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F2V  
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(54) Butterfly valve

(57) A butterfly valve comprises a planar flap (10) rotatable in a frame (12) about the axis (14) shown by a chain line through 90° to control a flow of fluid through the frame. The central plane of the flap is off-set from said axis by about 20°. The frame has opposed upstanding flanges (20) engaging edge surfaces of the flap when closed. The flap is supported by axles fixed in non-aligned apertures (22, 24).

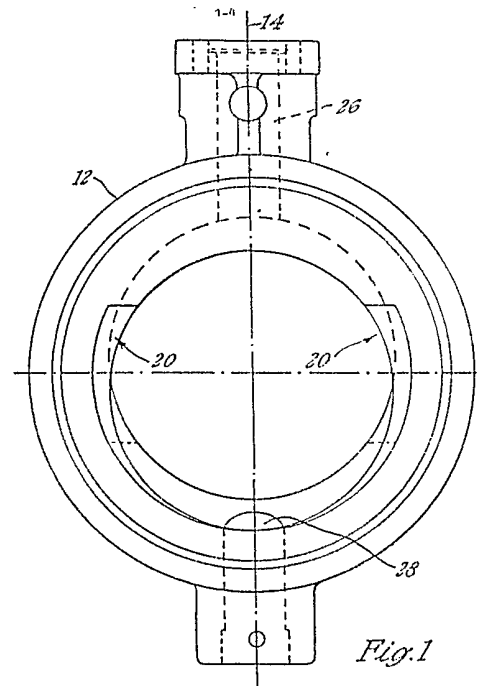
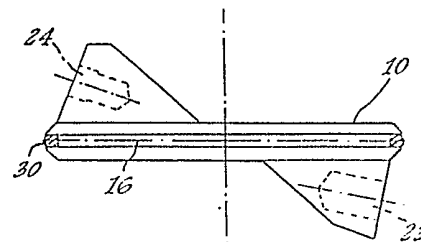
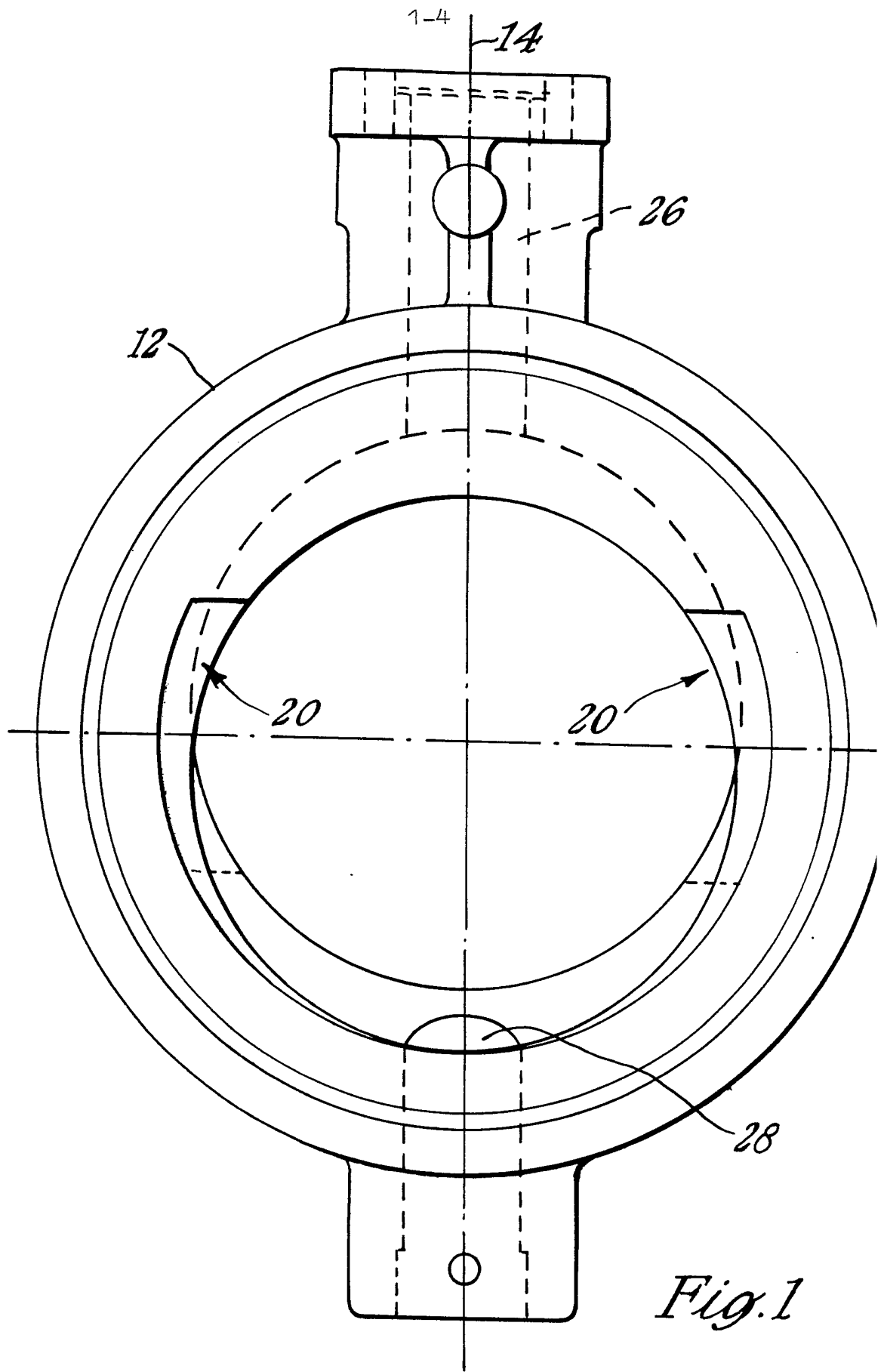
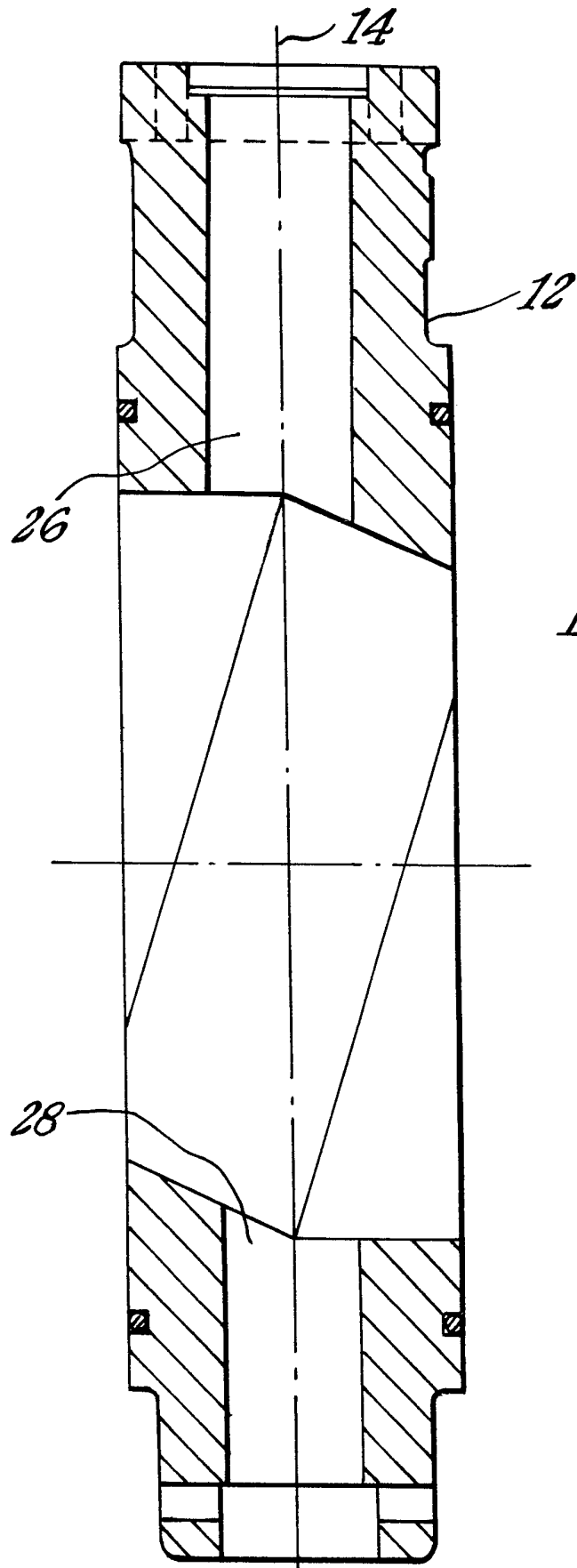


