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(12) **United States Design Patent** (10) **Patent No.:** **US D801,479 S**  
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(54) **ELECTROMAGNETIC VALVE**

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(30) **Foreign Application Priority Data**

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(51) **LOC (10) Cl.** ..... **23-01**

(52) **U.S. Cl.**  
USPC ..... **D23/233**

(58) **Field of Classification Search**  
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251/129.15, 129.01, 129.09; 137/487.5,  
137/13, 599.07

(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D563,510 S \* 3/2008 Yoshimura ..... D23/233  
D563,511 S \* 3/2008 Mita ..... D23/233  
(Continued)

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Toshiyuki Yokoi

(57) **CLAIM**

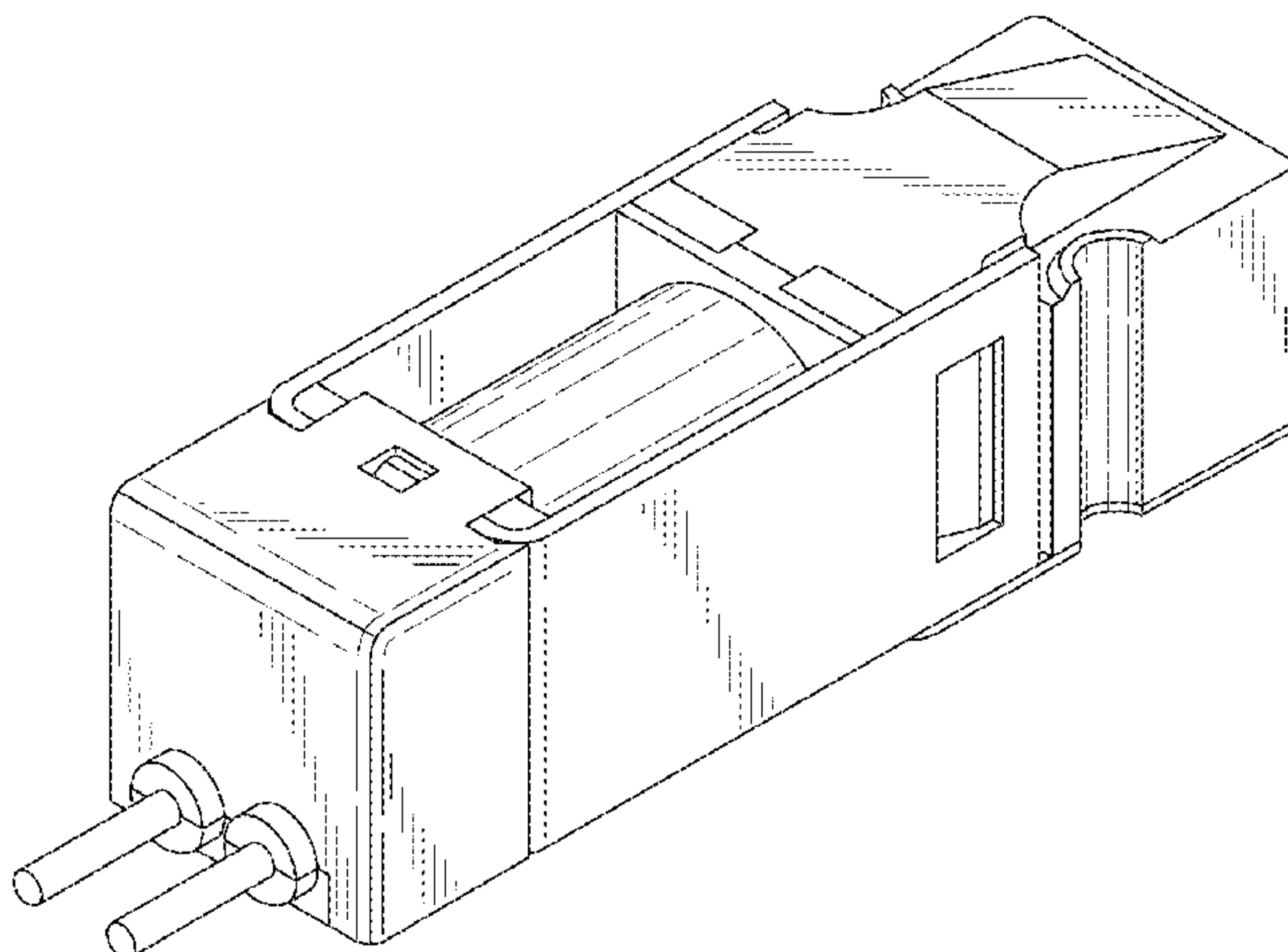
The ornamental design for an electromagnetic valve, as shown and described.

