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(12) **United States Design Patent**
Kucharski

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(54) **GEARBOX ASSEMBLY FOR AN AXLE**

6,964,317 B2 11/2005 Groves et al.
7,028,583 B2 4/2006 Bennett
7,115,058 B2 10/2006 Duncan

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(Continued)

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FOREIGN PATENT DOCUMENTS

CA 1 213 470 A 11/1986
CN 2541230 Y 3/2003

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(Continued)

(**) Term: **15 Years**

OTHER PUBLICATIONS

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(Continued)

(30) **Foreign Application Priority Data**

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(51) **LOC (11) Cl.** **12-16**

(57) **CLAIM**

(52) **U.S. Cl.**

An ornamental design for a gearbox assembly for an axle, as shown and described.

USPC **D12/160**

(58) **Field of Classification Search**

DESCRIPTION

USPC D12/159-160

CPC B60G 2200/10; B60G 2200/143; B60G

FIG. 1 is a front perspective view of a gearbox assembly for an axle;

FIG. 2 is a top plan view of the gearbox of FIG. 1;

FIG. 3 is a bottom plan view of the gearbox of FIG. 1;

FIG. 4 is a front elevational view of the gearbox of FIG. 1;

FIG. 5 is a rear elevational view of the gearbox of FIG. 1;

FIG. 6 is a right side elevational view of the gearbox of FIG. 1; and,

FIG. 7 is a left side elevational view of the gearbox of FIG. 1.

The broken lines, depicted as dot-dot-dot lines, are included for the purpose of illustrating the axle and/or portion(s) of the gearbox assembly that form no part of the claimed design.

2200/156; B60G 2200/20; B60G 2200/21;

B60G 2200/341; B60G 2204/1242; B60G

2300/026; F16H 57/0483; F16H 1/46;

F16H 48/38; F16H 57/037; F16H

2057/02052; F16H 57/082

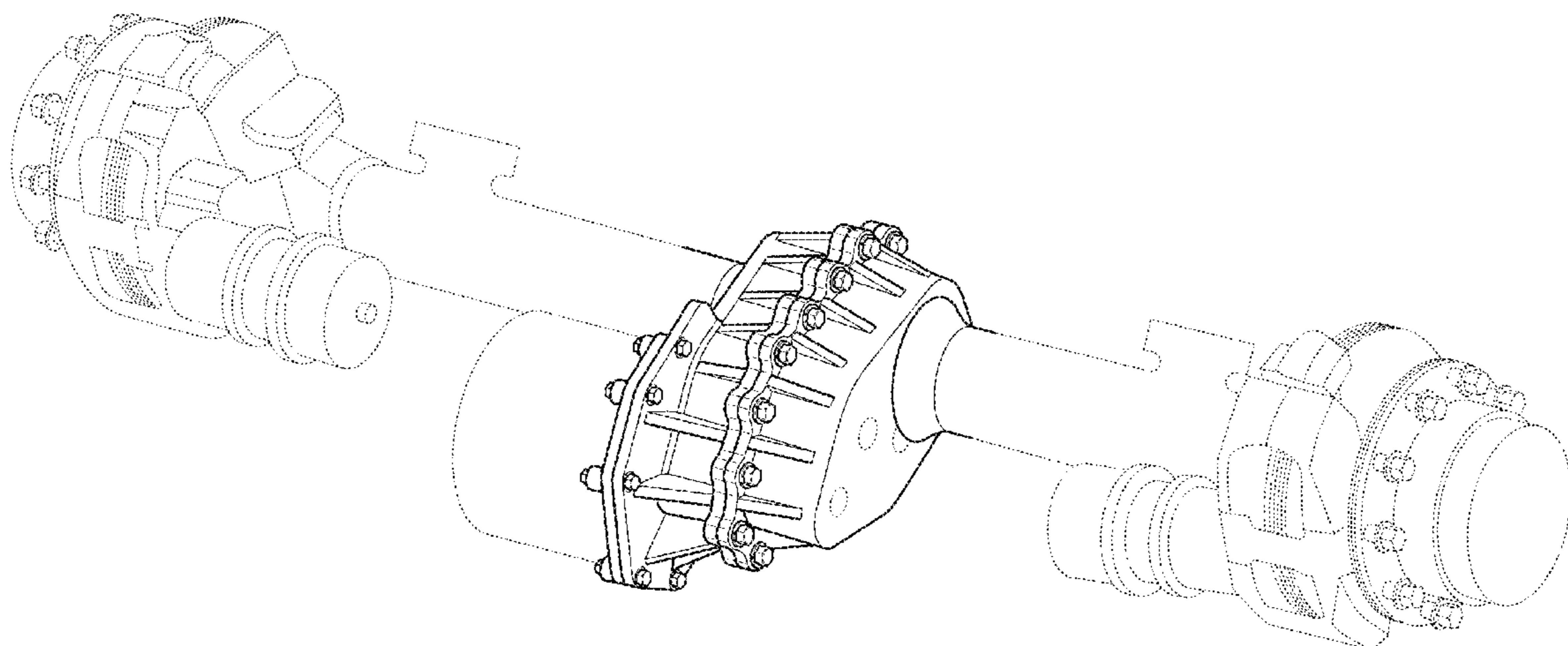
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,492,600 A 1/1985 Brunn et al.
5,352,164 A 10/1994 Bensinger et al.
6,276,474 B1 8/2001 Ruppert et al.
6,431,298 B1 8/2002 Ruppert, Jr. et al.
6,820,707 B1 11/2004 Cantemir

