, partly broken away, of the locking mechanism of an article of furniture of modified construction embodying my invention, whereby the rear member and side members may be permanently locked when assembled.

Figures 10, 11 and 12 respectively represent sectional views taken generally along the lines 10—10 of Figure 9, showing three successive steps of assembling the rear member and a side member in permanently locked relation to each other.

Figure 13 represents a perspective view of a side member of another modified construction of an article of furniture embodying my invention.

For purposes of illustration, I have shown my invention as applied to the construction of an article of furniture known as a radiator enclosure, although it is to be understood that my invention is equally applicable to other forms of furniture, such for instance, as counters, tables, ventilator outlets, amplifier cabinets, hampers, etc.

According to my invention, I provide component parts of an article of furniture 20, with means for interlocking these parts one with another until the whole is assembled. For convenience in describing the invention, I have herein shown the article of furniture 20 as formed of a front member 21, two oppositely disposed side members 22 and 23, a rear member 24 and a top 25. The front member 21 comprises a frontal portion 26, an upper flange 27, side flanges 28 and a bottom flange 29. If desired, a reinforcing flange 30 may be disposed above the ends of the upper flange 27, and may be formed by an upstanding lug projecting from the side flanges 28 and bent over the upper flange 27 into juxtaposition thereto. A suitable grill or other ornamental or utilitarian device 31 may be disposed centrally of the front member 21 and secured by any suitable means to the frontal portion 26. This grill 31 as well as all other portions of the enclosure 20, may be formed of sheet material such as sheet metal.

The side members 22 and 23 preferably each comprise a side portion 32, and preferably a rear portion 33 perpendicularly projecting therefrom. A frame member 34 is preferably secured along a wall 46 thereof, by any suitable means such as the spot welds 35 to the side member 32, and projects obliquely forward to a base panel 36. A front portion 37 of the side member 22 is preferably secured to the base panel 36 by any suitable means such as the spot welds 38. An ornamental or otherwise artistic portion such as the curved wall 39 is disposed between the side portion 32 and the front portion 37.

A wall member 40 projects rearwardly and preferably perpendicularly from the edge 41 of the base panel 36 opposite to the edge 42 thereof which joins said base panel 36 to the oblique portion 43 of the frame 34. A flange 44 projects from the wall member 40 at an acute angle thereto, forming therebetween a nest 45. If desired, the flange 44, nest 45, wall 40, base panel 36, oblique portion 43, and wall 46, comprised in the frame 34, may be formed integrally, and may be formed in one die stamping operation.

The front portion 37 of the side member 22 projects laterally from the base panel 36, as at 47, and is preferably reversely bent to a flange 48 which is preferably spaced from the front portion 37 a distance substantially equal to the thickness of the flange 48. The flange 48 terminates in a vertical edge 49 spaced from the wall 40.

A flange 50 projects inwardly from the edge 51 of the rear portion 33, which is opposed to the edge 52 thereof which joins the rear portion 33 with the side portion 32. If desired, a suitable foot 75, substantially in the form of a flange, may extend inwardly from the bottom edge of the side member 22, and also a suitable mounting plate 76 may extend inwardly from the upper edge of the member 22. Also, if desired, the flange 48, front face 37 including the lateral projection 47, artistic portion 39, side portion 32, rear portion 33 and rear flange 50, as well as the foot 75 and mounting plate 76, all comprised in the side member 22, may be formed integrally.

The rear member 24 comprises the rear wall 54 preferably but not necessarily extending the full length of the article of furniture, and also preferably but not necessarily of a height substantially equal to the height of the side member 22. A locking mechanism 55 is provided, and preferably comprises a base 56 secured to the rear wall 54 by any suitable means, such as the spot welds 57. A wall 58 projects forwardly from the base 56, and preferably at an obtuse angle thereto. A flange 59 projects rearwardly from the forward edge 60 of the wall 58, and preferably at an acute angle thereto, operably to form a nest therebetween preferably normally spaced from the forward face 61 of the rear wall 54 a distance slightly less than the distance between the rearward face 62 of the rear portion 53 of the side member 22, and the forward edge 63 of the flange 50. A flange 64 is preferably provided, projecting forwardly perpendicularly from the upper edge 65 of the rear wall 54, and preferably extending continuously the whole length of the rear wall 54. If desired, the rear wall 54 and flange 64 may be formed integrally.

