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Noble et al.

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(54) **SUSPENSION ASSEMBLY**

(75) Inventors: **Shawn D. Noble**, Naperville, IL (US);
Michael P. Robinson, Chicago, IL (US);
Hormoz Kerendian, Buffalo Grove, IL
(US); **Ashley T. Dudding**, Yorkville, IL
(US)

(73) Assignee: **Hendrickson USA, L.L.C.**, Itasca, IL
(US)

(**) Term: **14 Years**

(21) Appl. No.: **29/315,182**

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(51) **LOC (9) Cl.** **12-16**

(52) **U.S. Cl.** **D12/159**

(58) **Field of Classification Search** D12/118,
D12/400, 161, 159, 160; 280/124.155, 124.147,
280/124.145, 124.146, 86.752, 11.225; 188/281,
188/298, 297, 315, 316, 274, 286; 267/195,
267/136, 64.15, 217; 464/173; D21/76;
293/134

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,409,044	A	3/1922	Joseph
1,516,051	A	11/1924	Lundie
1,604,961	A	11/1926	Bell et al.
1,608,507	A	11/1926	Hogan
1,679,528	A	8/1927	Johanson
1,817,325	A	8/1931	Sinkovich

(Continued)

FOREIGN PATENT DOCUMENTS

DE	973418	2/1996
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(Continued)

OTHER PUBLICATIONS

Hendrickson, A Boler Company, Hendrickson Frame Hanger Selection Guide, May 1990.

(Continued)

Primary Examiner—T. Chase Nelson

Assistant Examiner—Michael A Pratt

(74) *Attorney, Agent, or Firm*—McDonnell Boehnen Hulbert & Berghoff LLP

(57) **CLAIM**

The ornamental design for a suspension assembly as shown and described.

DESCRIPTION

FIG. 1 is a perspective view showing the top, front, and right side of a suspension assembly having the inventive design;

FIG. 2 is a front elevational view of the suspension assembly shown in FIG. 1;

FIG. 3 is a back-side elevational view of the suspension assembly shown in FIG. 1;

FIG. 4 is a right side elevational view of the suspension assembly shown in FIG. 1;

FIG. 5 is a left side elevational view of the suspension assembly shown in FIG. 1;

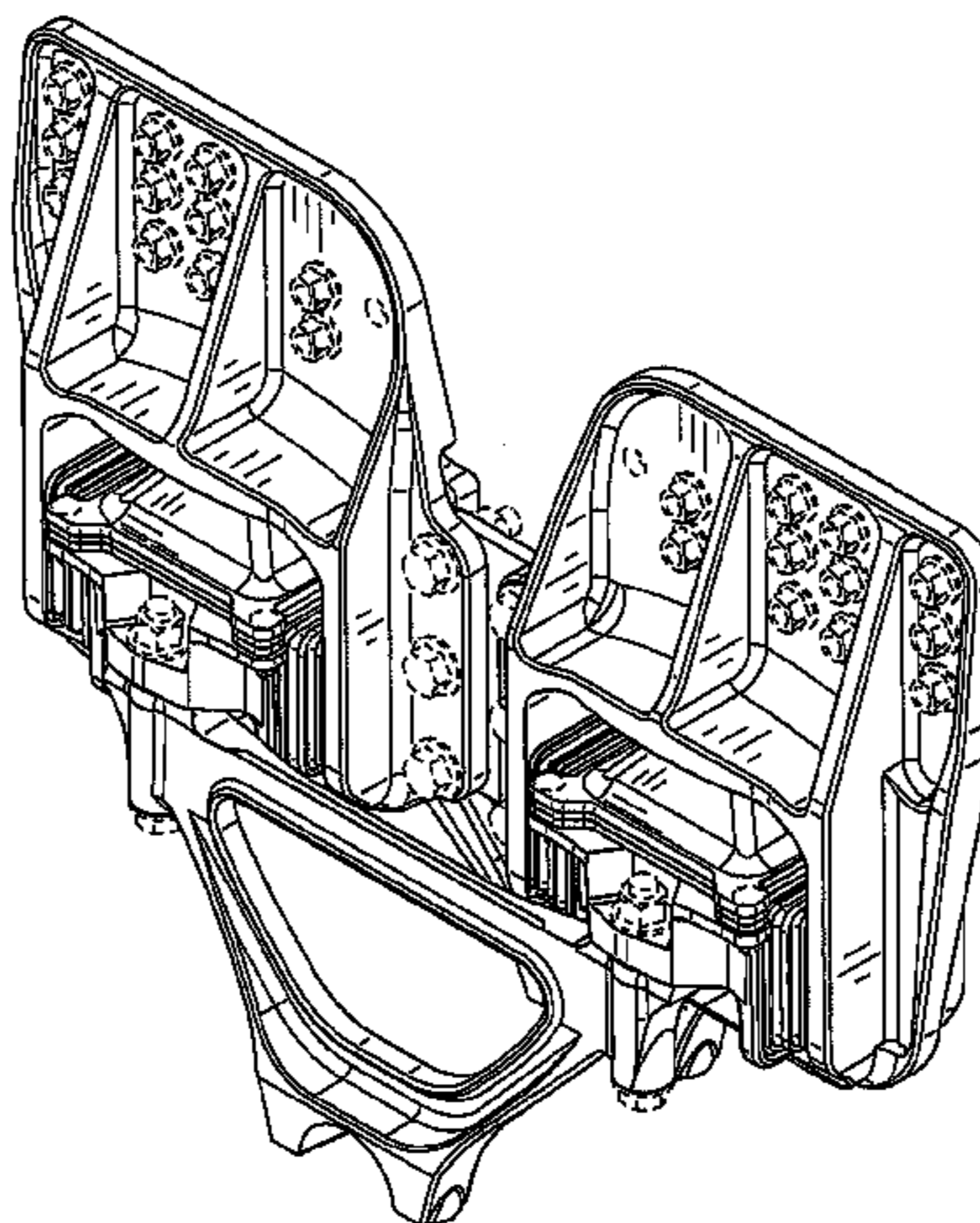
FIG. 6 is a top view of the suspension assembly shown in FIG. 1;

