

March 6, 1951

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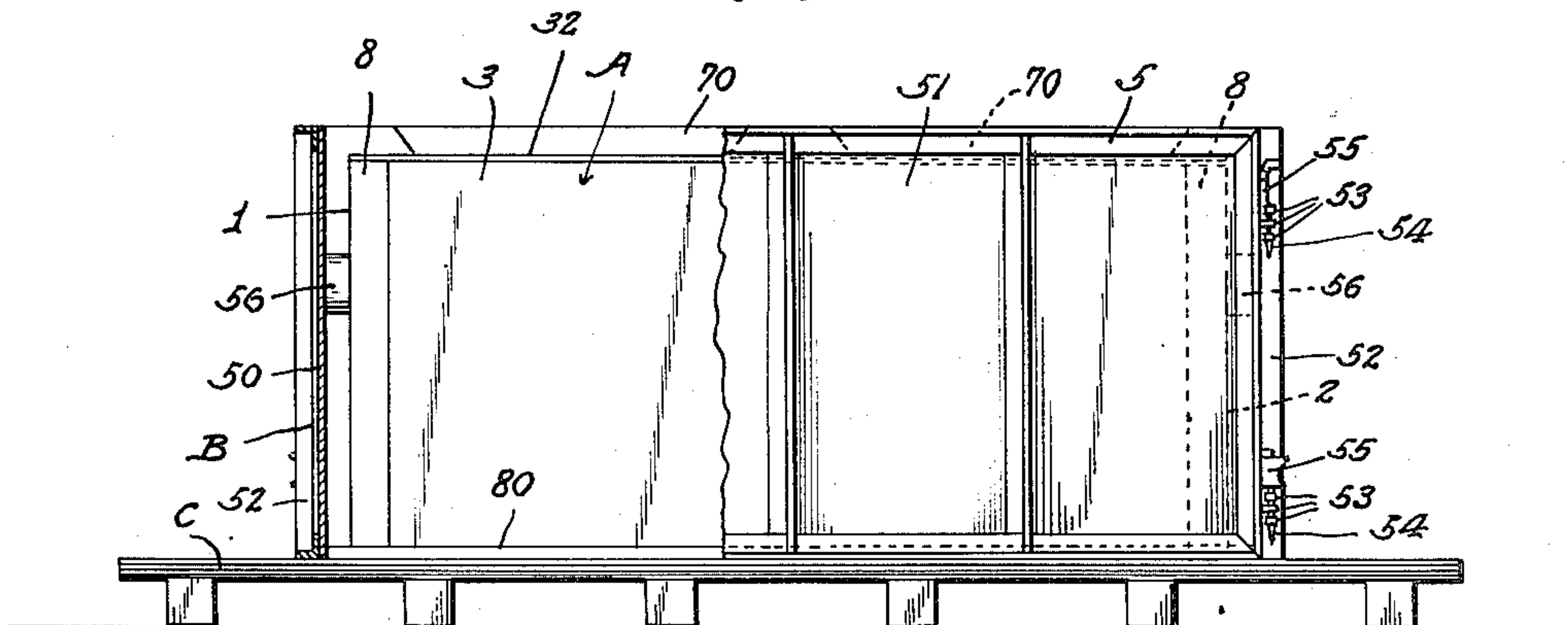
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INNER COLLAPSIBLE MOLDING FORM