The top 25 preferably comprises a panel 65 and a continuous flange 66 downwardly projecting from the outer edges thereof. The flange 66, preferably comprising the front flange 67, front-corner flanges 68, side flanges 69 and rear flange 70, while preferably formed integral with the panel 65, are also preferably struck from one piece of sheet material and bent until the edges of the component flanges conjoin. They may then be united by any suitable means such as soldering or welding, or may simply be positioned alongside of each other and covered by any suitable material such as paint.

In the formation of the front member 21, suitable nodes 71 are struck out of, or otherwise formed in, the sides 72 of the frontal portion 26. These nodes 71 are preferably, but not necessarily, formed of half-moons or buttons having a curved camming face 73 projecting forward from the side thereof nearest the side flange 28 to the vertical edge 74 which itself projects forwardly of the forward face of the frontal portion 26. The vertical edge 74 is spaced from the outer edge of the side flange 28 a distance substan-

tially equal to the distance between the vertical edge 49 of the flange 48 and the wall 40 of the frame 34. Moreover, the flange 28 is of a width substantially equal to, or slightly less than the distance between the nest 45 of the frame 34 and the rearward face of the lateral projection 47 of the front portion 37 of the side member 22.

In operation, when it is desired to assemble the article of furniture of my invention, the front member 21 is lifted until its upper flange 27 is positioned substantially on a level with the upper edge 77 of the wall 40. The side flange 28 of the front member 21 is then inserted into the nest 45 of the frame 34 of the side member 22. In doing so, the wall 40 serves as a cam surface for the leading edge 78 of the flange 28, directing said edge rearwardly to the nest 45 where it serves as a pivot, as may be seen in Figures 6 and 7. As the leading edge 78 is brought into juxtaposition to the nest 45, and the front member 21 swung forwardly, the node 71 is itself brought into juxtaposition to the reverse flange 48. Thereupon, continued rotation of the front member 21 about the nest 45, causes the node 71 to bear against and depress the reverse flange 48 in a forward direction against the spring action of the reverse fold of the flange 48 and of the lateral projection 47. By virtue of such spring action, the reverse fold 48 yields to the further rotation of the front member 21 about the nest 45 until the vertical edge 74 of the node 71 has passed the vertical edge 49 of the reverse flange 48, whereupon the reverse flange 48 springs rearwardly to its original position, thereby locking the node 71 between the flange 48 and the wall 40. In this position, the flange 28 of the front member 21 abuts the wall 40 and is flush thereagainst, as can be seen more readily by reference to Figure 8. Moreover, the flange 28 is embraced against forward or rearward movement by the nest 45 abutting the leading edge 78, and the frontal portion 26 abutting the reverse flange 48 in flush relation thereto. Moreover, the upper flange 27 and the lower flange 29 of the front member 21 embrace the wall 40 therebetween, thereby interlocking the front member against upward or downward displacement with the side member. It will thus be seen, that the front member 21 is permanently locked with the side member 22. Not only so, but the flange 48 serves to support the front member 21 against forward strain or rotation, and the wall 40 serves to block any tendency toward rearward rotation of the member 21, thereby making a very rigid joint.

In like manner, the front member 21 is firmly and permanently locked with the side member 23 and supported thereby in a rigid joint.

The U-shaped unit thus formed is then moved into position where it is desired to use the article of furniture. It will be found that the side walls 32 of the side members 22 and 23 are substantially parallel. The rear member 24 is then positioned with its rear wall 54 bearing against the rear portions 33 of the side members 22 and 23, and with its locking mechanisms 55 positioned immediately above the flanges 50 of the side members 22 and 23. In this position, each of the flanges 50 is disposed immediately beneath a locking mechanism 55, and between the wall 58 and flange 59 thereof. The flange 59 is then pushed forwardly sufficient to cause the nest 60 to move forwardly and laterally against the spring action of the wall 58 and its juncture with its base 56. By so doing, sufficient space is uncovered between the nest 60 and the rear wall 54 to enable the flange 50 to enter therein. The rear member 24 is then urged downwardly with the locking mechanism 55 embracing the flanges 50, until the upper flange 64 of the rear member 24 bears against the upper edge of the rear wall 53 of the side members 22 and 23. In doing so, the upper flange 64 may be used as a handle member. The top 25 is then lowered into position, with its flanges 66 embracing the outer faces of the front, side and rear members, and the article of furniture of my invention is now completely assembled.

When it is desired to move the article of furniture, it may be lifted bodily, or when as in the case of a radiator enclosure, it is used to cover a fixed object, it is simply necessary to lift the top 25, and raise the rear member 24 until the locking mechanisms 55 uncover the flanges 50. The interlocked front and side members 21, 22 and 23 may then be removed as a unit. Further reassembling may be made where desired, in the manner hereinbefore described.

