A. C. GAYNOR.

CEILING AND FLOOR PLATE.

APPLICATION FILED MAY 26, 1919.

1,335,730. **Patented Apr. 6, 1920.**

2 SHEETS—SHEET 1.

Fig. 1

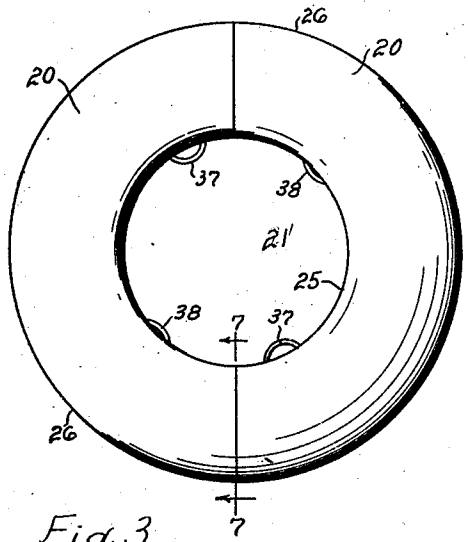


Fig. 2

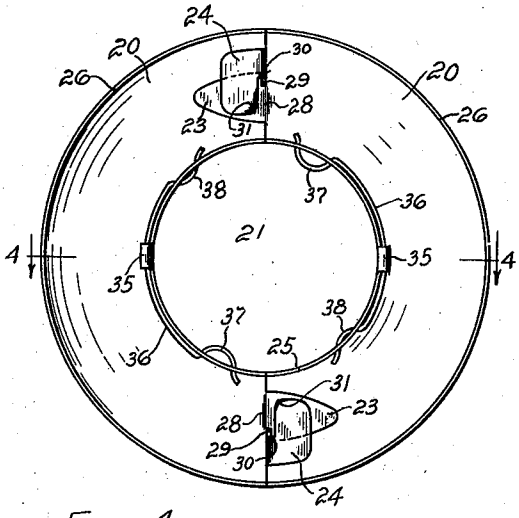


Fig. 3

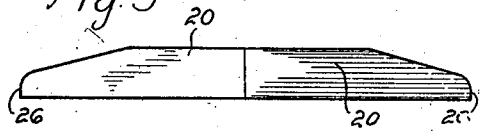


Fig. 4

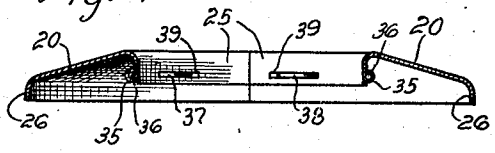


Fig. 5

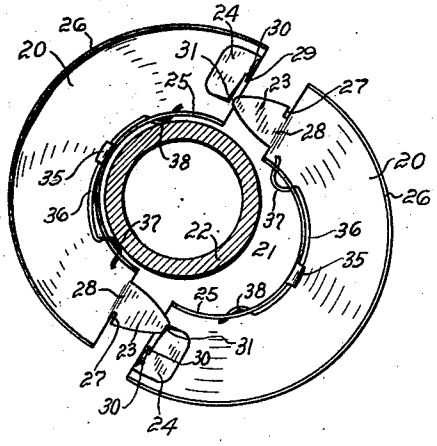


Fig. 6

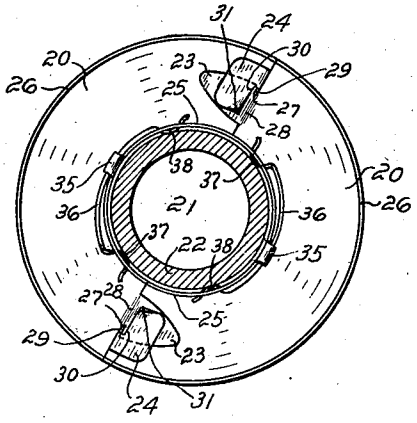
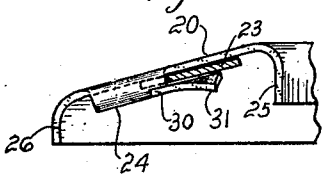


Fig. 7



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2 SHEETS—SHEET 2.