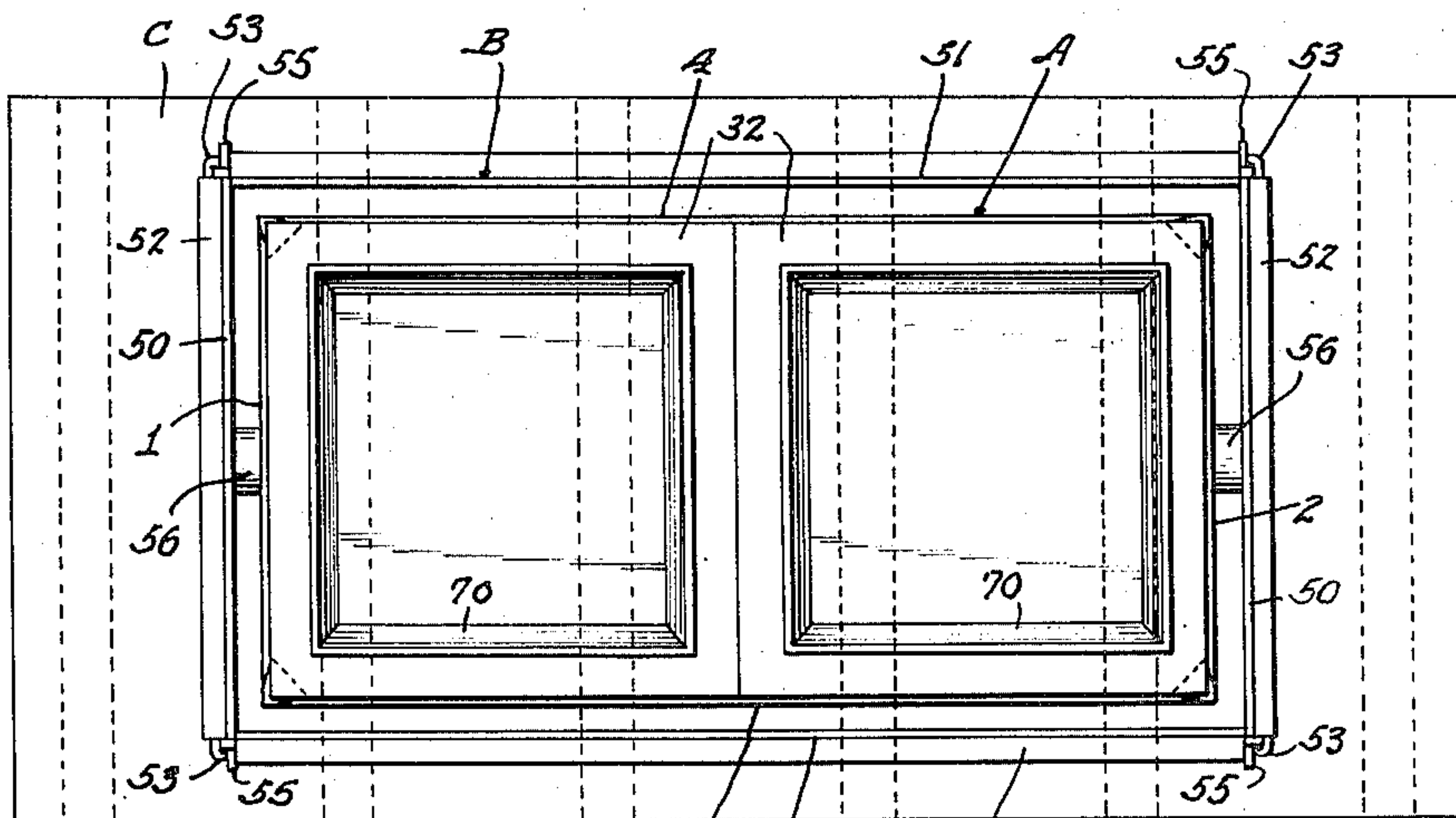
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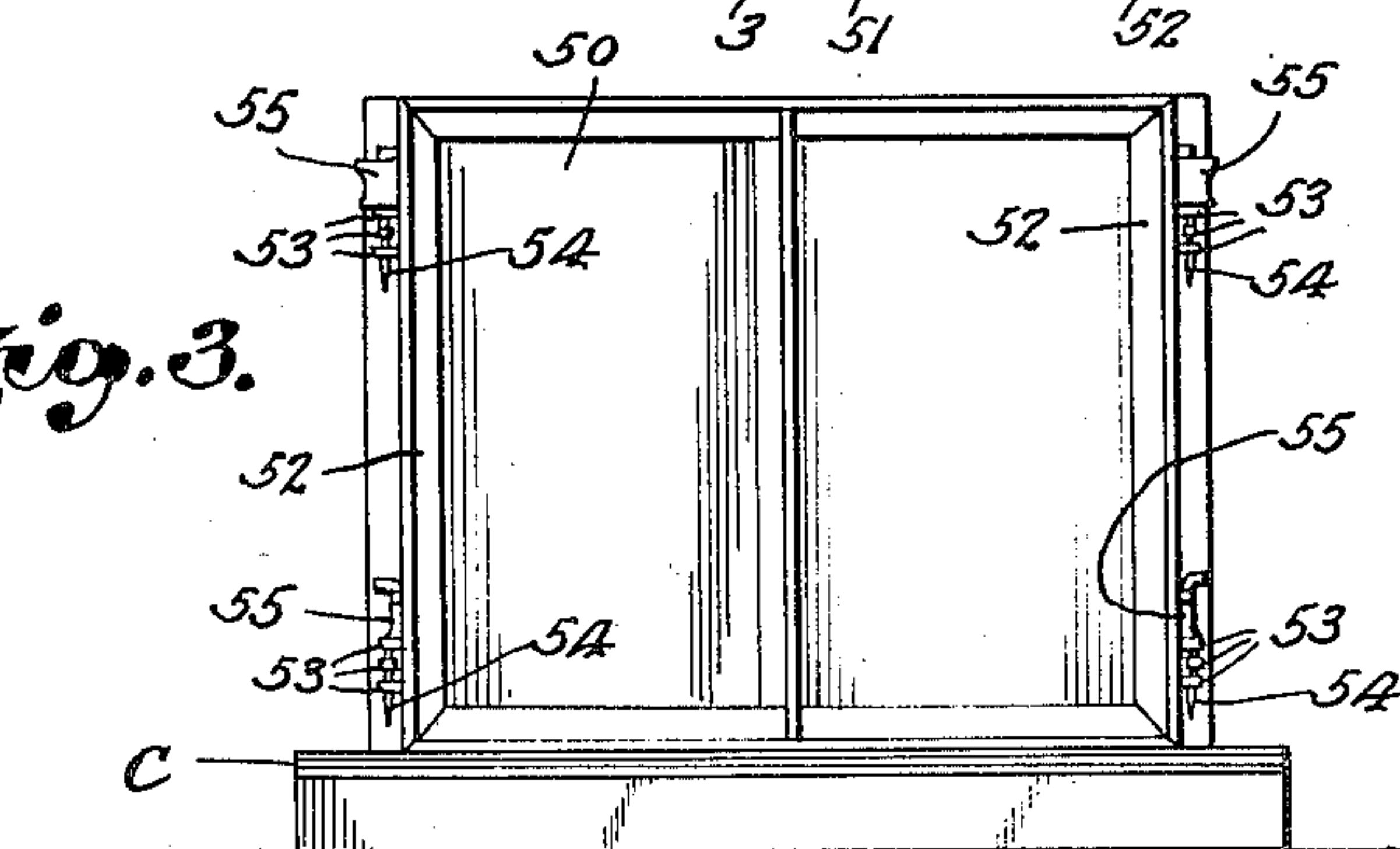
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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