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

7,143,861 B2 * 12/2006 Chu B60G 3/20
180/346
7,297,083 B2 11/2007 Duncan
7,410,440 B2 * 8/2008 Garcia B60B 35/08
29/401.1
7,819,411 B2 * 10/2010 Eshelman B60G 3/20
280/124.135
7,959,170 B2 * 6/2011 Mauz B60G 3/20
280/124.109
8,118,133 B2 2/2012 Armfield
8,465,035 B2 * 6/2013 Gander B60B 35/04
280/124.1
8,517,140 B2 * 8/2013 West B60G 3/20
180/360
8,640,801 B2 2/2014 Hennings et al.
8,858,379 B2 10/2014 Keeney et al.
9,115,792 B2 * 8/2015 Skotty F16H 1/46
9,221,496 B2 * 12/2015 Barr B62D 21/11
9,267,596 B2 * 2/2016 Trost F16H 57/045
9,296,389 B2 3/2016 Bernhardt
9,400,034 B1 7/2016 Pritchard et al.
9,421,862 B2 * 8/2016 Wang F16H 57/037
9,429,222 B2 * 8/2016 Bassi B60K 17/36
9,517,658 B2 * 12/2016 Chung F16H 48/08
9,573,452 B2 2/2017 Agnew
9,719,584 B1 8/2017 Duan et al.
9,771,037 B2 9/2017 Kugelstadt et al.
2002/0104704 A1 8/2002 Chang
2003/0111280 A1 6/2003 Platner et al.
2005/0006164 A1 1/2005 Teraoka
2005/0023053 A1 2/2005 Bennett
2005/0023885 A1 2/2005 Bennett
2006/0094552 A1 5/2006 Duncan
2010/0276901 A1 * 11/2010 Richardson B60G 3/20
280/93.512
2011/0094807 A1 4/2011 Pruitt et al.
2012/0247855 A1 10/2012 Mimura et al.
2013/0240282 A1 9/2013 Bindl
2014/0095002 A1 4/2014 Crecelius et al.
2014/0295979 A1 10/2014 Knoblauch
2017/0219078 A1 8/2017 Wang et al.
2017/0261082 A1 9/2017 Pritchard et al.
2017/0320384 A1 11/2017 Kochidomari et al.