#### DESCRIPTION

FIG. 1 shows a front view of an electromagnetic valve showing our new design;  
FIG. 2 shows a rear view thereof;  
FIG. 3 shows a right side view thereof;  
FIG. 4 shows a left side view thereof;  
FIG. 5 shows a top view thereof;  
FIG. 6 shows a bottom view thereof;  
FIG. 7 shows a top, front and left side perspective view thereof; and,  
FIG. 8 shows a bottom, rear and right side perspective view thereof.

The present article is an electromagnetic valve used for switching communication and blockage of pressure fluid. The electromagnetic valve includes: a body; solenoid coil portion projected from one end side of the body; a U-shaped flame continuously formed on the one end side of the body to surround the solenoid coil portion; and a rectangular connector portion continuously formed on the one end side of the flame (See Reference drawings 1 and 2). On the bottom surface of the body, a gasket is provided and two pressure fluid inlet/outlet ports are formed along the longitudinal direction. Inside the body and the solenoid coil portion, a not illustrated valve body for switching communication and blockage between the two pressure fluid inlet/outlet ports; a not illustrated plunger (movable iron core) attached to a tip of the valve body; and a not illustrated solenoid coil are housed. Magnetic plates are provided on the top and bottom surfaces to apply electromagnetic force on the plunger. Not illustrated guide grooves having a semi-circular cross section are formed on the front and rear surfaces of the body to guide mounting screws. Lead wires are provided on the connector portion to feed electricity and receive control signals. When using, the present article is mounted on a desired position using not illustrated screws. Then, a pressure fluid supply source is connected to one of the pressure fluid inlet/outlet ports, and a fluid pressure device is connected to the other of the pressure fluid inlet/outlet ports to supply the pressure fluid to the fluid pressure

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device. When the electricity is supplied and shut off via the lead wires, the plunger moves in the longitudinal direction in the solenoid coil portion and the body by the electromagnetic force generated from the solenoid coil. By the movement of the plunger, the valve body is moved in the body. Thus, the communication and blockage between the two pressure fluid inlet/outlet ports are switched.

1 Claim, 8 Drawing Sheets

(58) **Field of Classification Search**  
CPC .. F16K 31/0675; F16K 27/029; F16K 27/048;  
F16K 31/082  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D563,512	S	*	3/2008	Mita	.....	D23/233
D563,513	S	*	3/2008	Mita	.....	D23/233
D564,072	S	*	3/2008	Yoshimura	.....	D23/233
D698,419	S	*	1/2014	Narita	.....	D23/233
D698,901	S	*	2/2014	Narita	.....	D23/233
D702,321	S	*	4/2014	Narita	.....	D23/233