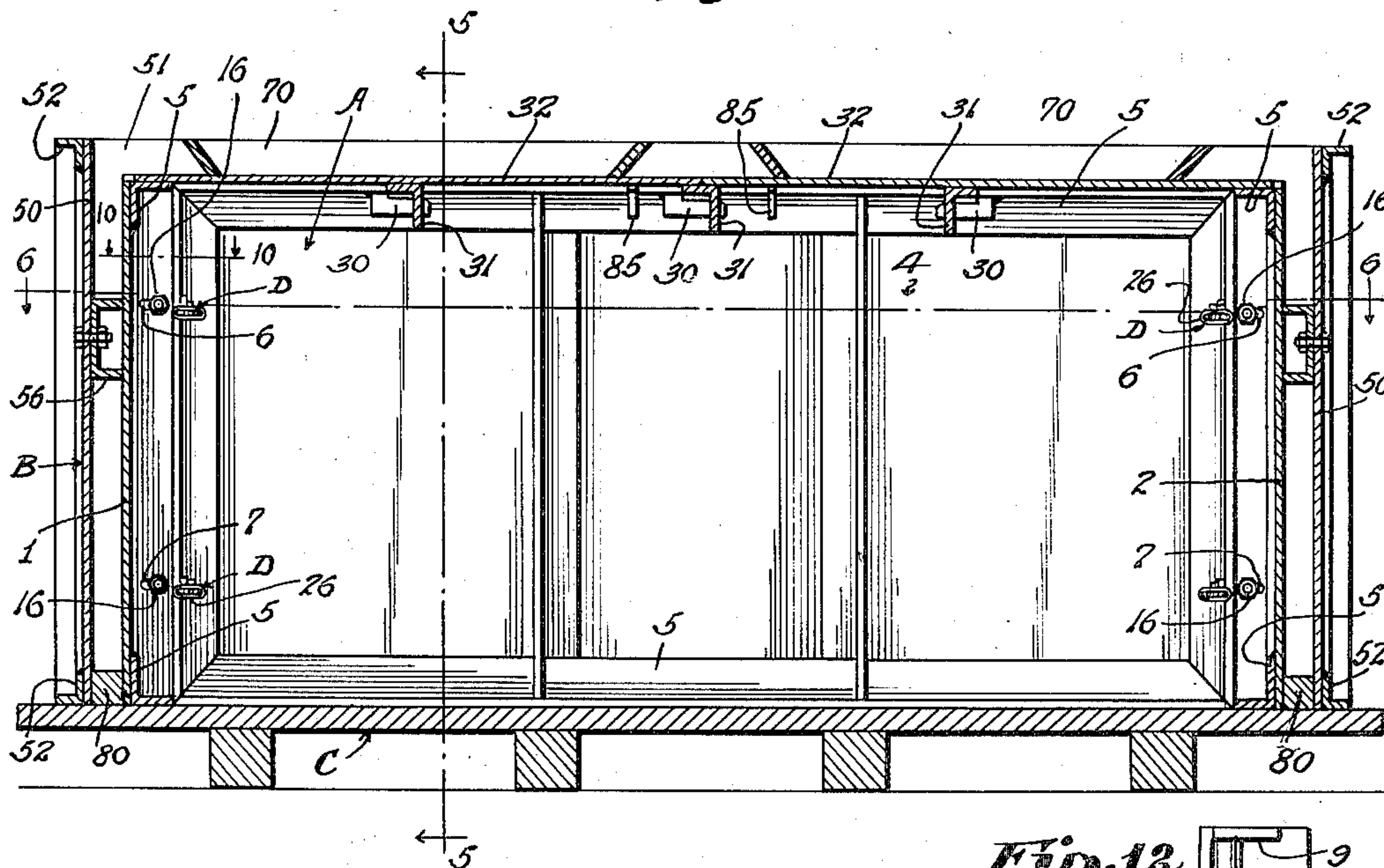
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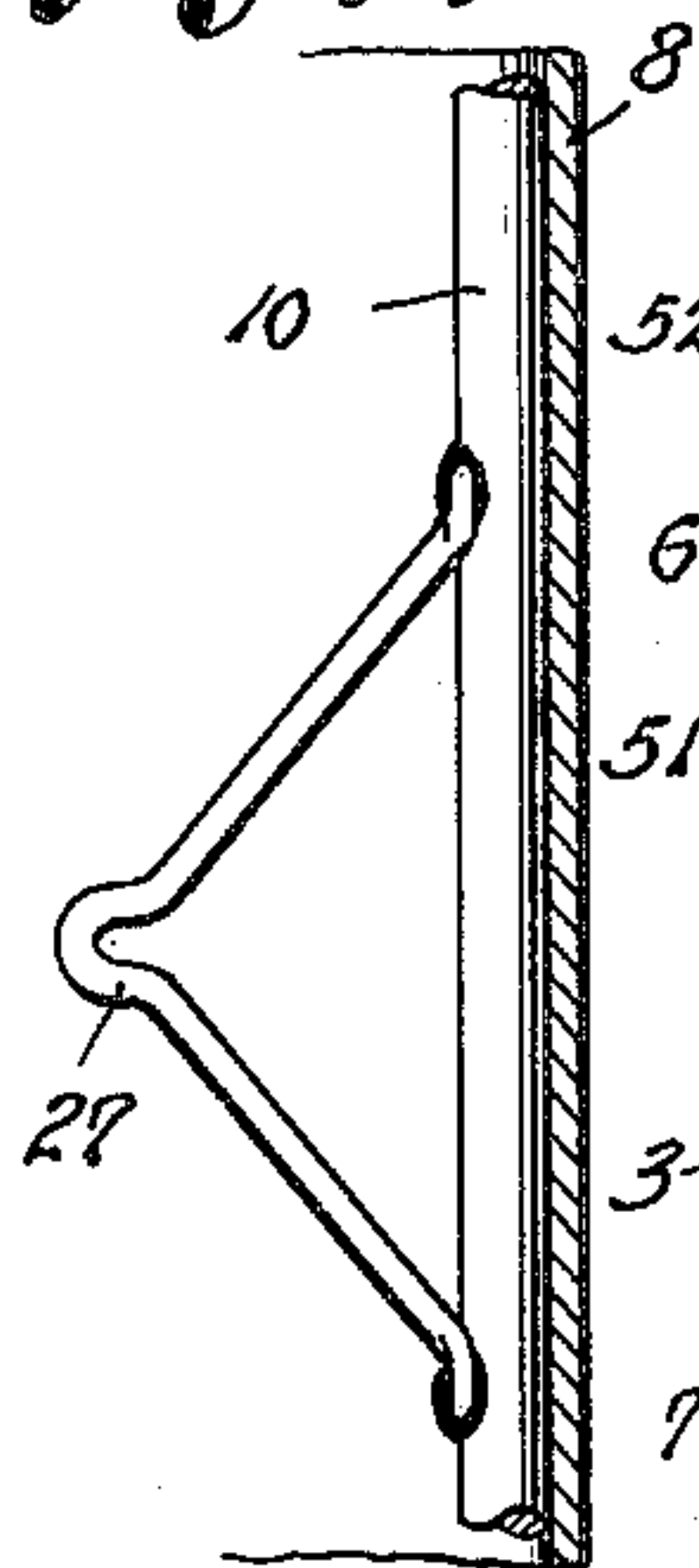
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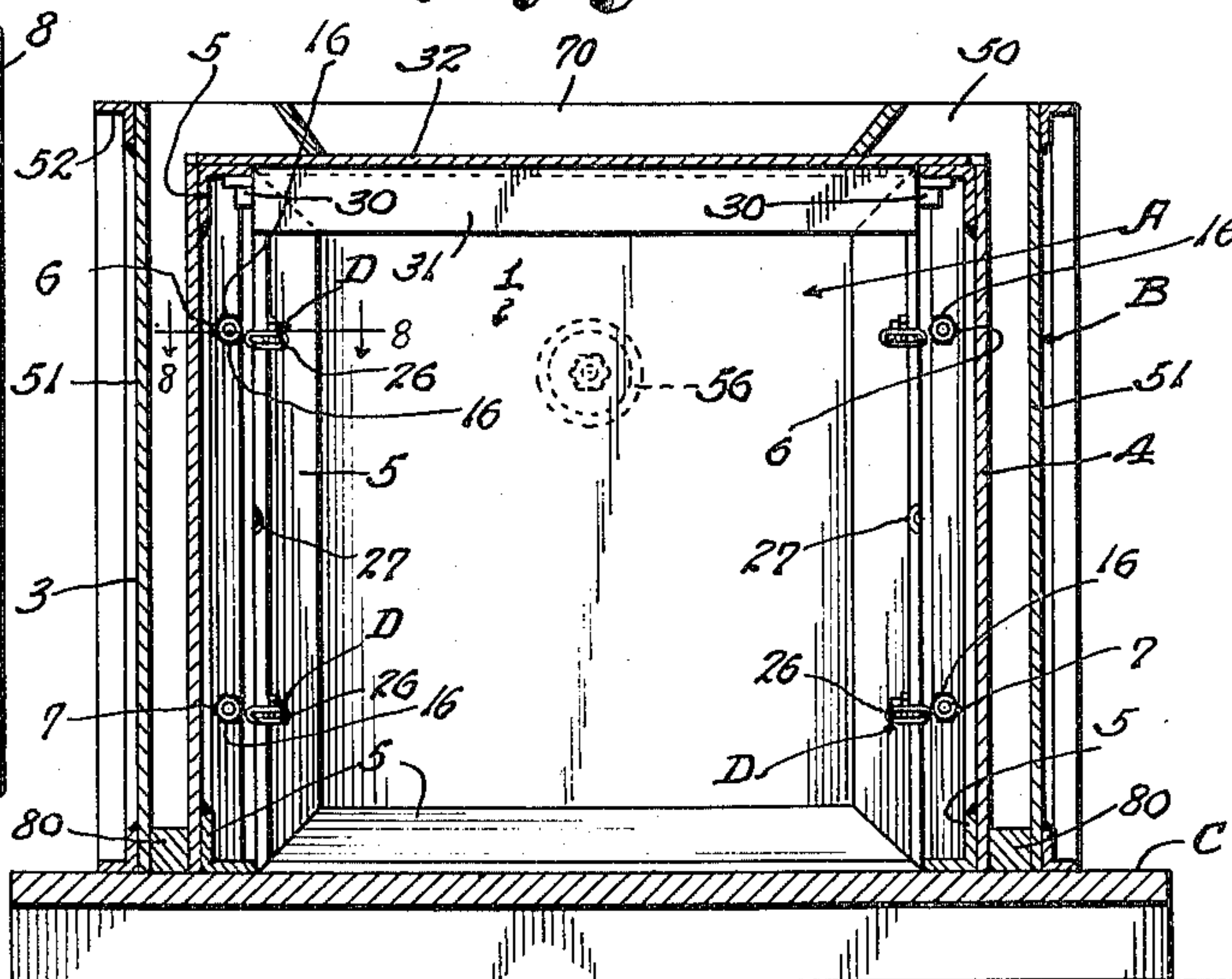
*Fig. A.*