Fig. 3.



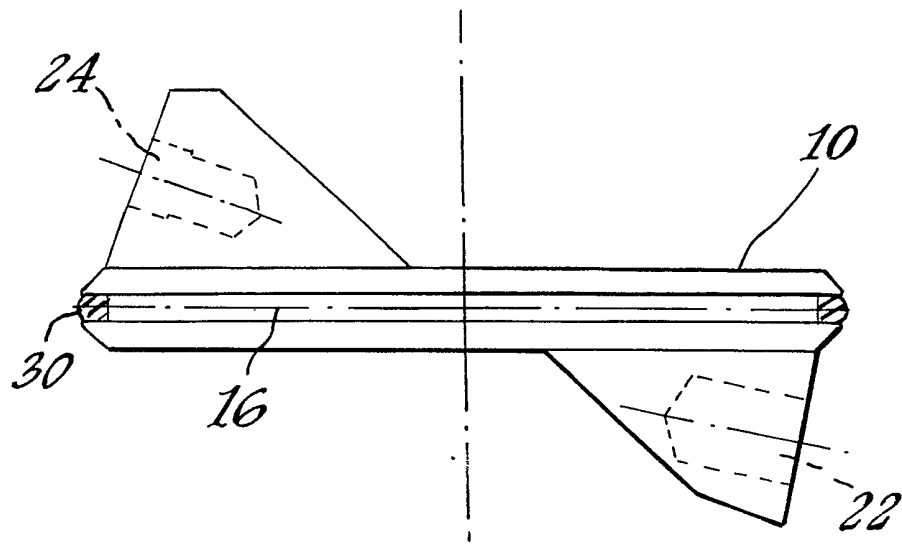


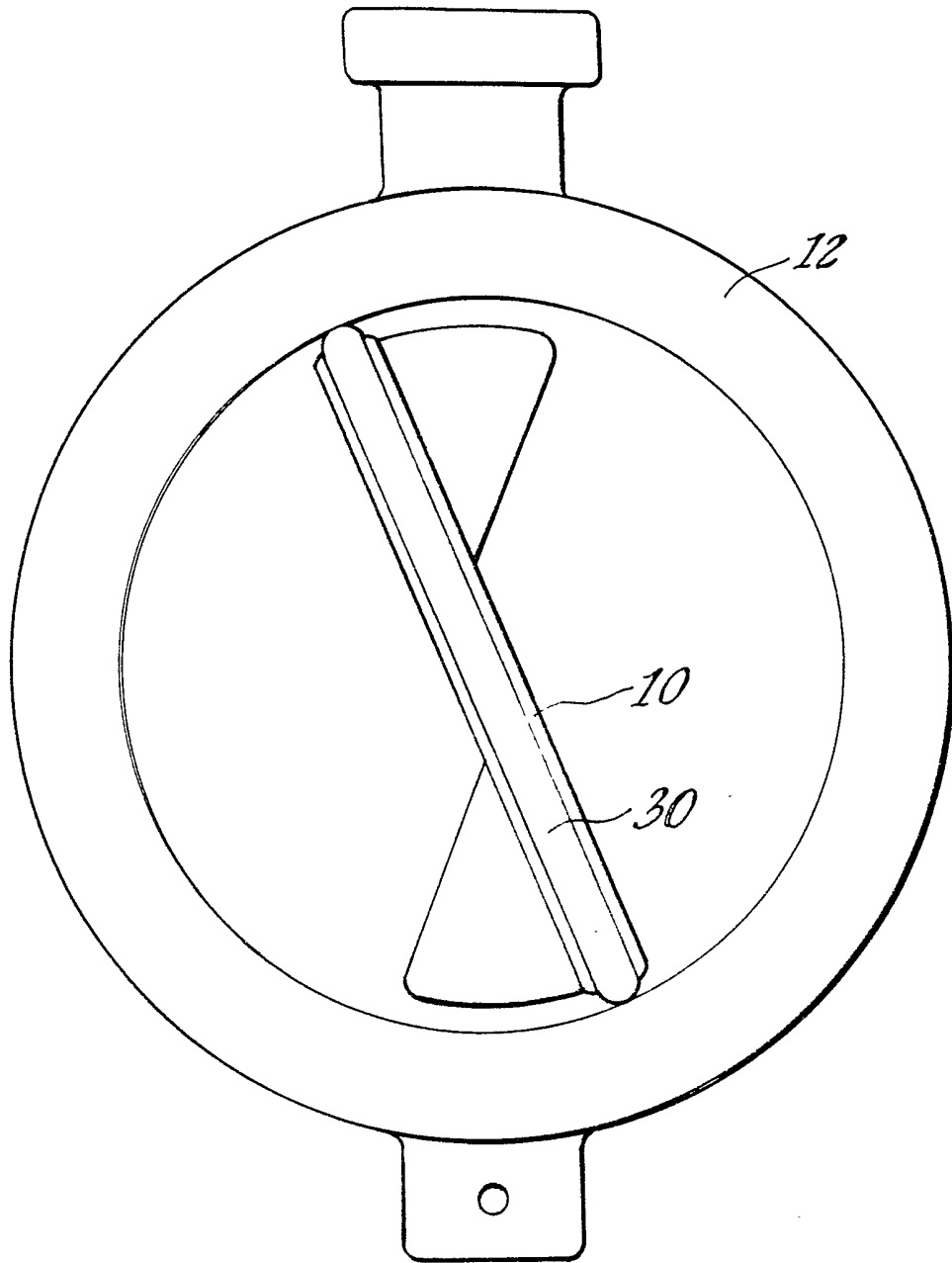
*Fig. 1*



*Fig. 2.*

*Fig. 3.*





*Fig. 4.*

## SPECIFICATION

**Butterfly valve**

5 This invention relates to butterfly valves.

Butterfly valves are well known for use in controlling through-flow of fluids and usually comprise a circular planar disc which is supported in a fluid passage to be rotated about central axis in the plane of the circular flap. In one position the flap fully closes off the passage and when rotated 90° from that position the flap offers a minimum obstruction to the flow of fluid. At intermediate positions the flap offers more of an obstruction and hence can reduce the rate of flow of fluid as compared to the fully open position.

According to the invention there is provided a butterfly valve comprising a planar flap supported in a frame to rotate about an axis extending across the frame and control a flow of fluid through the frame in which the central plane of the flap is off-set from the said axis by a few degrees.

The central plane may be off-set by 4° to 30°, and preferably at about 20°.

25 The inside of the frame and the flap are usually circular in cross-section.

The inside of the frame may have opposing upstanding flanges which bear against respective edge surfaces of the flap when the flap is in a closed position and allow the flap to rotate in only one direction from the closed position.

30 A seal may be mounted around the periphery of the flap. The seal may comprise material moulded onto the periphery of the flap or into a groove in the periphery of the flap where provided.

A butterfly valve according to the invention will now be described by way of example with reference to the accompanying drawings, in which:-

40 *Figure 1* shows a front elevation of a frame for the valve;

*Figure 2* shows a sectional side view of the frame;

*Figure 3* shows an isometric view of a flap for the valve; and

45 *Figure 4* shows a schematic view of an assembled valve.

Referring to the drawing, the butterfly valve has a planar flap 10 arranged to be mounted in a frame 12 and to rotate about a transverse axis 14. The central plane 16 of the flap 10 is at about 20° to the axis 14 when the flap is fitted in the frame 12. It will be noted in *Figure 1* that the inside cross-section of the frame 12 is shaped to provide opposing upstanding flanges 20 which engage against the respective edge surfaces of the flap 10 when the valve is closed and also prevent over-rotation of the flap 10 beyond 90° from a fully closed position.