FOREIGN PATENT DOCUMENTS

CN 2600273 Y 1/2004
CN 200971047 Y 11/2007
CN 201312154 Y 9/2009
CN 202480779 U 10/2012
CN 103434390 A 12/2013
CN 103496320 A 1/2014
CN 203992104 U 12/2014
CN 104309429 A 1/2015
CN 204095429 U 1/2015
CN 205326780 U 6/2016
CN 205326801 U 6/2016
CN 205468492 U 8/2016
CN 205951712 U 2/2017
CN 205951969 U 2/2017
CN 103538474 B 9/2017
CN 105034789 B 9/2017
CN 105150862 B 9/2017
CN 107215393 A 9/2017
CN 104986032 B 10/2017
CN 107244234 A 10/2017
CN 107284214 A 10/2017
CN 107284224 A 10/2017
CN 206551871 U 10/2017
CN 105818861 B 11/2017
CN 107344488 A 11/2017
CN 206633786 U 11/2017
DE 102016203970 A1 9/2017
DE 112015004318 T5 10/2017

EP 0 070 455 A1 1/1983
EP 0 079 455 A1 5/1983
FR 3 003 813 A1 10/2014
GB 2548975 A 10/2017
JP 6209297 B1 10/2017
WO WO 88/04241 A1 6/1988
WO WO 2013/087527 A1 6/2013
WO 2017172614 A1 10/2017
WO 2017172722 A1 10/2017
WO 2017172788 A1 10/2017

OTHER PUBLICATIONS

English language abstract and computer-generated English language translation for CN 2541230Y extracted from espacenet.com database on May 24, 2017, 7 pages.
English language abstract and computer-generated English language translation for CN 2600273Y extracted from espacenet.com database on May 24, 2017, 4 pages.
English language abstract and computer-generated English language translation for CN 200971047Y extracted from espacenet.com database on May 24, 2017, 6 pages.
English language abstract and computer-generated English language translation for CN 103434390A extracted from espacenet.com database on May 24, 2017, 12 pages.
English language abstract and computer-generated English language translation for CN 103496320A extracted from espacenet.com database on May 24, 2017, 4 pages.
English language abstract and computer-generated English translation for CN 201312154Y extracted from Thomson Reuters database on Nov. 2, 2015, 6 pages.
English language abstract and computer-generated English translation for CN 202480779U extracted from Thomson Reuters database on Nov. 24, 2015, 5 pages.
English language abstract and computer-generated English translation for CN 203992104U extracted from Thomson Reuters database on Feb. 8, 2016, 6 pages.
English language abstract and computer-generated English translation for CN 204095429U extracted from espacenet.com database on Sep. 27, 2016, 9 pages.
English language abstract and computer-generated English translation for CN 104309429A extracted from espacenet.com database on Sep. 27, 2016, 8 pages.
English language abstract for EP 0 070 455A1 extracted from espacenet.com database on Sep. 27, 2016, 1 page.
English language abstract for FR 3 003 813A1 extracted from espacenet.com database on Sep. 28, 2016, 1 page.
English language abstract and computer-generated English translation for WO 88/04241A1 extracted from espacenet.com database on Sep. 28, 2016, 12 pages.
English language abstract and computer-generated English translation for WO 2013/087527A1 extracted from espacenet.com database on Sep. 28, 2016, 15 pages.
U.S. Appl. No. 62/268,852, filed Dec. 17, 2015, 13 pages.
U.S. Appl. No. 62/333,032, filed May 6, 2016, 17 pages.
Computer-generated English language translation for CN 205951712U extracted from LexisNexis database on Apr. 12, 2017, 6 pages.
English language abstract and computer-generated English language translation for CN 205326780U extracted from LexisNexis database on May 26, 2017, 20 pages.
English language abstract and computer-generated English language translation for CN 205326801U extracted from LexisNexis database on May 26, 2017, 22 pages.
English language abstract and computer-generated English language translation for CN 205468492U extracted from LexisNexis database on May 26, 2017, 23 pages.
English language abstract for EP 0 079 455 extracted from espacenet.com database on Sep. 18, 2017, 1 page.
English language abstract for CN 103538474B extracted from espacenet.com database on Dec. 13, 2017, 1 page.

(56)

References Cited

OTHER PUBLICATIONS

English language abstract and computer-generated English language translation for CN 105034789B extracted from espacenet.com database on Dec. 13, 2017, 9 pages.