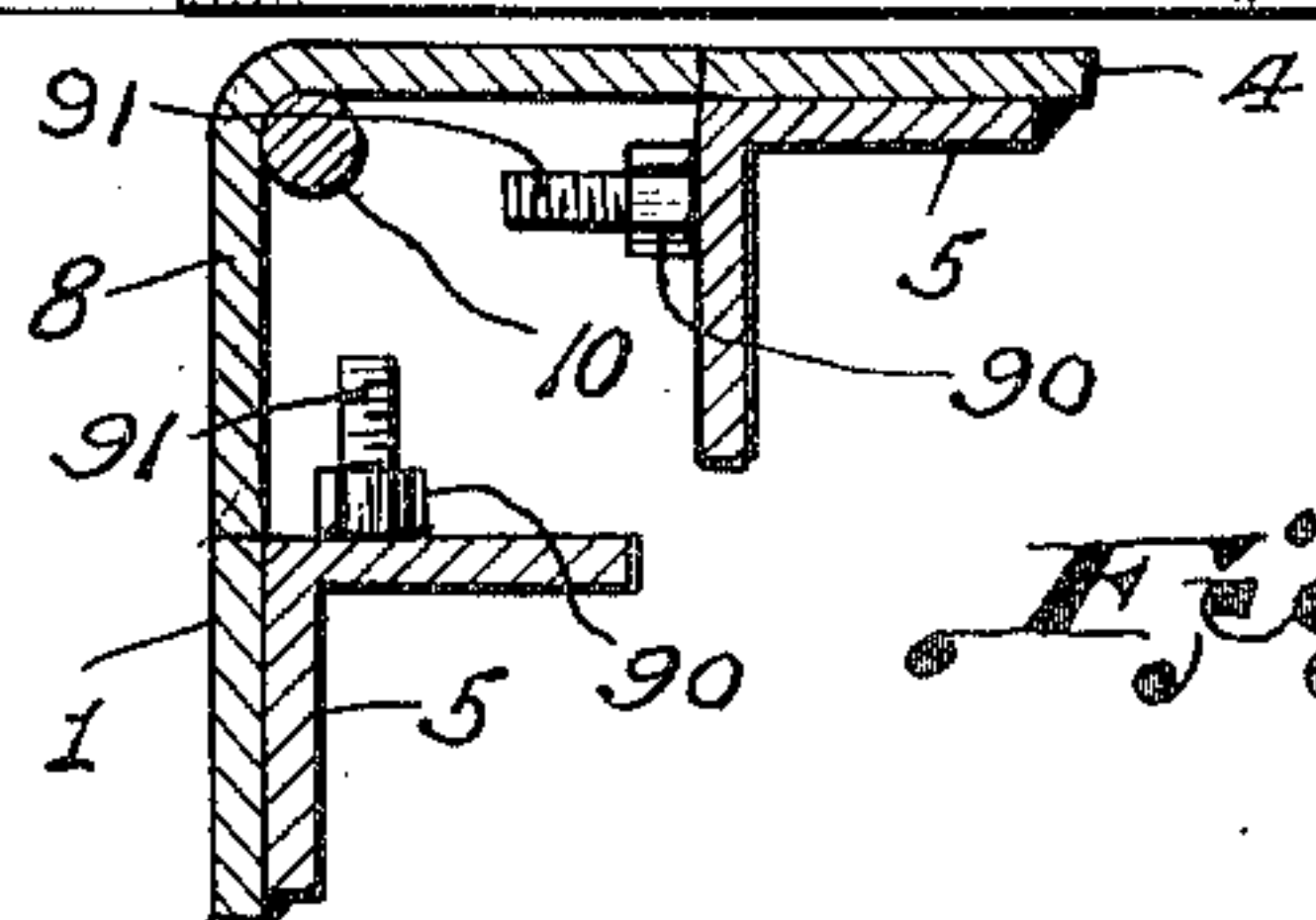
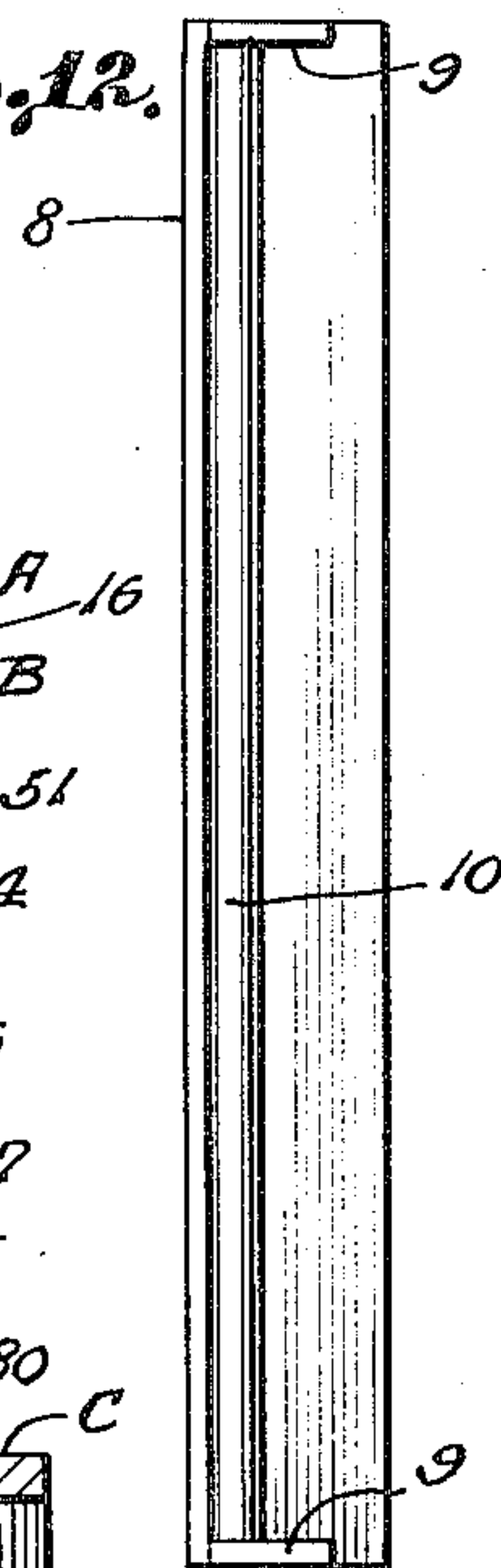
*Fig. 11.*



