Sept. 3, 1957 F. J. ZAVADA 2,804,641

HINGE JOINT

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Fig. 1

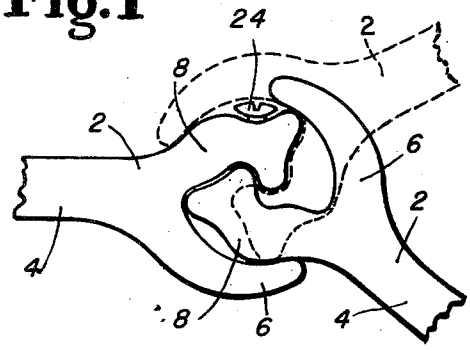



Fig. 2

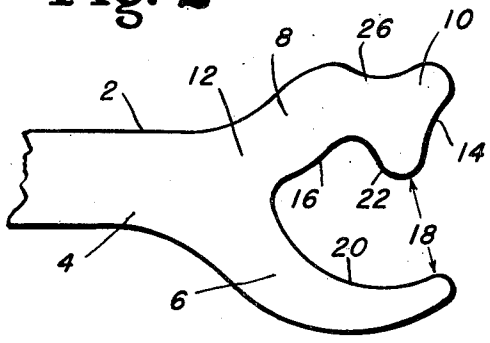



Fig. 3

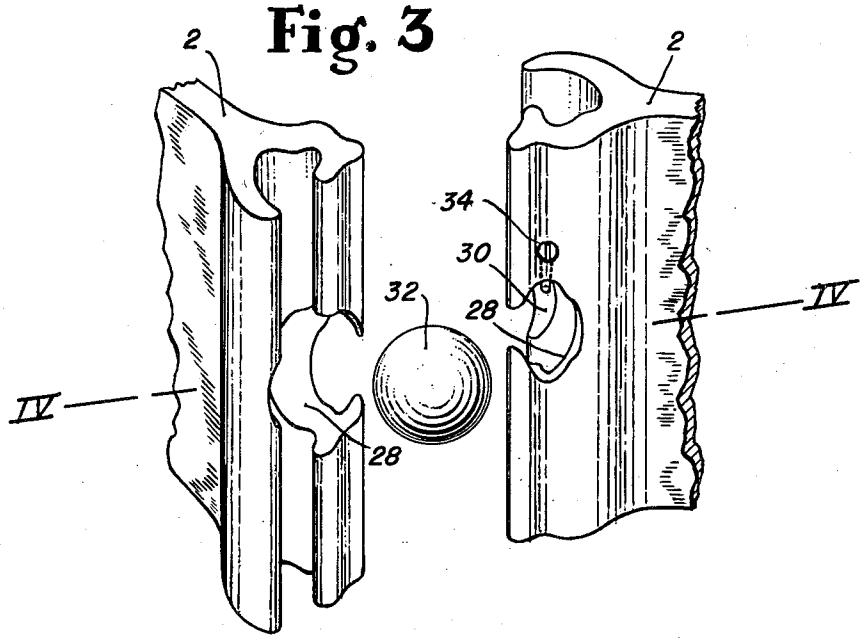
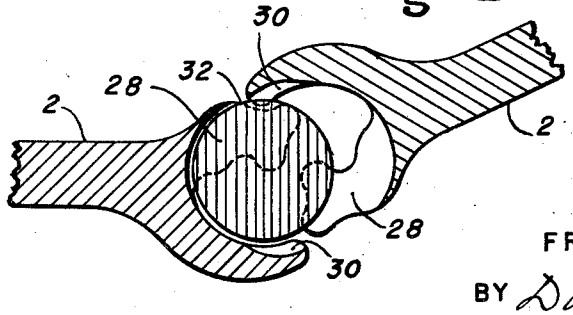