FIG. 7 is a bottom view of the suspension assembly shown in FIG. 1; and,

FIG. 8 is a perspective view showing the top, back-side, and left side of the suspension assembly shown in FIG. 1.

The broken lines showing various fasteners and holes in each of the figures are for the purpose of illustrating an example of an attachment means of the suspension assembly and form no part of the claimed design.

1 Claim, 6 Drawing Sheets



U.S. PATENT DOCUMENTS

1,853,166 A 4/1932 Nibbe
 1,949,363 A 2/1934 Willard
 2,094,335 A 9/1937 Willard et al.
 2,788,222 A 4/1957 Wilson et al.
 2,905,390 A 9/1959 Saul
 2,980,439 A 4/1961 Miller
 3,004,715 A 10/1961 Gadd
 3,121,560 A 2/1964 Reed
 3,279,820 A 10/1966 Hickman
 3,485,040 A 12/1969 Niskanen
 3,539,170 A * 11/1970 Hamel 267/294
 3,545,787 A 12/1970 Miller
 3,580,611 A 5/1971 McNitt
 3,618,971 A 11/1971 Wragg
 3,695,737 A 10/1972 Alexander et al.
 3,797,851 A * 3/1974 Hirst 267/294
 3,817,551 A 6/1974 Moore
 3,955,808 A 5/1976 Jorn et al.
 D240,239 S 6/1976 Calandrino
 3,984,125 A 10/1976 Paton et al.
 3,997,151 A 12/1976 Leingang
 4,082,316 A 4/1978 Raidel
 4,095,690 A 6/1978 Baldwin
 4,132,433 A 1/1979 Willett
 4,144,978 A 3/1979 Drake
 4,162,799 A 7/1979 Willetts
 4,182,338 A 1/1980 Stanulis
 4,193,612 A 3/1980 Masser
 4,213,633 A 7/1980 Moore
 4,358,096 A 11/1982 Paton et al.
 4,371,189 A 2/1983 Raidel
 4,382,547 A 5/1983 Phillips
 4,420,171 A 12/1983 Raidel
 4,452,007 A 6/1984 Martin
 4,486,029 A 12/1984 Raidel
 4,504,080 A 3/1985 VanDenberg
 4,705,294 A * 11/1987 Raidel 280/124.116
 4,753,456 A 6/1988 Booher
 4,793,597 A 12/1988 Smith
 D306,476 S 3/1990 Millard
 4,944,402 A 7/1990 Wu
 4,995,636 A 2/1991 Hall et al.
 5,114,178 A 5/1992 Baxter
 5,150,918 A 9/1992 Heitzmann
 5,237,933 A 8/1993 Bucksbee
 D344,254 S 2/1994 Zimmerman
 5,327,674 A 7/1994 Powell
 5,413,320 A * 5/1995 Herbst 267/140.13
 D377,961 S 2/1997 Dickson et al.
 5,676,356 A 10/1997 Ekonen et al.
 D390,305 S 2/1998 Dickson et al.
 5,753,429 A 5/1998 Pugh
 5,810,337 A 9/1998 McLaughlin
 5,868,384 A 2/1999 Anderson
 5,887,881 A 3/1999 Hatch
 5,938,221 A 8/1999 Wilson
 5,957,441 A 9/1999 Tews
 5,989,075 A 11/1999 Hsiao et al.
 D423,342 S 4/2000 Popseco
 6,129,369 A 10/2000 Dudding
 6,176,345 B1 1/2001 Perkins et al.
 6,189,904 B1 2/2001 Gentry et al.
 6,276,674 B1 8/2001 Randell
 6,328,294 B1 12/2001 Palinkas
 6,478,321 B1 11/2002 Heitzmann
 D471,888 S 3/2003 Sollard
 D474,274 S 5/2003 Walters
 6,572,087 B2 6/2003 Schleinitz et al.
 6,585,286 B2 7/2003 Adema et al.
 6,659,438 B2 12/2003 Michael et al.
 6,666,474 B2 12/2003 Pavuk