*Fig. 5.*



*Fig. 12.*



*Fig. 10.*

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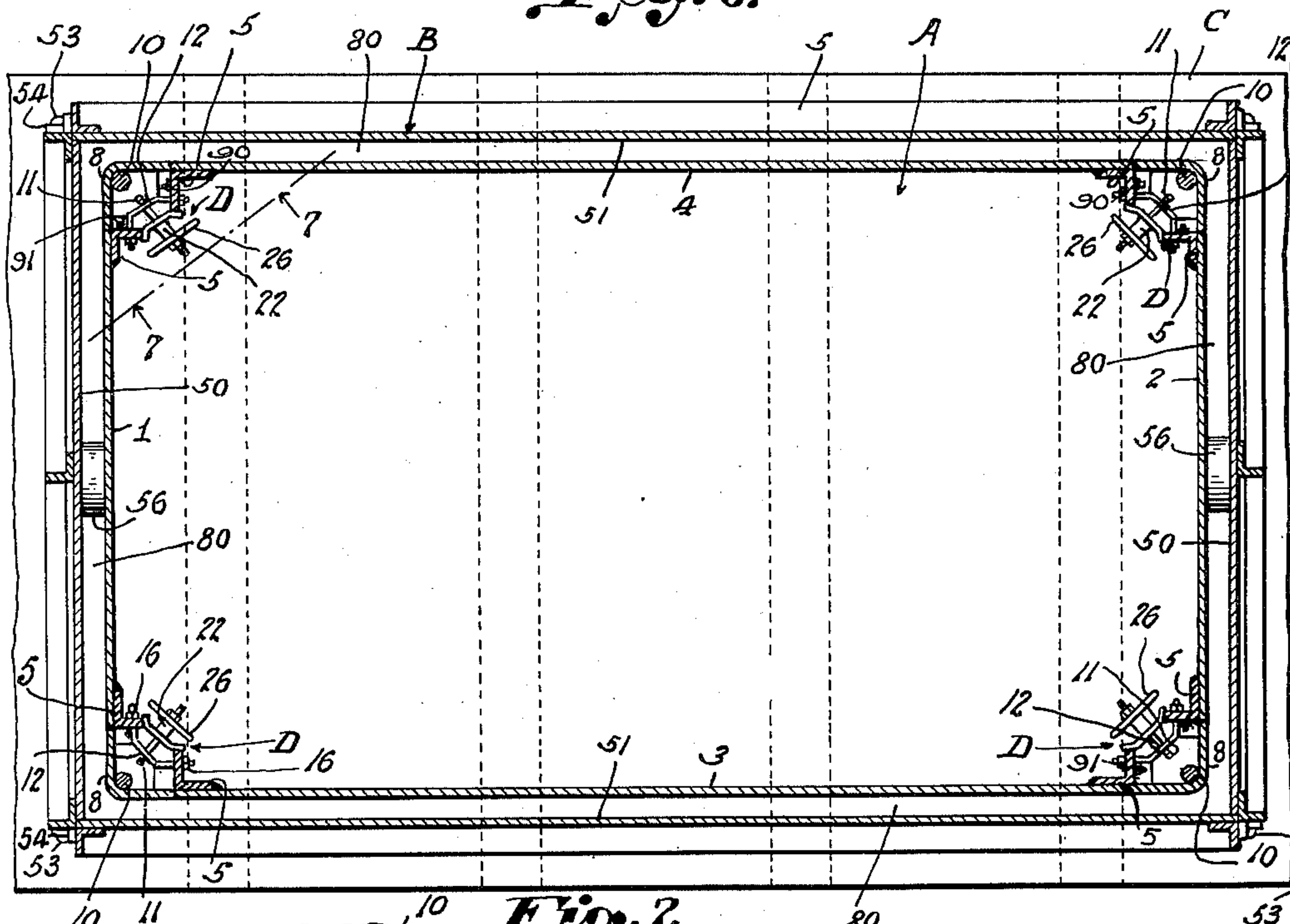
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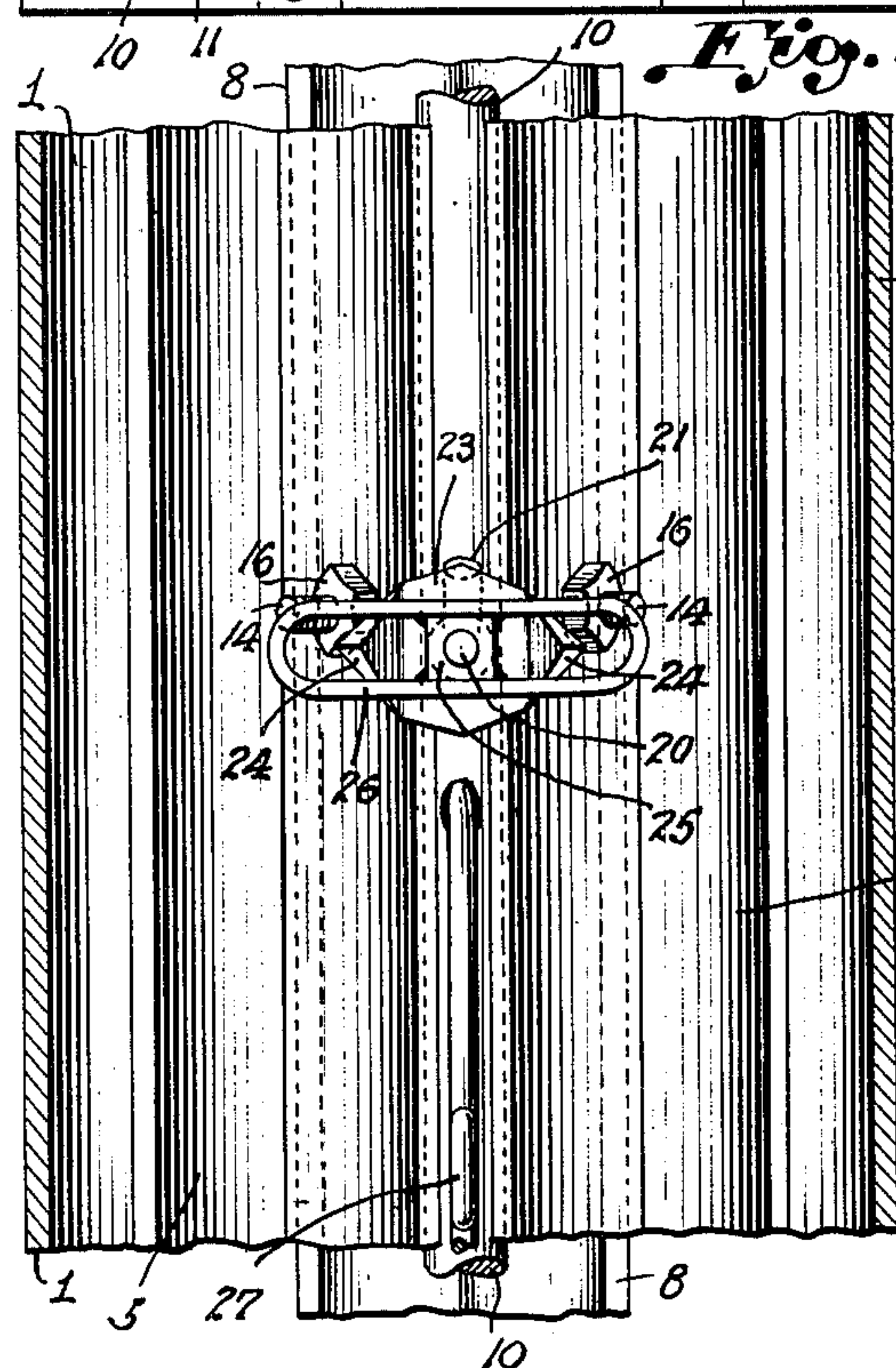
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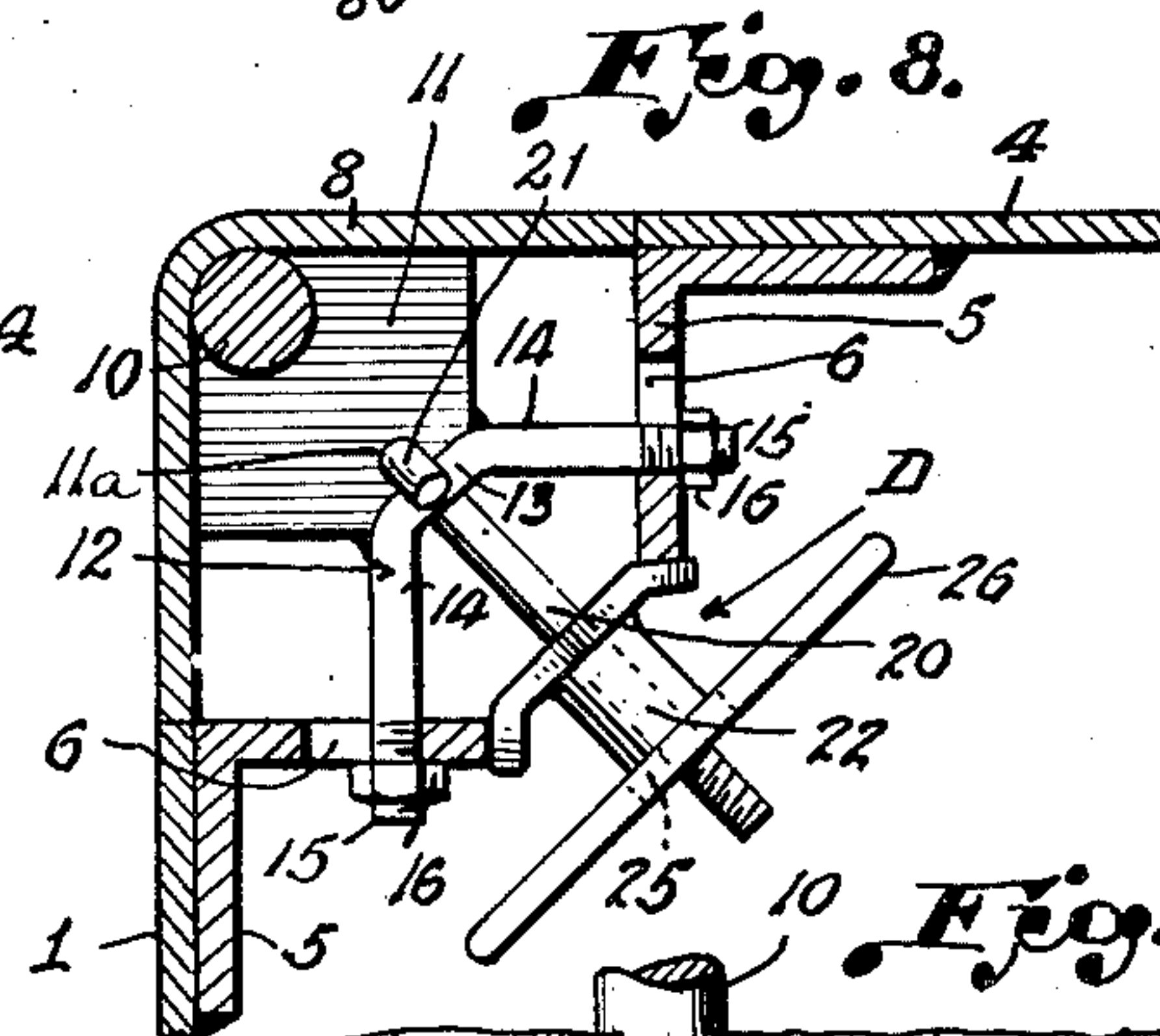
*Fig. 6.*