English language abstract and computer-generated English language translation for CN CN105150862B extracted from espacenet.com database on Dec. 13, 2017, 22 pages.

Computer-Generated English language abstract for CN 107215393A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

English language abstract and machine-assisted English translation for CN104986032B extracted from espacenet.com database on Dec. 18, 2017, 9 pages.

Computer-Generated English language abstract and computer-generated English language translation for CN 107244234A extracted from espacenet.com database on Dec. 13, 2017, 14 pages.

Computer-Generated English language abstract for CN 206551871U extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

Computer-Generated English language abstract for CN 107284214A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

Computer-Generated English language abstract and for CN 107284224A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

English language abstract and computer-generated English language translation for CN 105818861B extracted from espacenet.com database on Dec. 13, 2017, 9 pages.

Computer-Generated English language abstract and computer-generated English language translation for CN 206633786U extracted from espacenet.com database on Dec. 13, 2017, 11 pages.

Computer-Generated English language abstract for CN 107344488A extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

Computer-Generated English language abstract and computer-generated English language translation for DE102016203970A1 extracted from espacenet.com database on Dec. 13, 2017, 10 pages.

English language abstract for DE112015004318T5 extracted from espacenet.com database on Dec. 13, 2017, 2 pages.

English language abstract for JP6209297B1 extracted from LexisNexis database on Dec. 13, 2017, 1 page.