D496,887 S 10/2004 Carlson
 6,817,301 B1 11/2004 Bullock
 6,877,623 B2 4/2005 Salis
 D507,658 S 7/2005 Wescott, III
 D515,942 S 2/2006 Hamblin et al.
 D515,943 S 2/2006 Hamblin et al.
 D519,104 S 4/2006 Richter
 7,185,903 B2 3/2007 Dove
 D543,492 S 5/2007 Lyew
 7,229,088 B2 6/2007 Dudding et al.
 7,234,723 B2 6/2007 Sellers
 D551,315 S 9/2007 Zimmerman
 7,303,200 B2 12/2007 Ramsey
 7,320,538 B2 1/2008 Ko et al.
 D603,303 S 11/2009 Noble et al.
 D606,459 S 12/2009 Noble et al.
 D610,952 S * 3/2010 Noble et al. D12/159
 D615,005 S 5/2010 Noble et al.
 2002/0163165 A1 11/2002 Adema et al.
 2003/0047907 A1 3/2003 Hicks et al.
 2004/0262877 A1 12/2004 Sellers
 2005/0110233 A1 5/2005 Hedenberg
 2006/0071441 A1 4/2006 Mathis
 2006/0208445 A1 9/2006 Gideon
 2007/0262547 A1 11/2007 Warinner
 2008/0018070 A1 1/2008 Gottschalk
 2008/0030006 A1 2/2008 Sellers
 2008/0122146 A1 5/2008 Herntier et al.
 2008/0134413 A1 6/2008 Guo
 2008/0258361 A1 10/2008 Wen et al.
 2008/0290572 A1 11/2008 Desprez et al.
 2009/0008846 A1 1/2009 Yamakawa et al.
 2009/0108086 A1 4/2009 Mospan et al.
 2009/0230650 A1 9/2009 Mayen et al.

FOREIGN PATENT DOCUMENTS

EP 1911661 A1 4/2008
 EP 2006129 A1 12/2008
 FR 2550918 3/1985
 FR 2797432 2/2001
 GB 2128942 A 5/1984
 GB 2226867 A 7/1990
 GB 2252276 A 8/1992
 GB 2069424 A 8/2010
 WO 02/42097 A2 5/2002
 WO 2006/067551 A1 6/2006

OTHER PUBLICATIONS

Hendrickson, A Boler Company, Hendrickson RS Series, Single Axle Suspension, Sep. 1995.
 Hendrickson, RS Series Rubber Load Cushion, Only Hendrickson makes choosing a heavy-duty suspension this easy, Jun. 1993.
 Hendrickson, A Boler Company, HN Series Technical Sales Publication, Jun. 1997.
 Hendrickson Suspension, RS Series rubber load cushion, Jul. 1991.
 Hendrickson Mfg., Tandem Division, Wide spread equalizing beams, sales bulletin, May 1981.
 Hendrickson Mfg. Co., Tandem Division, Hendrickson Tandem Suspensions for GMC Trucks, Aug. 1979.
 Hendrickson, The Boler Company, RS Frame Hanger, Dec. 1997.
 Hendrickson, A Boler Company, RS Series Rubber Load Cushion Suspensions, Mar. 1996.
 Hendrickson, A Boler Company, RS Series Rubber Load Cushion Suspensions, Jul. 1996.
 Hendrickson, A Boler Company, RS Series Rubber Load Cushion, Mar. 1998.
 Hendrickson Suspension, HN Series Premium Rubber, Hendrickson introduces a completely new concept in Walking Beam Suspension, Jun. 1993.
 Hendrickson Suspension, A Boler Company, Hendrickson HNT Series, Feb. 1992.
 Hendrickson Suspension, Sales Engineering Update, Mar. 1993.