Fig. 8

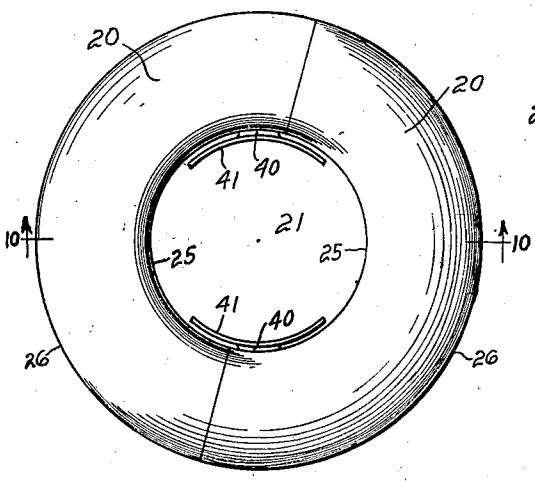


Fig. 9

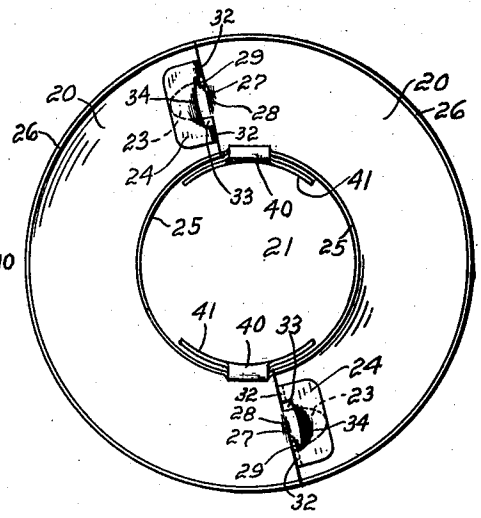


Fig. 10

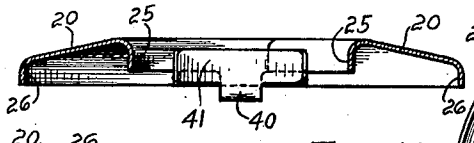


Fig. 12

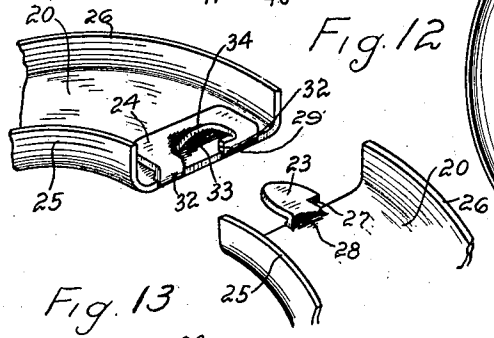


Fig. 11

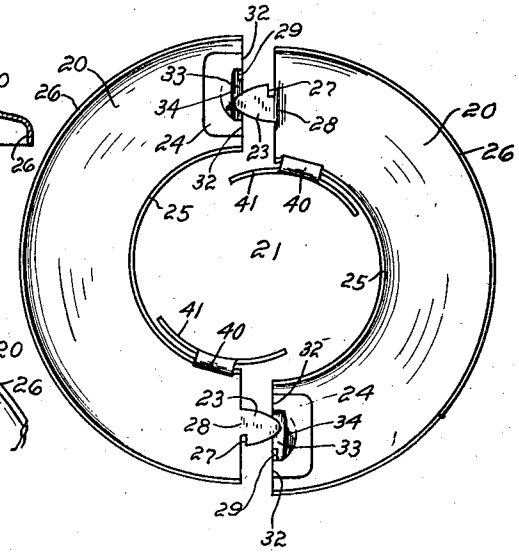
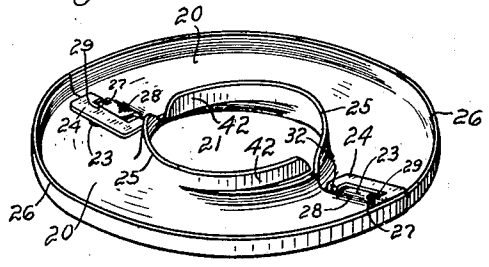


Fig. 13



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UNITED STATES PATENT OFFICE.

ARTHUR C. GAYNOR, OF STRATFORD, CONNECTICUT.

CEILING AND FLOOR PLATE.

1,335,730. Specification of Letters Patent. **Patented Apr. 6, 1920.**

Application filed May 26, 1919. Serial No. 299,764.

To all whom it may concern:

Be it known that I, ARTHUR C. GAYNOR, a citizen of the United States, residing at Stratford, county of Fairfield, State of Connecticut, have invented an Improvement in Ceiling and Floor Plates, of which the following is a specification.