* cited by examiner

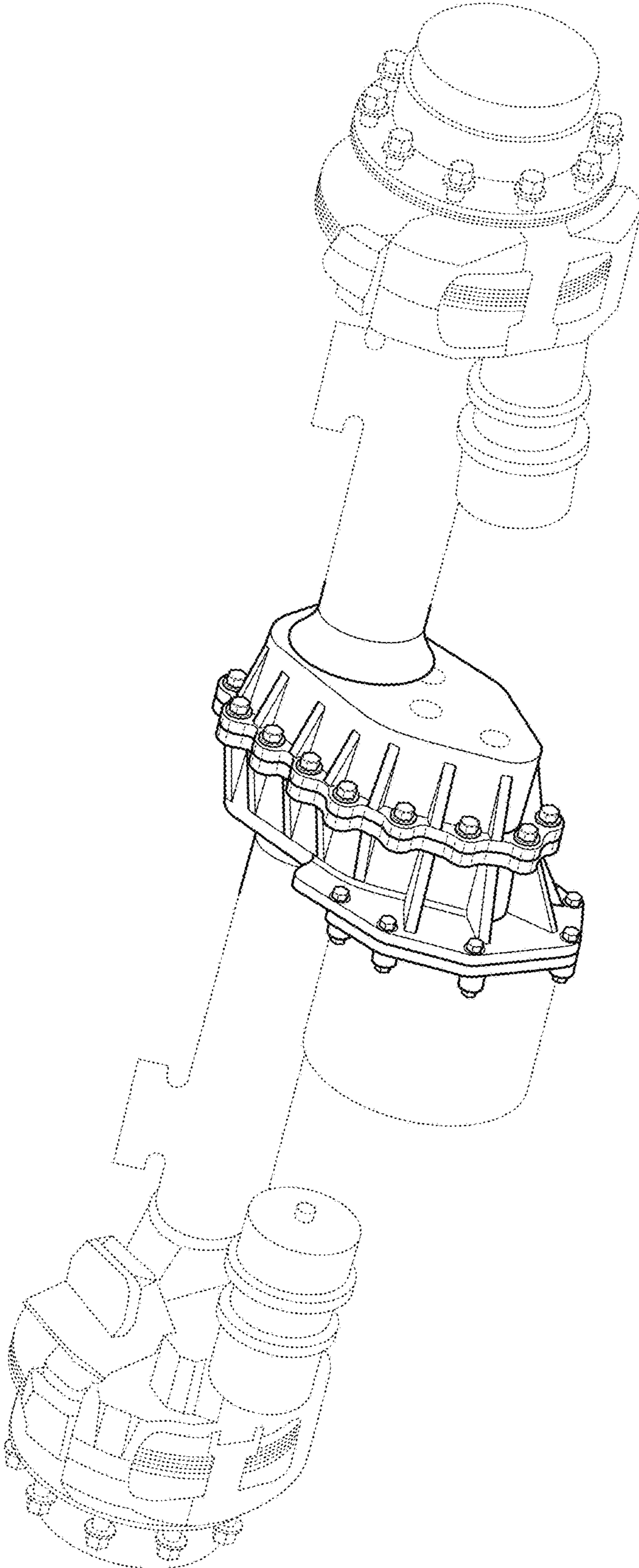


FIG. 1

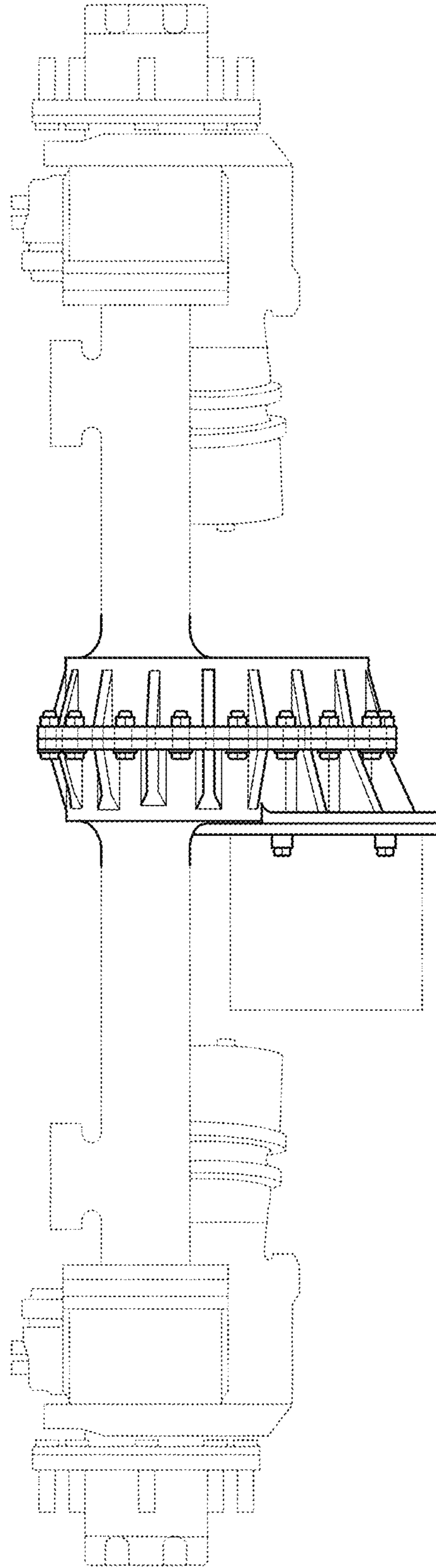