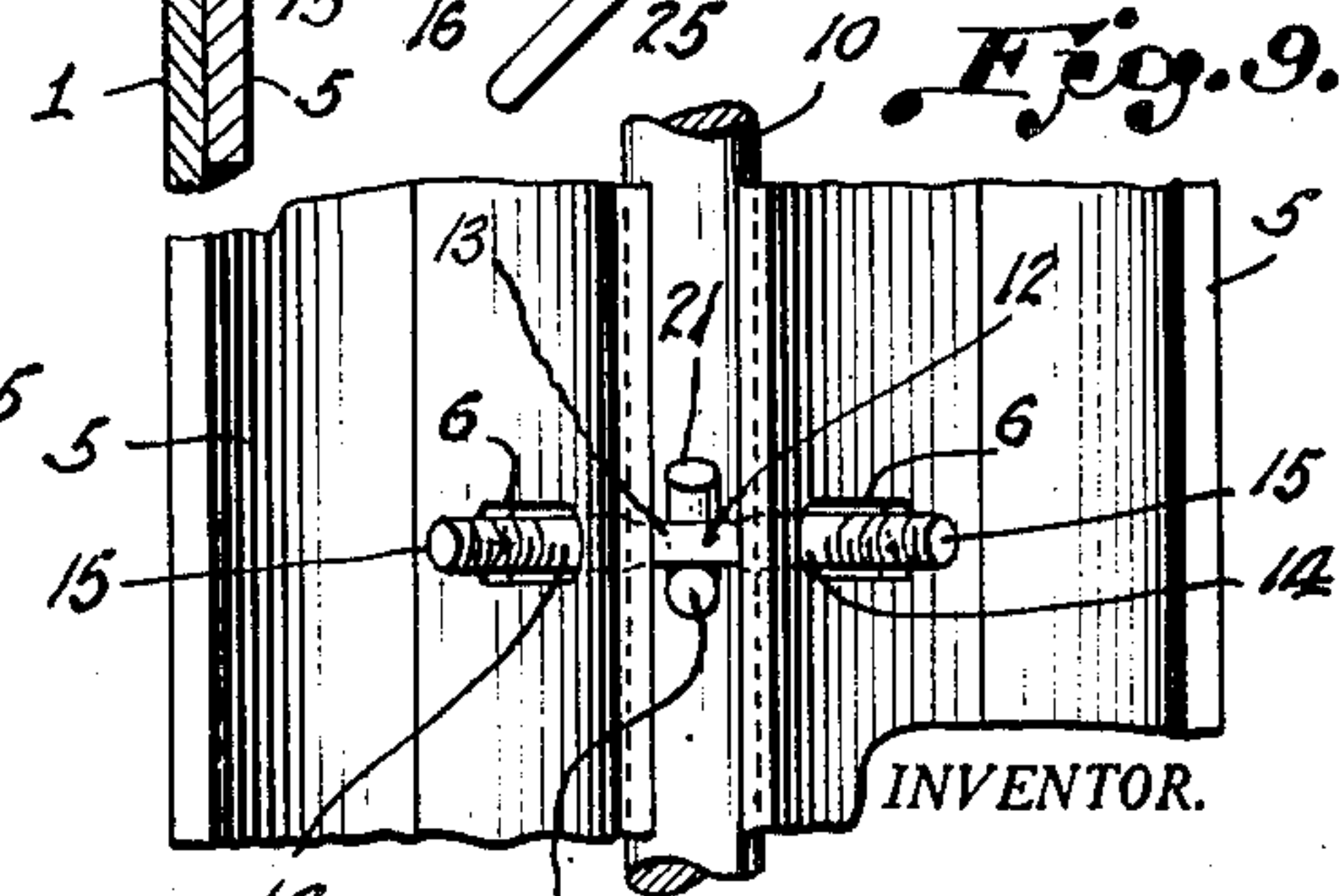
*Fig. 7.*



*Fig. 8.*



*Fig. 9.*



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## UNITED STATES PATENT OFFICE

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## INNER COLLAPSIBLE MOLDING FORM

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Application December 29, 1948, Serial No. 68,013

4 Claims. (Cl. 25—130)

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This invention relates to new and useful improvements in apparatus for pouring and forming septic tanks, catch basins and like receptacles.