\* cited by examiner

FIG. 1

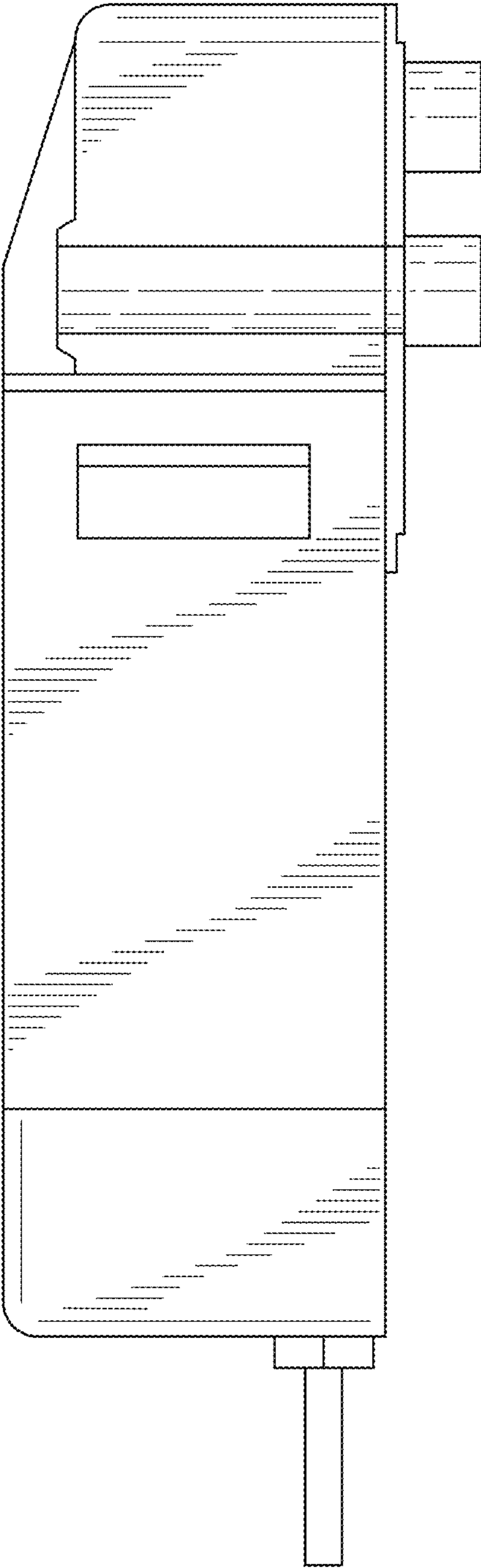


FIG. 2