Fig. 4




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Fig. 5

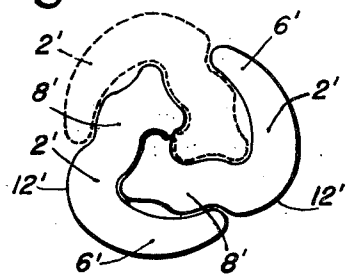



Fig. 6

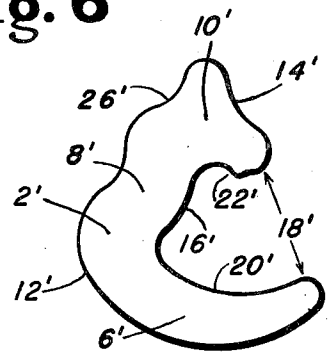



Fig. 7

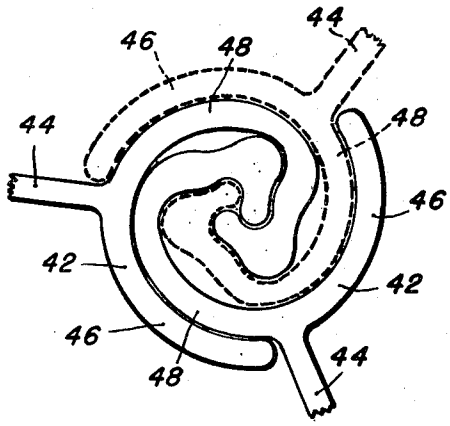



Fig. 8

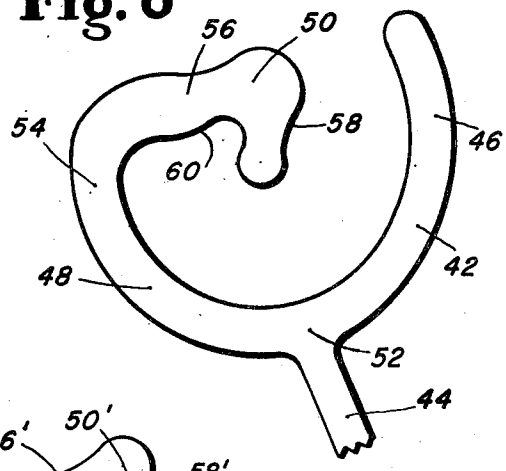
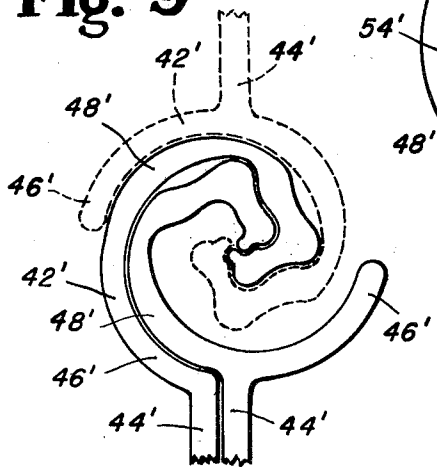



Fig. 9



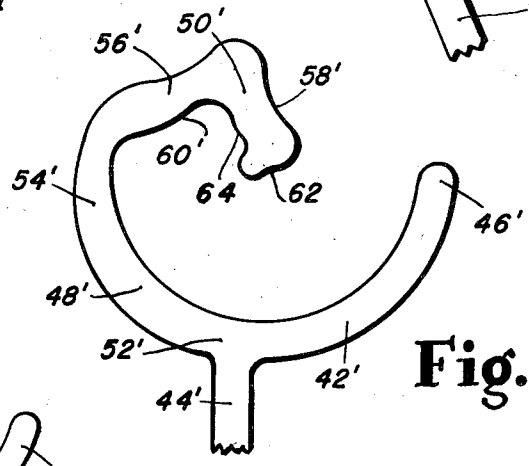




Fig. 10

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2,804,641

# HINGE JOINT

Frank J. Zavada, Pittsburgh, Pa.

Application July 22, 1955, Serial No. 523,869

6 Claims. (Cl. 16—178)

This invention relates to a hinge joint for connecting two members and more particularly for a hinge for supporting a door. Many different types of joints have been developed but most of them are difficult to fabricate and assemble and in most cases the parts are not interchangeable.

It is therefore an object of my invention to provide a hinge joint in which the parts are easily formed by extrusion.

Another object is to provide a hinge joint in which the two main parts thereof are easily assembled.

Still another object is to provide a hinge joint in which the two main parts are similar and interchangeable.

These and other objects will be more apparent after referring to the following specification and attached drawings, drawn to scale in which:

Figure 1 is a top plan view of an assembled hinge joint of my invention;

Figure 2 is an enlarged top view of one of the hinge members shown in Figure 1;

Figure 3 is a perspective view of the hinge joint of Figure 1 showing the parts ready for assembly;

Figure 4 is a sectional view taken on the line IV—IV of Figure 3, but showing the parts in a different phase of their assembly;

Figure 5 is a view, similar to Figure 1, showing a modification thereof;

Figure 6 is an enlarged top view of one of the hinge members shown in Figure 5;

Figure 7 is a view, similar to Figure 1, showing a further modification;

Figure 8 is an enlarged top view of one of the hinge members of Figure 7;

Figure 9 is a view, similar to Figure 7, showing a modification thereof; and

Figure 10 is an enlarged top view of one of the hinge members of Figure 9.

Referring more particularly to Figures 1 to 4 of the drawings the reference numeral 2 indicates the two hinge members making up a hinge joint. The hinge joint may be part of any structural member such as a door, window, panel, wall, endless conveyor, etc. Each hinge member 2 includes a web 4, an arcuate leg 6 and a second leg 8. The second leg 8 has a generally triangular portion 10 at its outer end which is connected to the web 4 by means of an intermediate portion 12. The outer end or side 14 of the triangular portion 10 is concave. The side 16 of the intermediate portion 12 facing the leg 6 is convex and shaped to receive the outer end 14. The distance 18 between legs 6 and 8 is sufficient to receive the triangularly shaped outer portion 10 of the other hinge member. The inner face 20 of leg 6 is essentially circular with its axis through point 22. The members 2 may be extruded or otherwise formed and then assembled either by moving them transversely or axially together. In many instances it is desirable to assemble the members by moving them transversely and the construction shown is desirable for this purpose. The members 2 are movable from the full



line position shown in Figure 1 through an angle of approximately 60° to the broken line position. In order to prevent the members 2 from separating a screw 24 may be screwed into side 26 of triangular portion 10 of one of the members 2.