The primary object of this invention resides in the provision of novel and useful improvements in apparatus for pouring and forming receptacles which can be easily and quickly cast from concrete or like material at a central plant or factory and transported to the point of installation.

Another important object of this invention lies in the provision of concrete receptacle moulding apparatus which may be quickly and easily assembled for the pouring of concrete, and the provision of such moulding and forming apparatus which is employed in an inverted position during the pouring operation. By being inverted during the pouring operation, this apparatus permits the rapid pouring of the concrete and it alleviates the necessity of having to handle by hand, with shovel, concrete necessary to fill the narrow opening in the forms moulding the sides and ends, or pouring concrete down inside the forms to cast the bottom.

Still a further and extremely important object of this invention lies in the simplified assembly of the apparatus which permits the form to be rapidly and easily set up for pouring. In addition, the structure is provided with improved means for interlocking the numerous parts in such a manner so that they may be rapidly and easily dismantled from a set mould.

Still another provision of this invention is the assembly of a pouring mould apparatus which forms a complete unit for casting a receptacle complete with manholes and manhole covers, inlets and outlets all at a central point from which they may be delivered to the point of installation. There is no necessity of relying on a ground mould or outside form at the place of installation, and hence those receptacles which can be cast in the disclosed type of mould forms may be more easily and economically constructed at a saving of annoyance and money for the consumer.

Still further improvements and objects of the present invention will become readily apparent to those skilled in the art when the following description is studied in the light of the accompanying drawings.

In the drawings:

Fig. 1 is a side elevation of the assembled form with parts broken away for clearer illustration.

Fig. 2 is a top plan view of Fig. 1.

Fig. 3 is an end view of Fig. 1.

Fig. 4 is a longitudinal section through the assembled form.

Fig. 5 is a section taken on line 5—5 of Fig. 4.

Fig. 6 is a section taken on line 6—6 of Fig. 4.

Fig. 7 is a sectional view taken on line 7—7 of Fig. 6.

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Fig. 8 is a sectional view taken on line 8—8 of Fig. 5.

Fig. 9 is a view similar to Fig. 7 with parts broken away and omitted.

Fig. 10 is a sectional view on line 10—10 of Fig. 4.

Fig. 11 is a detail section of part of one corner piece.

Fig. 12 is a view of one of the corner pieces with parts omitted.

Referring now to the accompanying drawings in which like characters indicate similar parts throughout, the forming apparatus consists of two basic units, the inner form A and the outer form B, both of which are used in conjunction with a pouring platform C.

The inner form A consists of two steel end plates 1 and 2 and two steel side panels 3 and 4. Both the end plates and the side panels are provided with angle iron frames 5 to which they are welded or secured in some like manner. Each of the vertical members of the frames of both the side panels and the end plates is provided, on the angular portions thereof which extend inwardly, with two laterally elongated holes, the upper holes 6 being equally spaced from the tops of the frames, and the lower holes 7 being spaced equally from the bottoms of the frames.

Four corner pieces 8 are provided with the inner form, each piece consisting of an enlarged length of angle iron having bent-over portions 9 enclosing the ends thereof. An elongated bar 10 is welded in the V of each corner piece to extend between the enclosing portions 9, and secured within the angle of the corner pieces and spaced from the ends thereof at distances apart equal to the spaced distances between the holes 6 and 7 in the end and side frames are small plates 11 provided with a hole 11a disposed axially with the longitudinal axis of the corner piece. Secured, by welding or the like, to each of these small plates 11 is a retainer bolt 12 consisting of a straight portion 13 centrally of the bolt formed with two off-set end portions 14 projecting at substantially 45 degree angles from the central portion. The extremities of these off-set ends are provided with screw thread sections 15 extending for a spaced length therealong.

When the corner pieces are positioned vertically adjacent the corners formed by the loose junctures of the vertically disposed and positioned side panels and end plates, the threaded ends of the retainer bolts 12 project one through each of the adjacent elongated holes, 6 or 7, in the adjacent frame piece, and by threading lock nuts 16 on these ends, where they project beyond the frames, the corner piece can be secured in such a manner as to form a substantially finished outer corner surface between the respective side and end form pieces.



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In addition, two corner locks D are provided with each corner piece to be used in locking the corner pieces in place. When the corner pieces are secured by virtue of the retainer bolts, they are free to be moved laterally within the limits of the length of the elongated holes 6 and 7. This freedom of movement is important in permitting an expanding action between the sides and ends and the corner pieces which will be explained later in the operational description.

The locks D each consist of an elongated threaded stud 20 provided at one end with a hook-shaped termination 21. Slidable on this stud 20 is a tubular housing 22 provided at that end adjacent the hook 21 with a substantially diamond-shaped flange 23. Two diametrically opposed points, 24, of the flange 23 are offset at an angle away from the hooked end. Finally a nut 25, provided with a closed, oval, wire-like loop 26 welded across two opposed edges of the nut to extend therebeyond, is threaded over the end of said stud to selectively abut with that end of the tubular housing remote to the flange 23.

The lock D is employed to securely lock the corner piece in a close adjacent position with its adjoining side and end closure member away from what will be the expanded position. To secure the lock, the lock nut 25 and the tubular housing 22 are backed away from the hooked end 21 of the stud 20. The hooked end 21 is then inserted between the side frame pieces of adjacent side and end form panels to engage the hole 11a in the plate 11 of the corner piece. The tubular housing 22 is moved toward the hooked end to a position where the offset points 24 of the flange 23 abut one with each of the adjacent frame pieces. Then by taking up on the lock nut 25, the housing may be used in abutment with the side frames to draw the corner piece tightly inward to a close position between the adjacent frames and provides a flush outside corner surface between the side panel and the end plate. The purpose of the enlarged oval loop 26 is to provide a means to facilitate the application of force in taking up on the lock; a wing nut or like structure would satisfy as an equivalent. Thus, when the lock has been applied the corner piece has been drawn inward to a position where the projections 14 of the retainer bolt 12 are as far toward the inner limits of the elongated holes 6 and 7 as they can move.

To complete the inside form apparatus, there are two remaining elements. First, there is provided on each corner piece a substantially V-shaped metallic loop 27 which is secured by welding or the like at two vertically spaced points on the bar 10 of each corner piece to project the closed portion thereof outwardly and diagonally into the interior of the assembled inner form.

Secondly the upper rails of the frames of the side panels are provided, in opposed positions on their inner faces, with receiving plates 30 which are adapted to removably support cross bars 31 therebetween which in turn support the top plate 32 which rests thereon.

The outer form B consists of two end plates 50 and two side panels 51. These end plates and side panels are framed, 52, as are the inner form side and end pieces. These outer form members are disposed in positions forming a closed rectangular outer form.