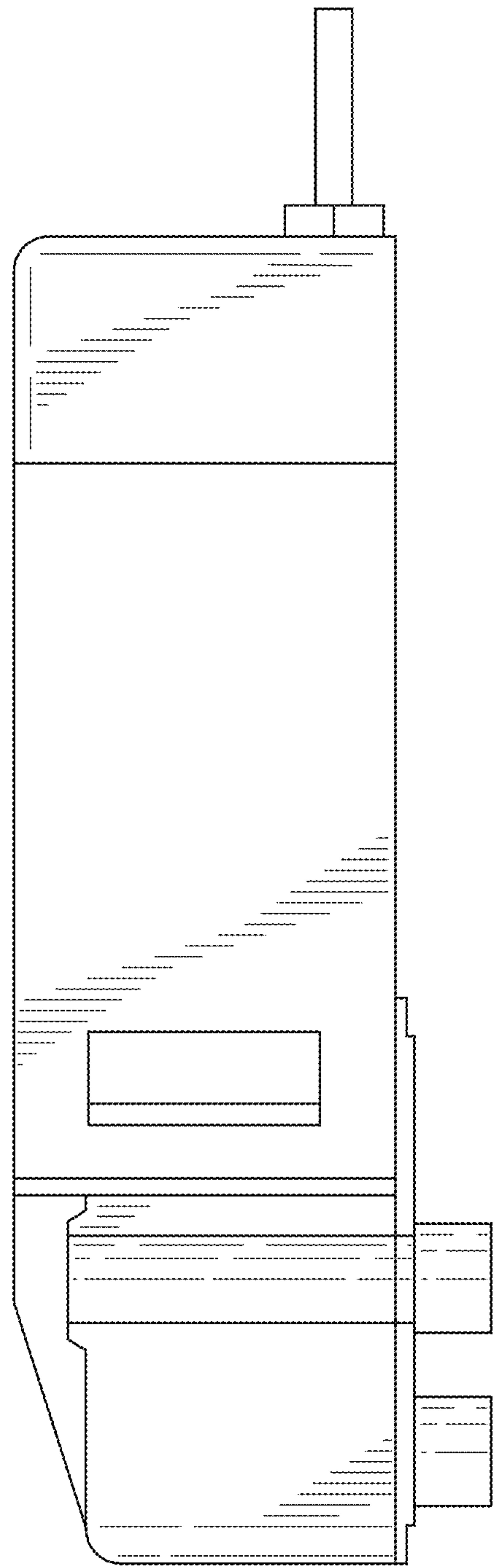


FIG. 3

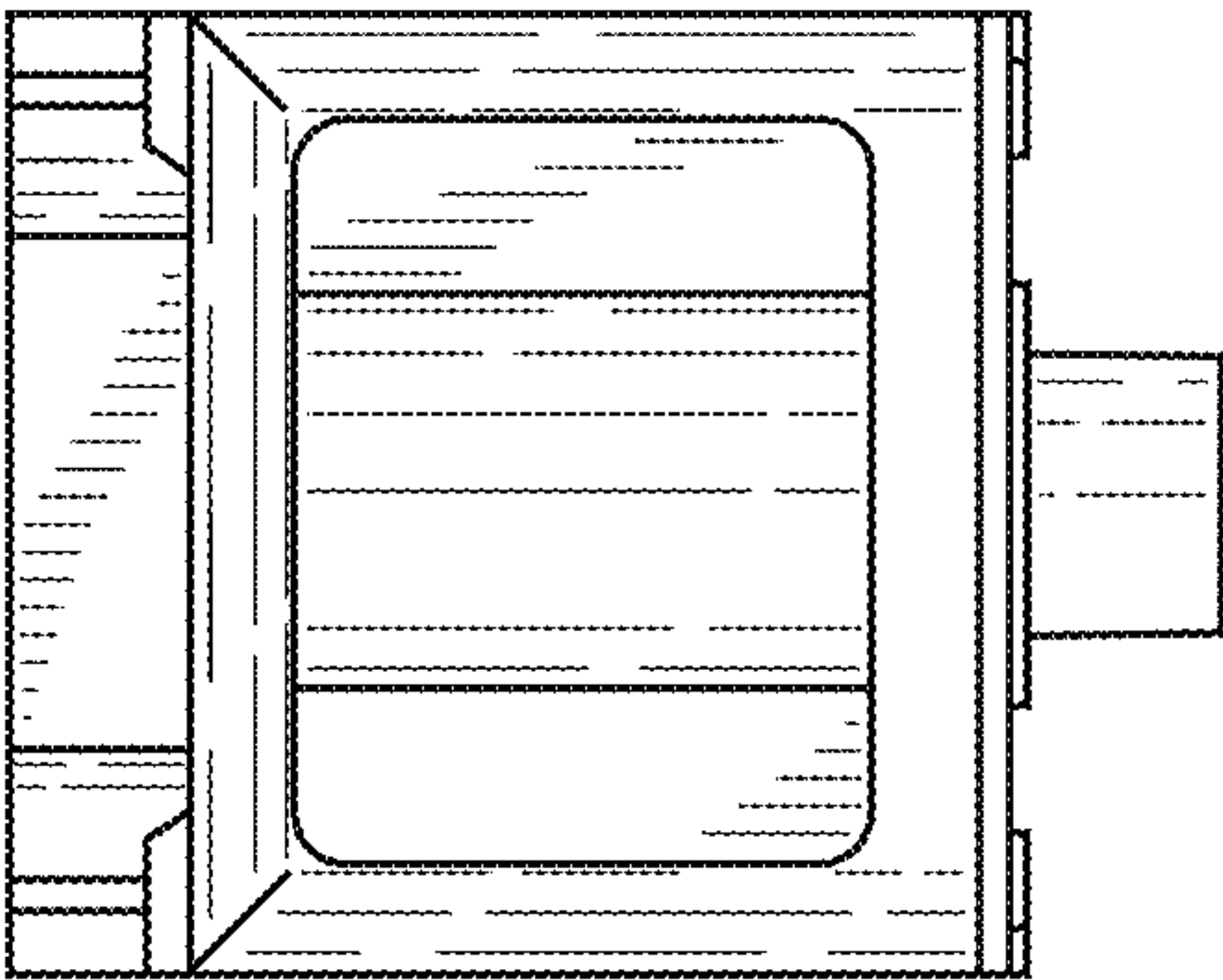