FIG. 2

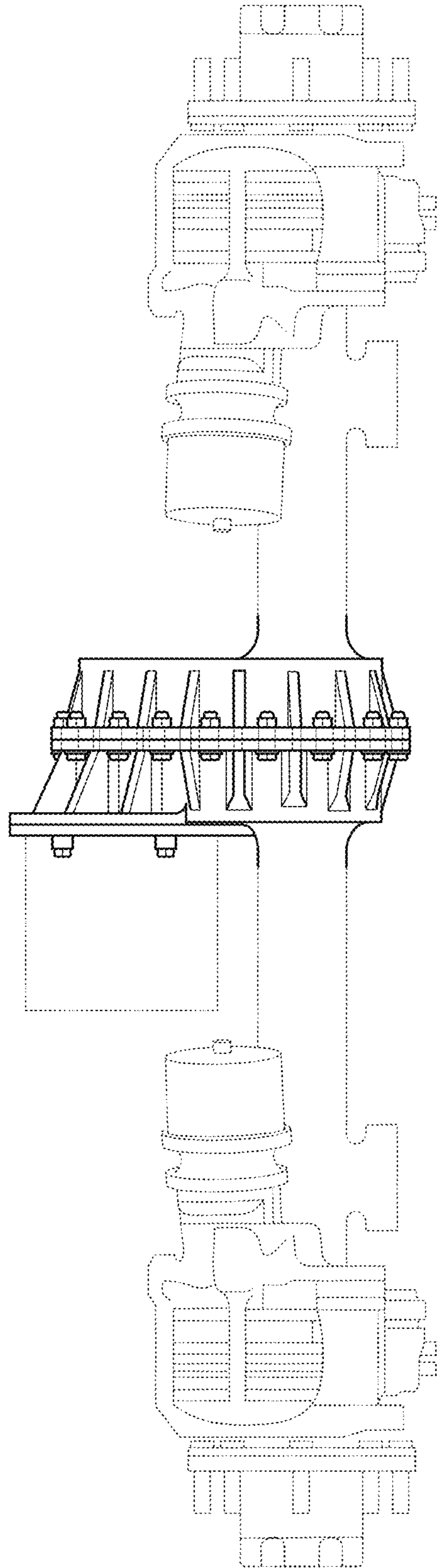


FIG. 3