In Figures 9 to 12, inclusive, an article of furniture is illustrated, having a modified construction embodying my invention. In this modification, means are provided for permanently interlocking the rear member 24 with the side members 22 and 23. Accordingly, a spring lock 79 is provided in the locking mechanism 55. This spring lock 79 may be in the form of a node such as a half-moon or button struck from the wall 58, and projecting therefrom toward the side edge 80 of the rear wall 54. The node 79 comprises a cam surface 81 extending upwardly and sidewardly from the inner face of the wall 58, and terminating in an upper, horizontal edge 82.

In this modification, the flange 50 comprises a co-acting horizontal edge 83 disposed at a distance from the upper edge of the side member 22, substantially equal to the distance between the horizontal edge 82 and the lower edge of the flange 64 of the rear member 24. A suitable recess 84 may be formed in the flange 50 beneath the horizontal edge 83, to receive the node 79; or if desired, the horizontal edge 83 may be formed along the lower edge of the flange 50.

In operation, when the rear member 24 is lowered into place against the side members 22 and 23, and the locking mechanism 55 embraces the flange 50 as hereinbefore described, the node 79 is brought to bear against the flange 50 and urges it laterally towards the side, against the spring action of the fold between the flange 50 and the rear wall 53, and also against the natural resilience of the sheet material of which the flange 50 and rear wall 53 are formed. Continued downward displacement of the rear member 24 carries the node 79 with it until the upper, horizontal edge 82 of the node 79 uncovers the lower, horizontal edge 83 of the flange 50; whereupon the flange 50 springs back into place with the horizontal edge 83 immediately above the horizontal edge 82 of the node, thereby locking it against vertical displacement. The wall 58 and flange 59 of the locking mechanism 55 embrace the flange 50 against lateral displacement, and the nest 60 and the rear wall 54 embrace the flange 50 against displacement in a forward or rearward direction. The rear member 24 is therefore now permanently interlocked with the side members 22 and 23.

In Figure 13 is illustrated another modified construction of an article of furniture embodying my invention, with particular reference to the construction of the side member. In this

modification, the corner portion 39 disposed between the frontal portion 37 and the side portion 32, is reduced to a mere skeleton framework upon which is mounted an ornamental material 85. Rigidity of the structure is not materially affected however, because the stresses and strains which might be imposed on the structure are primarily transmitted between the side portion 32 and the front portion 37 by means of the frame 34.

Indeed this transmission of forces is likewise carried out in the structure illustrated in Figure 4. Nevertheless, it can also be seen that, particularly with the modification illustrated in Figure 4, and secondarily with that illustrated in Figure 13, there is provided a rigid trussing between the oblique wall 43 of the frame 34, the side portion 32, and front portion 37 of the side member 22; thereby rendering great rigidity to the side members, and ultimately to the whole structure.

Moreover, by the construction of my novel invention, the locking mechanisms are substantially air-tight, as may be seen by reference to the flush relation between the frontal portion 26 and the reverse flange 43, the flange 28 and the wall 40, the leading edge 78 and the nest 45, in the locking mechanism between the front member 21 and the side member 22; and as between said side member 22 and the rear member 24: the flush relation between portions of the wall 58 and the flange 50, the leading edge 63 of the flange 50 and the nest 69 of the locking mechanism 55, and the rear wall 54 and the rear portion 53. Not only so, but the spring relation between portions of the locking mechanism assures that the air-tight joint is maintained. As a result, the article of furniture of my invention is admirably suited for use where an air-tight enclosure, or an air-tight joint, is desired.

Also, it will be noted that by the novel construction of my invention, not only is a spring lock provided between the front and side members, but by the large mechanical advantage provided by using the main body of the front member 21 as a lever, the urging of the nodes 71 against the spring flange 48 into locking engagement therewith, is greatly facilitated. Not only so, but by the use of such spring locks, means are provided to inform the layman when the locking engagement is complete, for no "snap" will occur until the lock has sprung. Thus, it may readily be seen that no skill is required to assemble the article of furniture of my invention, and that this assembly may be accomplished with no tools whatsoever, and in the shortest possible time.