FIG. 4

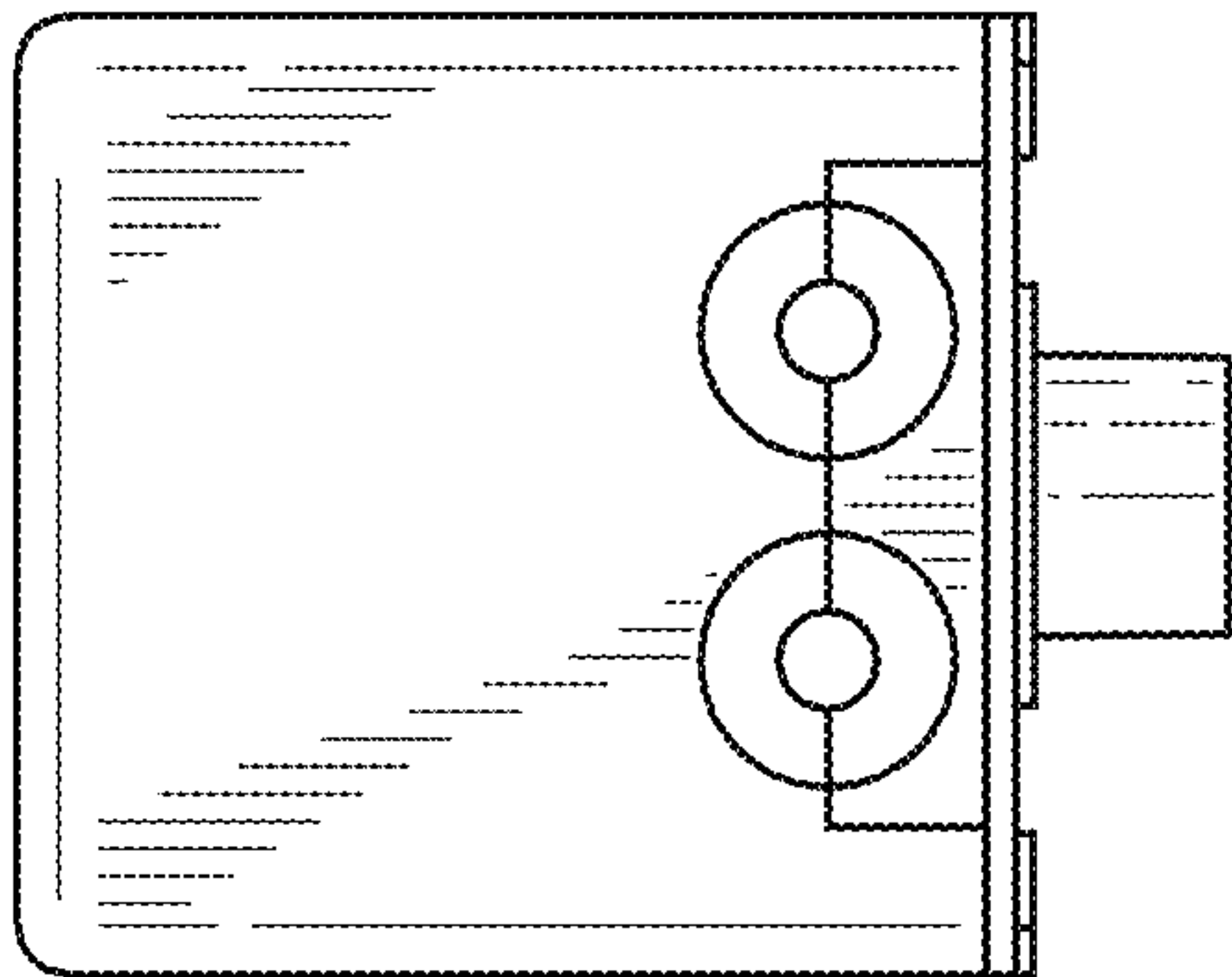


FIG. 5