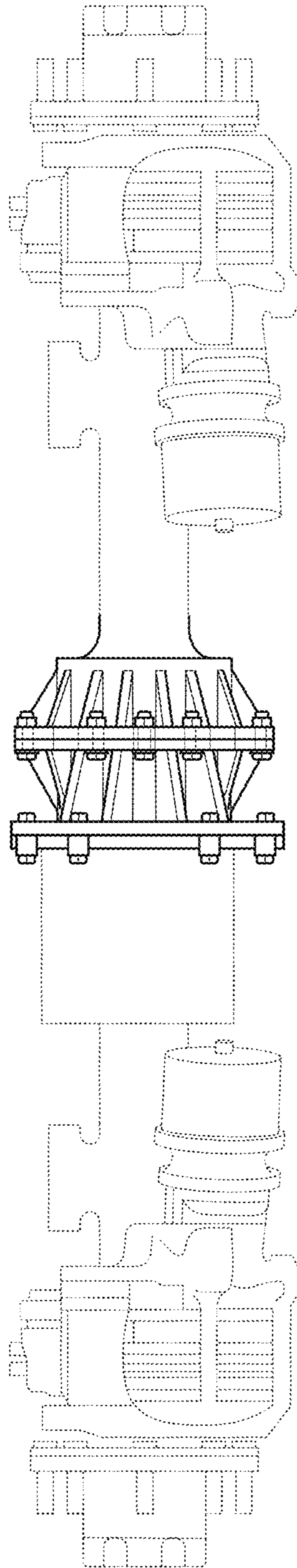


FIG. 4

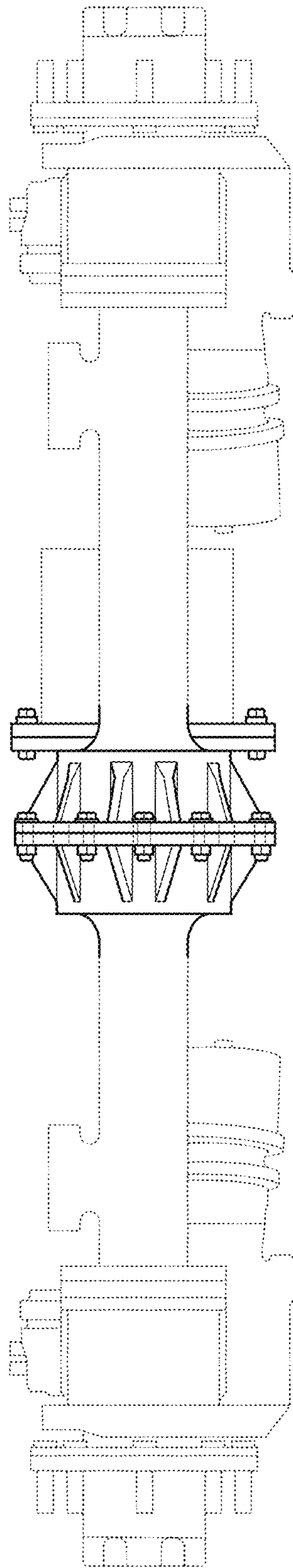


FIG. 5