This invention relates to the class of ceiling and floor plates, each consisting of two interchangeable members, described and claimed in my Patent No. 1,229,061, dated June 5, 1917, and the present invention has for its object to provide a structure of this type, so improved in details of construction as to reduce the cost of production by automatic machinery to the minimum, and furthermore to greatly improve the operation in attaching and detaching the plates.

A further object of the invention is to provide a plate, the members of which shall incline downward from the semi-circular recess toward the edge, the effect of which is to cause the tongues to ride down an inclined plane in the locking movement, and produce a binding action between the tongues and the keepers which effectually prevents looseness and rattling of the members, and retains the members in the locked position.

A further object of the invention is to produce a plate of this character in which the springs are so constructed and arranged as to have a resultant force parallel to and in the direction of the locking movement of the members and of sufficient magnitude to hold the members securely locked together, so that when the plate is in place on a pipe the springs, as well as the inclines and tongues, will act to retain the members in that position, and in the assembling operation will act to prevent any tendency of the members to buckle.

With these and other objects in view I have devised the novel ceiling and floor plate which I will now describe referring to the accompanying drawings forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is a plan view of my novel floor plate, the members being in the assembled position;

Fig. 2 a corresponding inverted plan view;

Fig. 3 an edge view corresponding with Fig. 1;

Fig. 4 a section on the line 4—4 in Fig. 2, looking in the direction of the arrows;

Fig. 5 an inverted plan view showing a pipe in section and showing the position of the members at the beginning of the assembling operation.

Fig. 6 a similar view showing the members in the assembled position and showing the action of the springs in retaining them locked together.

Fig. 7 a view partly in elevation and partly in section on the line 7—7 in Fig. 1, looking in the direction of the arrows;

Figs. 8 and 9 views corresponding with Figs. 1 and 2, illustrating a modified form of spring, and a modified form of keeper;

Fig. 10 a section on the line 10—10 in Fig. 8 looking in the direction of the arrows;

Fig. 11 an inverted plan view showing the position of the members before the passage of the tongues into the keepers;

Fig. 12 a detail perspective view on an enlarged scale showing a tongue and housing in disassembled relation, and

Fig. 13 is a perspective view illustrating another modified form of spring.

20 denotes the interchangeable members which are blanked out and formed from sheet metal. Each member is provided with the usual semi-circular recess, said recesses together forming a central opening 21 adapted to receive a pipe 22, on one side of the recess with a forwardly projecting tongue 23, and on the other side of the recess with a keeper 24 which is adapted to be engaged by the tongue of the coöperating member. At the edge of each semi-circular recess is a downwardly turned flange 25 and at the outer edge of the member is a downwardly turned flange 26.

When the members are in the assembled position and the plate as a whole is in the horizontal position, as when lying on a table, the inner edge of each member, that is at the central opening, is appreciably higher than the outer edge, the top of the plate inclining downward and outward from the curve at the intersection of flange 25 with the top to the curve at the intersection of flange 26 with the top. Each tongue is offset from the plane of the top to adapt it to engage a keeper, leaving a shoulder 28 at the intersection of the tongue with the edge of the member. The height of the shoulder is greatest at the inner edge of the tongue, see Fig. 12, so that the tongue instead of lying parallel with the plane of the top will lie obliquely thereto and approximately in

the horizontal plane, the purpose of which will presently be explained. The configuration of the tongues is substantially the same in the several forms. I have shown the tongues as shaped like a blunt and rounded spear point. Each tongue is provided in its outer edge contiguous to the edge of the member with a locking notch 27 which is adapted to coöperate with a locking wall 29 on a keeper.

The shape of the keepers may vary considerably without departing from the principle of the invention, it being simply necessary that they be adapted to serve as guides for the tongues in assembling and that each keeper be provided with a locking wall adapted to coöperate with the locking notch in the corresponding tongue. Each keeper is formed from metal projecting from the edge of the member which is folded over under the member leaving a space to receive a tongue between the keeper and the under side of the member. In the form illustrated in Figs. 2, 5, 6 and 7, the keeper is joined to the member by a strap of metal, indicated by 32, which forms an approximately vertical wall, the inner edge of which serves as the locking wall 29. In order to insure that this wall will be approximately vertical when the members are formed by automatic machinery, I form a slot 30 at the intersection of the strap with the keeper, before the keeper is folded under the edge of the member, one wall of this slot, in the finished member, forming the top of the locking wall. The effect of this slot is to prevent distortion of the metal at the corner in bending the keeper to a position at right angles to the strap, thus leaving the locking wall vertical. For convenience in assembling, the outer free edge of the keeper is flared outward slightly at the corner, as at 31, which facilitates entrance of the tongue.