It can readily be seen, that by my novel invention, it is rendered possible to ship a prefabricated article of furniture in so-called "knock-down" condition, and assemble it where desired on the premises. Not only so, but the structure so assembled is of marked rigidity and sturdiness, and capable of being formed along artistic lines and indeed, if desired, to bear ornamentation where such ornamentation is not available in similar articles of furniture hitherto known, without weakening the structure thereof. In addition, the article of furniture of my novel invention is capable not only of ready and facile assembly, but also, if desired, of easy and quick disassembly and removal without collapsing the structure.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiments to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A pre-fabricated structure comprising a front member and a side member; said front member comprising a frontal portion and a flange; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest adapted to receive said flange; spring locking mechanism adapted to interlock said frontal portion and said front portion when said flange is disposed within said nest in the assembly of said structure.

2. A pre-fabricated structure comprising a front member, a side member and a rear member; said front member comprising a frontal portion and a flange; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest adapted to receive said flange; spring locking mechanism adapted to interlock said frontal portion and said front portion when said flange is disposed within said nest in the assembly of said structure; and locking means between said side member and said rear member.

3. A pre-fabricated structure comprising a front member, a side member and a rear member; said front member comprising a frontal portion and a flange; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest adapted to receive said flange; spring locking mechanism adapted to interlock said frontal portion and said front portion when said flange is disposed within said nest in the assembly of said structure; and locking means between said side member and said rear member; said locking means comprising a flange projecting from one member and a flange-receiving nest formed on the other member.

4. A pre-fabricated structure comprising a front member, a side member and a rear member; said front member comprising a frontal portion and a flange; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest adapted to receive said flange; spring locking mechanism adapted to interlock said frontal portion and said front portion when said flange is disposed within said nest in the assembly of said structure; and locking means between said side member and said rear member; said locking means comprising a flange projecting from one member and a flange-receiving nest formed on the other member, and spring locking means adapted permanently to interlock said members with each other.

5. A pre-fabricated structure comprising a front member and a side member; said front member comprising a frontal portion, a side flange and a node; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest; a spring projecting from said side member; the arrangement of parts being such that when said flange is disposed within said nest and said front member is moved toward assembly position, said node will depress said spring, and release said spring substantially when said assembly position is reached.

6. A pre-fabricated structure comprising a front member, a side member and a rear member; means to join said front and side members; means to interlock said side and rear members, said interlocking means comprising a flange on one member and a nest on the other member; a node projecting from one of said last mentioned members, and a spring projecting from the other thereof; the arrangement of parts being such that when said flange is disposed in said nest and said rear member is moved toward said assembly position with said side member, said node will depress said spring, and release said spring when said assembly position is reached.

7. A pre-fabricated structure comprising a front member, a side member and a rear member; said front member comprising a frontal portion, a side flange and a node; said side member comprising a side portion, a frame secured to said side portion, and a front portion secured to said frame; said frame comprising a nest; a spring projecting from said side member; the arrangement of parts being such that when said flange is disposed within said nest and said front member is moved toward assembly position, said node will depress said spring, and release said spring substantially when said assembly position is reached; means to interlock said side and rear members, said interlocking means comprising a flange on one member and a nest on the other member; a node projecting from one of said last mentioned members, and a spring projecting from the other thereof; the arrangement of parts being such that when said flange is disposed in said nest and said rear member is moved toward said assembly position with said side member, said node will depress said spring, and release said spring when said assembly position is reached.

8. A pre-fabricated structure comprising a front member and a side member; said front member comprising a frontal portion, a side flange, and an upper projection; said side member comprising a side portion, a frame projecting from said side portion and a front portion secured to said frame; said frontal portion and said front portion being parts of the facade of said structure; said frame comprising a flange-receiving means; said flange-receiving means adapted to receive said flange when said frontal portion is in apposition to said front portion, and said upper projection being adapted to bear against a portion of said frame to limit displacement of said front member when said frontal portion is in said apposition to said front portion.

9. A pre-fabricated structure comprising a front member and a side member; said front member comprising a frontal portion, a side flange, an upper projection and a lower projection; said side member comprising a side portion, a frame projecting from said side portion and a front portion secured to said frame; said frontal portion and said front portion being parts of the facade of said structure; said frame comprising a flange-receiving means; said flange receiving means adapted to receive said flange when said frontal portion is in apposition to said front portion; said upper and lower projections being adapted to bear against said portion of said frame to limit displacement of said front member when said frontal portion is in apposition to said front portion.

10. A prefabricated structure comprising a plurality of members; a frame projecting from one of said members and a flange projecting from another of said members; said frame comprising retaining means adapted to receive said flange; spring locking mechanism adapted securely to interlock said members when said flange is juxtaposed to said retaining means in the assembly of said structure.

THOMAS O. MARINI.

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The following references are of record in the file of this patent:

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