The vertical edges of the side panel and end plate frames are provided with closed metallic eyes 53 secured thereto to extend perpendicularly from the frame edges. The eyes of the

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side panel frames are staggered vertically with respect to the eyes of the end plate frames. Hence, when the form is assembled, the eyes of adjacent side and end frames interfit as shown to have a common vertical axis.

Tapered steel pins 54 each provided with an enlarged head 55 are inserted downwardly through the aligned eyes of the side and end frames to lock the outer form in a quickly disengageable assembled form.

It is to be understood that the outer form members are sufficiently greater in over-all measurements than the inner form at a predetermined degree so that the outer form may enclose the inner form so that, when they are concentric, a space will be provided between them equal to the desired thickness of the tank walls, and the outer form extends to a proper distance above the top of the inner form top plate 32 to form the tank bottom of a proper thickness.

In addition, circular spacers 56 can be provided on the inner face of the outer form to permit the integral moulding of inlet and outlet ducts in the finished product. These spacers comprise slightly tapered circular metallic members of predetermined diameter, and of a length equal to the desired thickness of the walls.

They are bolted to the inner face of the outer form and project horizontally to abut with the outer surface of the inner form when the apparatus is assembled. In this manner they exclude concrete from the circular portions of the tank wall forming circular ducts or passages through the wall when the material has set.

A last feature of construction lies in the provision of manhole moulds 70. These moulds are formed of pan-like steel members with upwardly and outwardly inclined sides formed on a reasonably accurate scale.

In operation a pouring platform C is seated horizontally. This platform is provided with a raised rectangular sill 80 which is of a lateral thickness equal to the desired thickness of the cast receptacle walls. The sill may be stepped intermediate its width if a stepped seat top edge is desired on the receptacle.

The inner form is set up on the platform within the confines of the sill 80 and the retainer bolts 12 are employed for the initial interlocking of the sides and ends with the corner pieces as described. The locks D are then applied to securely interlock the several parts which abut tightly with the inner face of the sill 80.

The outer form is then secured in tight fit about the outer edge of the platform sill and is locked in place by application of the tapered pins 54 which are wedged into the aligned eyes 53 of the side and end frames.

The cross bars 31 are inserted in the inner form, and the top plate 32, provided with plural eyes 35, is laid over the support bars with the eyes 35 downwardly disposed in the inner form. Lastly, the manhole moulds are seated on the top surface of the top plate 32.

The green concrete is then poured in in sufficient quantity to fill the wall spaces between the inner and outer forms and to lay on the top plate to a depth leveling off even with the top of the outer form. Likewise the manhole mould pans are filled forming a removable manhole cover for the manhole formed by the manhole mould pan. After the green concrete begins to set, manhole cover handles may be inserted in the soft concrete in the mould pans and permitted to harden in place.



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When the moulded tank has set, the outer form is easily removed from the mould by removal of the tapered pins 54. The tank, with inner form still in place, is then lifted and carried to a storage place where it is seated in an inverted position disposing the open top upward.

The locks D are then removed as are the now upwardly disposed cross bars 31. Then the form sides and ends are moved inwardly by prying inwardly on the nuts 90, using the surface of the adjacent corner piece as a fulcrum. The nuts 90 are threaded on the studs 91 which extend outwardly from the end of the side frames 5 at spaced distances below the tops of said frames. These sides are moved inwardly in the movements of members 14 within the limits of the elongated holes 6 and 7 with which they have sliding engagement.

The last step in the quick dismantling of the moulding form apparatus consists in fastening chain hooks in the corner piece loops 27 and in the top plate eyes 85 and jerking the inner form and top plate free of the moulded tank, after which the form is returned to the pouring platform and reassembled for another pouring operation.

It can now be seen that a novel and useful moulding apparatus has been provided which greatly facilitates the mass production of cast concrete and aggregate receptacles at a minimum of labor and expense.

It is to be also understood that the structure is capable of all modifications and variations which fall within the scope of the hereinafter appended claims.

Having fully described and disclosed my invention, what I desire to claim in Letters Patent is:

1. In a molding apparatus which includes a pouring platform, a continuous raised sill carried on said platform, and an outer form assembled to stand vertically on said platform adjacent the outer periphery of the sill, an inner collapsible form adapted to stand vertically about the inner periphery of the sill, comprising, a plurality of independent wall members arranged in angular disposition, independent corner pieces disposed at the lines of divergence of the wall members, said wall members having spaced pairs of elongated slots formed therein, said corner pieces having spaced studs coinciding with the elongated slots of said wall members, each of said corner piece studs being slidably retained in a corresponding wall member slot by a nut threaded thereon, lock members carried by the corner pieces engaging the wall members and locking them in selected adjusted positions relative to the corner pieces, angular pulling bars carried by the corner pieces to extend inwardly of the wall members, and a cover for the form supported from said wall members.

2. In a molding apparatus which includes a pouring platform, a continuous raised sill carried on said platform, and an outer form assembled to stand vertically on said platform adjacent the outer periphery of the sill, an inner collapsible form adapted to stand vertically about the inner periphery of the sill comprising, a plurality of separable wall members arranged in angular end to end disposition, said wall members provided with angular frames, independent corner pieces disposed at the lines of divergence of adjacent wall members, said corner pieces comprising elongated angle iron bars closed at each end and provided with longitudinally spaced plates secured within the angles thereof, holes

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formed centrally in said plates, closed rigid loops carried by said pieces and extending inward of said form, substantially U-shaped studs threaded at each end and secured transverse said pieces in spaced relationship, transversely elongated slots formed in said inner form wall frames and disposed to receive the threaded ends of said adjacent studs, lock nuts for said studs to adjustably interconnect each corner piece with the adjacent form walls, and lock mechanisms for locking said corner pieces and said adjacent walls in adjusted positions.

3. A structure as defined in claim 2 wherein said lock mechanism includes, an elongated threaded stud provided with a hook terminating at one end thereof, a tubular housing slidable on said stud and provided with a substantially diamond-shaped flange at that end thereof adjacent the hook, two diametrically opposed points of said flange being off-set away from said hook, a threaded lock engaging said stud and abutting said housing, said hook engaging in a plate hole in the corner piece, the off-set flanges abutting the adjacent wall frames, and the threaded lock forcing said flange to an extreme position toward the hooked end for the purpose described.

4. In a molding apparatus which includes a pouring platform, a continuous raised sill carried on said platform, and an outer form assembled to stand vertically on said platform adjacent the outer periphery of the sill, an inner collapsible form adapted to stand vertically about the inner periphery of the sill, comprising, a plurality of independent wall members arranged in angular disposition, independent corner pieces disposed at the lines of divergence of the wall members, said wall members having spaced pairs of elongated slots formed therein, said corner pieces having spaced studs coinciding with the elongated slots of said wall members, each of said corner piece studs being slidably retained in a corresponding wall member slot by a nut threaded thereon, lock members carried by the corner pieces engaging the wall members and locking them in selected adjusted positions relative to the corner pieces, angular pulling bars carried by the corner pieces to extend inwardly of the wall members, a cover for said form supported from the wall members thereof, plural pan-like structures open at both ends seated on said cover in spaced relationship, and the walls of said pan-like structures tapering upwardly and outwardly from said cover and adapted to receive green concrete therein and thereabout.

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