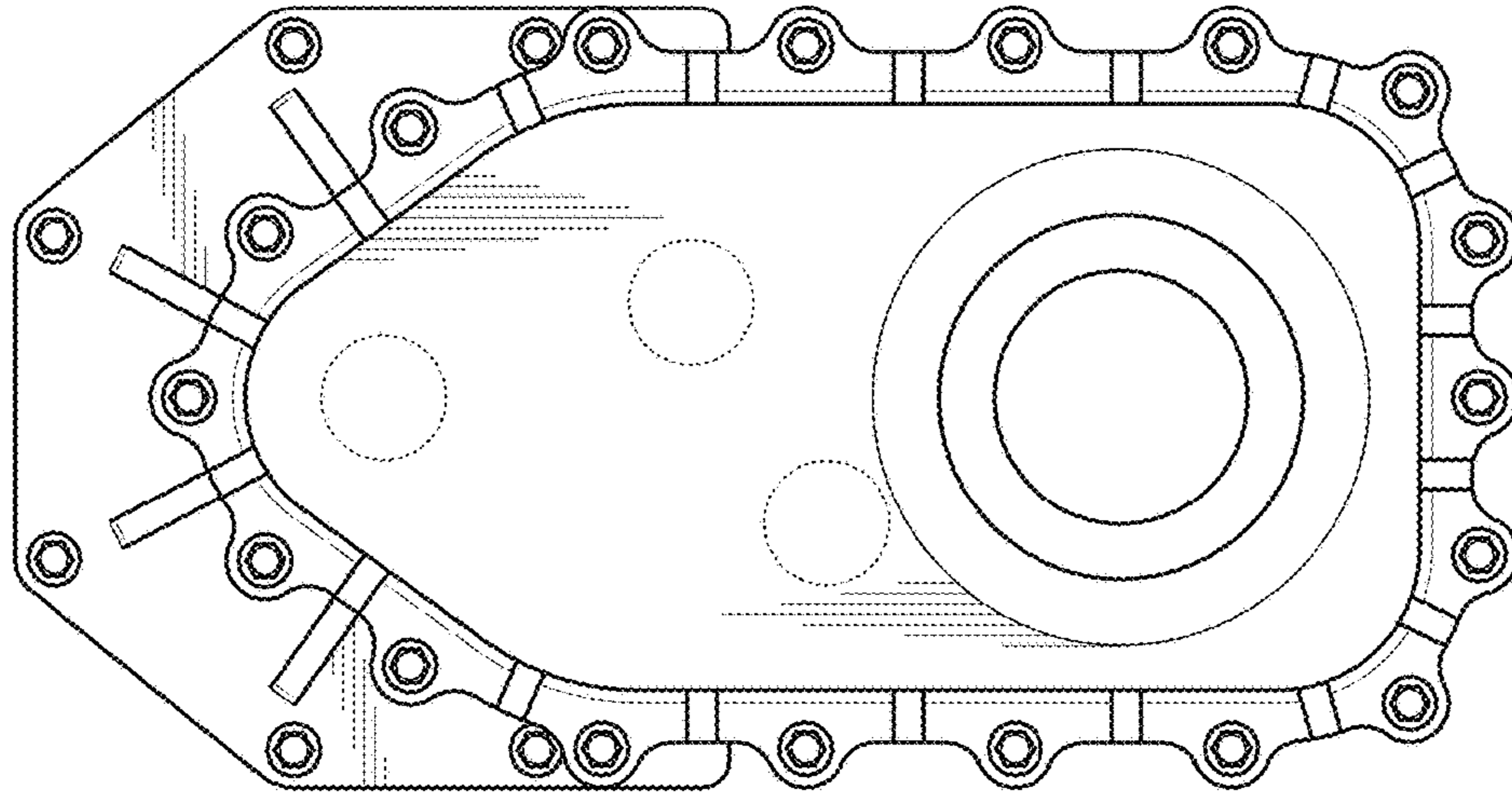


FIG. 6

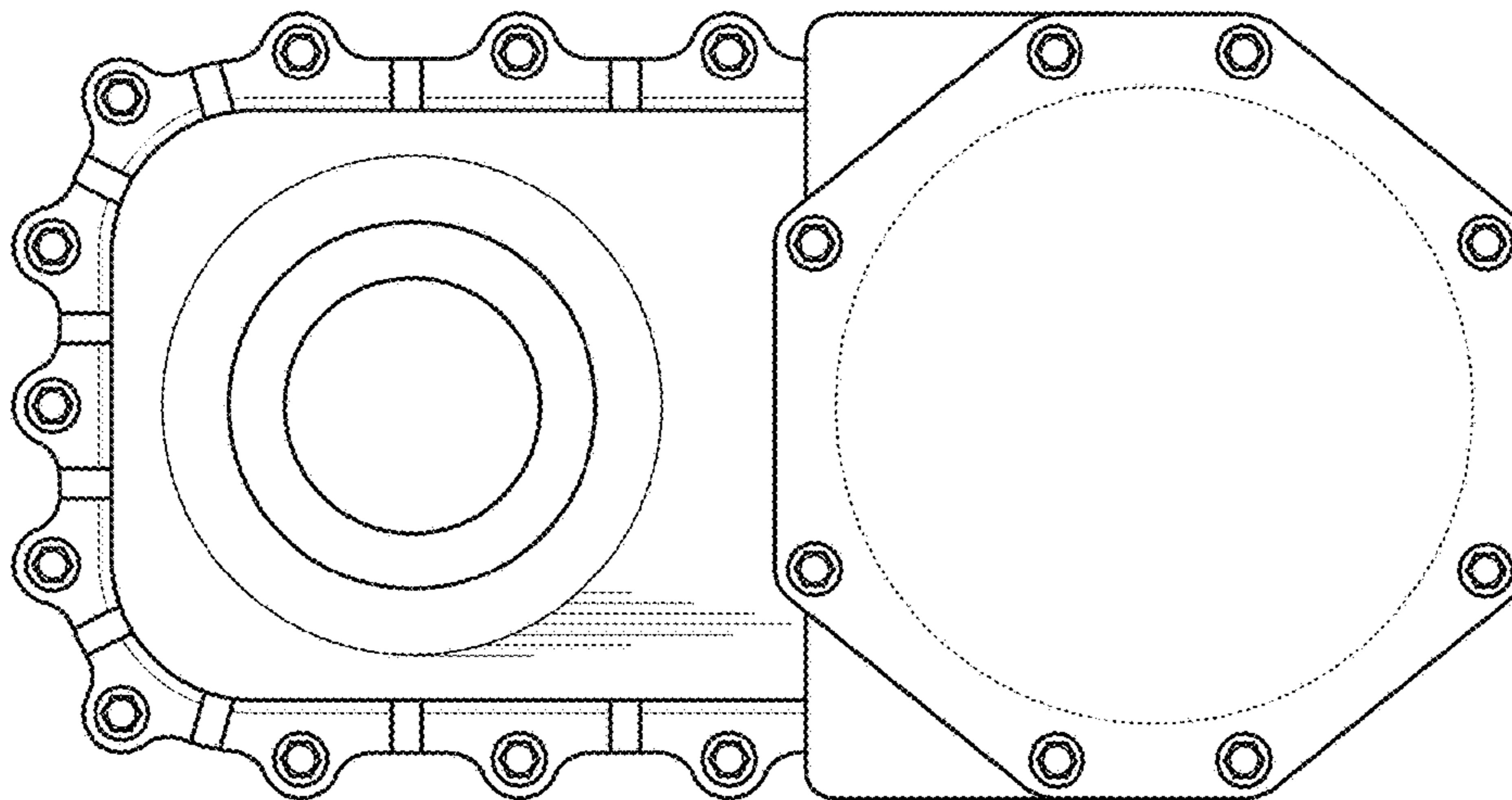


FIG. 7