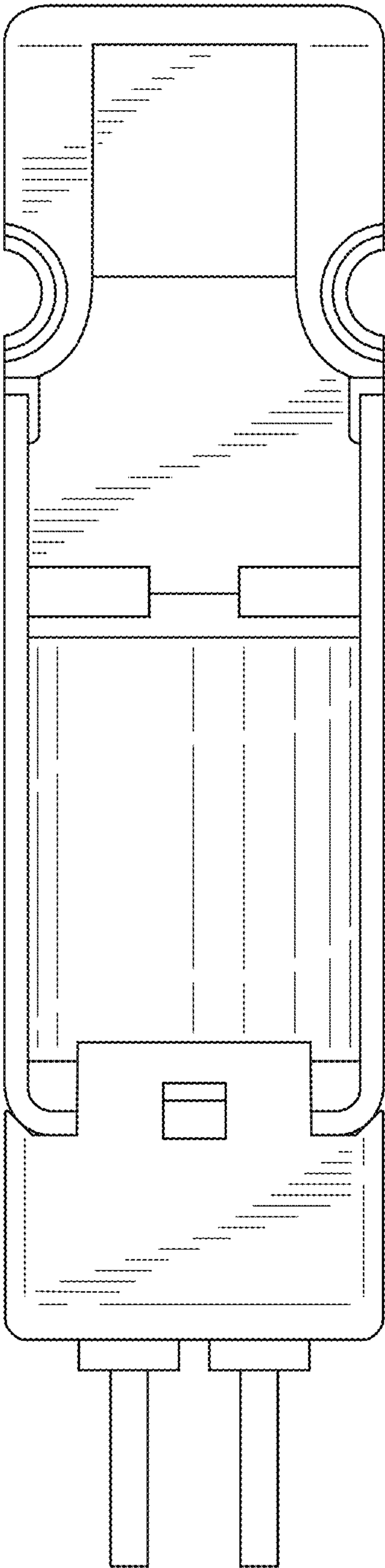




FIG. 6

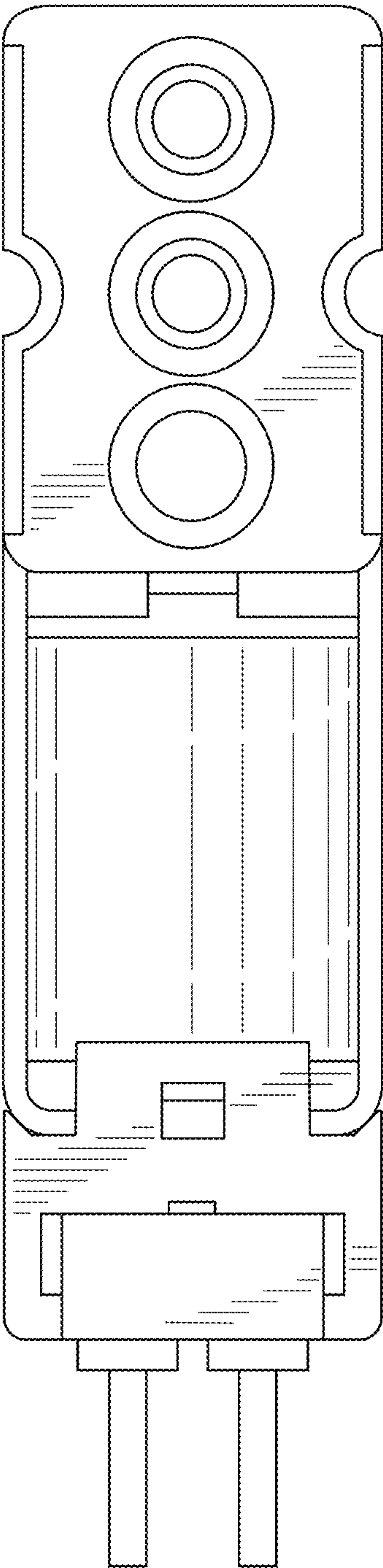