When the hinge joint is used in a vertical position it is desirable to provide means for preventing longitudinal movement between the members 2. One such means is shown in Figures 3 and 4. As shown, a generally spherically shaped opening 28 is formed in each of the members 2 in the leg 8 and a second smaller generally spherically shaped opening 30 is formed in the leg 6. When the two members 2 are assembled the openings 28 and 30 form a pocket having a radius slightly greater than the radius of ball 32 which is received therein. In assembly the ball 32 is set in the hole 28 of one of the members 2 and the other member 2 is moved transversely into assembly therewith as described above. A screw 34 may then be threaded at an angle into one of the legs 8 until its end abuts against the ball 32 for preventing separation of the members 2. Other means such as a simple flange extending from one member 2 under the other member 2 may be used to prevent relative longitudinal movement betwen members 2.

By changing the dimensions of the members 2 the amount of rotation theerof may be varied. Figures 5 and 6 show an arrangement where the members 2' may rotate through an angle of 120°. In these figures the webs are omitted and the parts are indicated by priming the numbers indicating the corresponding parts in Figures 1 and 2.

In the embodiment of my invention shown in Figures 7 and 8, two similar hinge members 42 are assembled in a longitudinal direction to form a hinged joint. Each hinge member includes a web 44, an arcuate leg 46 and a second leg 48. The second leg 48 has a generally triangular portion 50 at its outer end which is connected to the web 44 by means of an intermediate portion 52 which is made up of an arcuate portion 54 of the same general shape as leg 46 and a generally radial portion 56. The outer end or side 58 of the triangular portion 50 is concave. The side 60 of the portion 56 facing leg 46 is convex and shaped to receive the outer end 58. The members 42 are of such shape as to be readily extrudable. It will be seen that the members 42 cannot be separated transversely and when required means similar to that used in my first embodiment may be used to prevent relative longitudinal movement therebetween. The members 42 are movable from the solid line portion shown in Figure 7 through an angle of approximately 120° to the broken line portion.

By changing the diameter of the members 42 the amount of rotation thereof may be varied. Figures 9 and 10 show an arrangement where the members 42' may rotate through an angle of approximately 180°. In these figures the parts are indicated by priming the numbers indicating the corresponding parts in Figures 7 and 8. The members 42' also differ from the members 42 in several additional respects. The web 44' of one of the members 42' is located at the end of the arcuate leg 46' in order to form a hinge which will permit movement of a door through an angle of 180°. It will be understood that in some instances the web 44' may be omitted entirely. The generally triangular portion 50' is provided with a slight depression 62 which is adapted to receive a corresponding projection 64 located on the triangular portion 50' in operating relationship thereto. The portions 62 and 64 are provided to aid in preventing separation of the parts.

While one embodiment of my invention has been shown and described, it will be apparent that other adaptations

and modifications may be made without departing from the scope of the following claims.

I claim:

1. A hinge joint comprising two similar and interchangeable members, each of said members including an arcuate leg, a second leg spaced from said arcuate leg, and means connecting said legs at their inner ends, said legs being spaced apart at their outer ends with the second leg of each member being received between the legs of the other member, each of said second legs having a generally triangularly shaped outer portion.

2. A hinge joint according to claim 1 in which the said second leg has an intermediate portion between the connecting means and the triangularly shaped outer portion, the side of said intermediate portion facing the first leg being shaped to receive the outer end of said triangular portion of the second leg of the other member, and the said outer end of said triangular portion being concave.

3. A hinge joint according to claim 2 in which the distance between the legs of each member at their outer ends is sufficient to receive the triangularly shaped outer portion therebetween.

4. A hinge joint according to claim 3 including means for preventing transverse separation of said members and means for preventing relative longitudinal movement of said members.



5. A hinge joint according to claim 2 in which the intermediate portion of said second leg includes an arcuate portion shaped generally like the first leg with the first leg bearing thereagainst and a generally radial portion extending between the arcuate portion and the triangularly shaped outer portion.

6. A hinge joint according to claim 5 including means for preventing relative longitudinal movement of said members.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 2,136,729 | Stahl | Nov. 15, 1938 |
| 2,199,102 | Hough | Apr. 30, 1940 |
| 2,641,018 | Snyder | June 9, 1953 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 524,228 | Great Britain | Aug. 1, 1940 |
| 588,493 | Germany | Nov. 23, 1933 |