The flap 10 is supported by axles (not shown) fixed in the apertures 22 and 24 (*Figure 3*) which rotate in the holes 26 and 28 (*Figure 2*). It will be seen in *Figure 3* that the axles will not be exactly aligned with one another and this tends to produce the effect of assisting the flap to "kick in" when close to its open or its closed position.

The periphery of the flap is fitted with a Viton (trade mark) rubber sealing ring 30 which is bonded

to the flap and fits into a peripheral groove formed in the flap 10. The sealing ring could be formed of other materials such as plastics material or compositions and, where rubber, can be moulded in and vulcanised onto the groove in the periphery of the flap 10.

70 The flap 10 is normally rotated by having one of the axles extending through the frame 12 and by fitting with a lever on the protruding part of the axle. The movement of the lever or rotation of the flap 10 may be controlled so as to be securable in a number of intermediate chosen positions as well as at the fully closed and the fully open positions.

The frame 14 is preferably made of metal and usually of cast iron, aluminium or stainless steel.

80 Whereas the axle 14 is transverse to the frame and hence to the flow of fluid in use through the frame, it will be appreciated the axis 14 may be at an angle, that is, not exactly transverse to the frame where preferred.

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## CLAIMS

1. A butterfly valve comprising a planar flap supported in a frame to rotate about an axis extending across the frame and control a flow of fluid through the frame in which the central plane of the flap is off-set from the said axis by a few degrees.

90 2. A butterfly valve according to Claim 1, in which the central plane is off-set by 4° to 30°.

95 3. A butterfly valve according to Claim 1 or 2, in which the central plane is off-set by approximately 20°.

4. A butterfly valve according to any one of Claims 1 to 3, in which the inside of the frame and the flap are circular in cross-section.

100 5. A butterfly valve according to any one of claims 1 to 4, in which the inside of the frame has opposing upstanding flanges which bear against respective edge surfaces of the flap when the flap is in a closed position and allow the flap to rotate in only one direction from the closed position.

105 6. A butterfly valve according to any one of claims 1 to 5, including a seal mounted around the periphery of the flap.

110 7. A butterfly valve according to Claim 6, in which the seal comprises material moulded onto the periphery of the flap.

8. A butterfly valve according to Claim 6, in which the seal comprises material moulded into a groove extending around the periphery of the flap.

115 9. A butterfly valve substantially as herein described with reference to *Figures 1 to 4* of the accompanying drawings.