The form illustrated in Figs. 9, 11 and 12 differs in that each end of the keeper is attached to the member by a strap 32. Locking wall 29 is the same as before but instead of slot 30 I form a much larger and rounded slot 33 in the keeper, and in order to facilitate the entrance of the tongue I flare the metal outward, as at 34.

As ceiling and floor plates are necessarily made larger than the pipes they inclose, it is customary to provide the members with springs which grip the pipe with sufficient power to hold the plates securely in place and to prevent rattling. An important feature of my present invention is that I provide the members with springs which act in a line parallel, or nearly so, with the line of movement in locking the members together, so that the resultant force holds the members locked together and also avoids any tendency of the members to buckle in assembling. In the form illustrated in Figs. 1, 2, 4, 5 and 6 I use a wire spring 36 which is attached to the back of flange 25 by a lip of metal, indicated by 35, which is clamped down upon the wire and holds it firmly. The ends of the spring are curved and recurved to form contact points 37 and 38 which pass through slots 39 in flange 25 and bear against the pipe when in use. An important feature of the invention is that one of the slots 39 and the corresponding contact point in each member are placed relatively near one end of the flange so that the spring action will be substantially parallel to and in the direction of movement of the members in locking them together, the springs then acting to retain them locked together. The form illustrated in Figs. 8, 9, 10 and 11 differs in that sheet metal springs are used which are formed integral with the members, each spring consisting of a curved neck 40 which extends from flange 25 and is provided at its free end with a bearing plate 41 which lies approximately parallel with flange 25 and is curved to correspond approximately with the size of pipes for which the plate is intended. In this form one end of the bearing plate extends beyond the member, thereby securing to the fullest extent a resultant force acting in the line of the locking movement of the members in placing a plate upon a pipe.

The form illustrated in Fig. 13 differs in that the spring 42 is formed from flange 25 itself, the flange being separated from the member at the line of intersection for half, more or less, of its length and sprung inward slightly, as clearly shown in Fig. 13, thereby securing the same spring action in the assembled position of the members as in the other forms.

The operation of assembling the members and locking them together is the same in each of the several forms, it being immaterial whether the keeper is attached to the edge of the member by one strap or two. The relative position of the locking walls on the keepers and the locking notches in the tongues, see Figs. 5 and 11, is such that the ends of the members, when first brought into contact with each other, must be a distance out of alinement corresponding with the depth of the locking notches in the tongues, a lateral movement of the members relatively to each other being required to complete the locking operation. It has already been explained that the tongues instead of lying parallel to the plane of the top of the plate lie obliquely thereto and in approximately a horizontal plane, so that when the tongues have been passed into the keepers and the lateral locking movement is given to the members the tongues will ride down the inclined under sides of the members and will be thereby sprung slightly

out of their normal plane, the effect of this binding action being to prevent rattling of the members and retain them in the locked position by the friction of the tongues on coöperating members. This frictional engagement is sufficient to keep the members locked together under ordinary handling. When the members are in place on a pipe the frictional engagement of the tongues with the members is supplemented by the action of the springs which are so situated as to have a resultant force parallel to and in the direction of the locking movement.

Having thus described my invention, I claim:

1. A plate of the character described comprising members, each provided with a tongue having a locking notch and a keeper having a locking wall, the wall and notch of complementary members engaging by lateral movement, each member inclining downward from inner to outer edge, and each tongue being offset and lying considerably obliquely to the incline so that the locking movement will produce a binding action between the tongues and the inclines of complementary members and hold the members in engagement.

2. A plate of the character described comprising the combination with members, each provided with a tongue having a locking notch and a keeper having a locking wall, the top of each member inclining downward from inner to outer edge and each tongue lying considerably obliquely to the incline, of pipe engaging springs relatively near one end of each member and acting in the line of the locking movement.

3. A plate member of the character described having a semi-circular recess, upon one side of said recess a tongue having a locking notch and upon the other side of said recess a keeper having a locking wall, the top of the member inclining downward and outward from the recess to the edge and the tongue being offset and lying considerably obliquely to the incline.

In testimony whereof I affix my signature.

ARTHUR C. GAYNOR.