FIG. 7

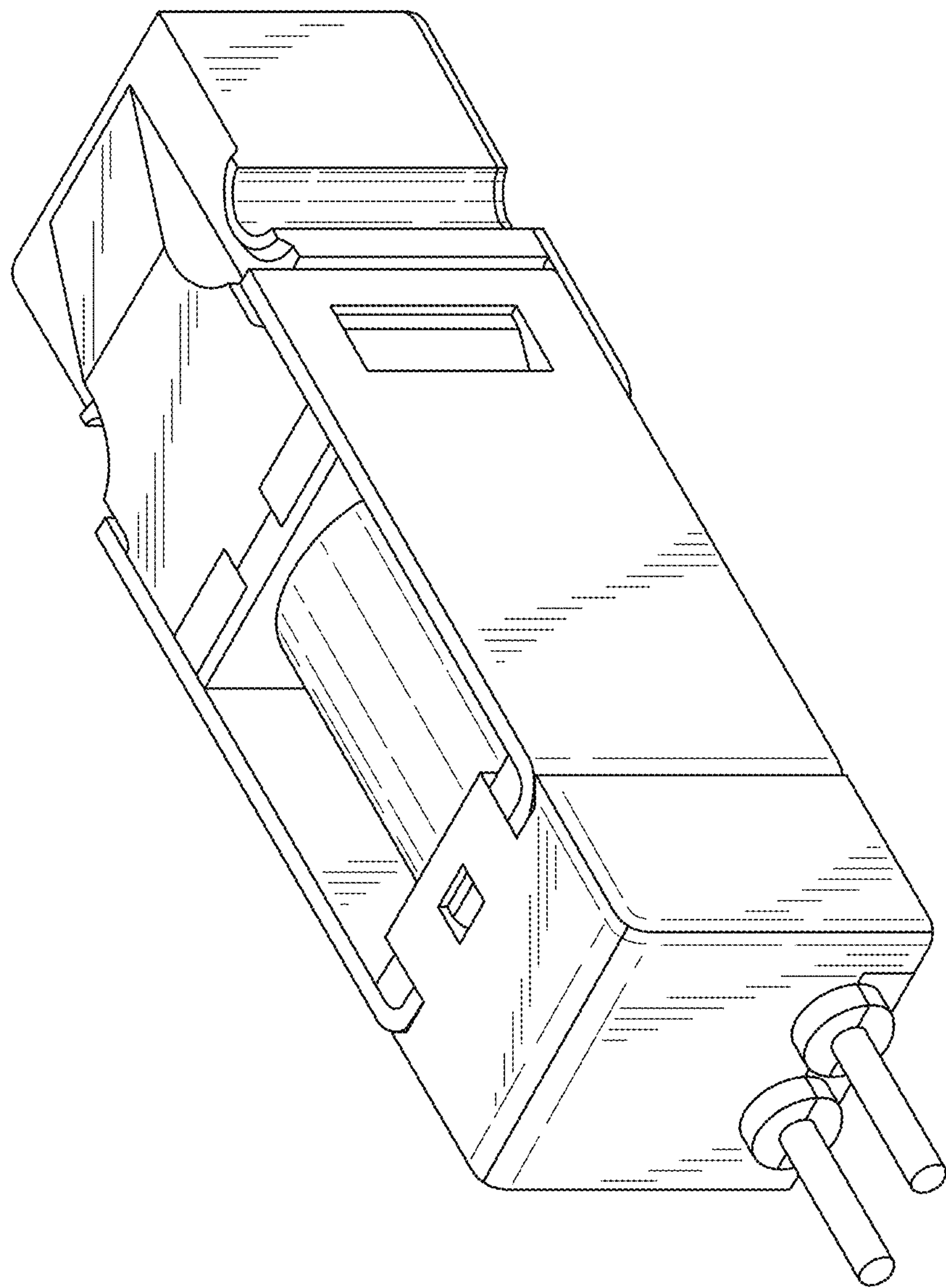


FIG. 8