- Hendrickson Truck Suspension Systems, A Boler Company, RS Series Rubber Load Cushion, Dec. 1996.
- Hendrickson Truck Suspension Systems, A Boler Company, RS Series Rubber Load Cushion, Apr. 1998.
- Hendrickson Truck Suspension Systems, A Boler Company, HN Series VariRate Spring System, May 1997.
- Hendrickson Truck Suspension Systems, A Boler Company, HN Series VariRate Spring System, Nov. 1997.
- Hendrickson Truck Suspension Systems, A Boler Company, HN Series VariRate Spring System, Sep. 1998.
- Hendrickson Truck Suspension Systems, A Boler Company, HN Series VariRate Spring System, Jul. 1999.
- Hendrickson, HN Series VariRate Spring System, Nov. 2000.
- Hendrickson, HN Series VariRate Spring System, Nov. 2005.
- Hendrickson Truck Suspension Systems, A Boler Company, HN 402, Feb. 1996.
- Hendrickson Truck Suspension Systems, A Boler Company, R Series Solid Mount, Jul. 1999.
- Hendrickson Truck Suspension Systems, A Boler Company, RS Series Rubber Load Cushion, Jun. 1999.
- Hendrickson, Haulmaax Heavy Duty Suspension, Oct. 2001.
- Hendrickson, Haulmaax Heavy Duty Suspension, Dec. 2003.
- Hendrickson, Haulmaax Heavy Duty Suspension, Mar. 2005.
- Hendrickson, Haulmaax Heavy Duty Suspension, Jan. 2007.
- Hendrickson, Haulmaax Heavy Duty Suspension, Mar. 2008.
- Hendrickson, Assembly Instructions Haulmaax, Subject: Kit Nos. 64178-003 & 004, Feb. 2003.
- Hendrickson, Assembly Instructions Haulmaax, Subject: Tie-bar Bolster Spring Kit Nos. 64179-037, Jun. 2006.
- Hendrickson, Assembly Instructions Haulmaax, Subject: Outboard Frame Bracket for Paccar Vehicles Built after May 1, 2005 through Aug. 31, 2006, Oct. 2006.
- Hendrickson, Assembly Instructions Haulmaax Saddle Assembly, Subject: Service Kit No. 57974-048, Dec. 2008.
- Hendrickson, Technical Bulletin HN 402/462/522, Subject: Auxiliary Spring Shim Design, Oct. 2000.
- Hendrickson, Technical Bulletin HN 402/462/522, Subject: Auxiliary Spring Shim Design, Dec. 2000.
- Hendrickson, Technical Bulletin HN 402/462/522, Subject: Auxiliary Spring Shim Design, Jun. 2006.
- Hendrickson, Technical Bulletin Haulmaax Series, Subject: Mandatory Shock Applications, Nov. 2004.
- Hendrickson, Technical Bulletin R, RS, RT/RTE 46K Capacity, Subject: 46K Heavy-Duty Beam Option, Dec. 2004.
- Hendrickson, Technical Bulletin Haulmaax, Subject: 54" Equalizing Beam Assembly, Oct. 2005.
- Hendrickson, Technical Bulletin Haulmaax 460, Subject: Bolster Spring Assembly with Tie-bar, Jun. 2006.
- Hendrickson Truck Suspension Systems, A Boler Company, Sales engineering update, Subject: HN-402/462 Auxiliary Spring Assembly, Aug. 1998.
- Hendrickson Truck Suspension Systems, A Boler Company, Sales engineering update, Subject: Model Designation and Discontinuation, Aug. 1999.
- Hendrickson Truck Suspension Systems, A Boler Company, Sales engineering update, Subject: Equalizer Beam, Aug. 1999.
- Hendrickson, Parts List RS Series, Nov. 2004.
- Hendrickson, Parts List Haulmaax, May 2002.
- Hendrickson, Parts List Haulmaax, Jul. 2003.
- Hendrickson, Parts List Haulmaax, Jul. 2006.
- Hendrickson, Parts List Haulmaax, Dec. 2007.
- Hendrickson, Parts List Rs 400/460/480/520 Jan. 1998.
- Hendrickson, Parts List HN 402/462, Sep. 1997.
- Hendrickson, Parts List HN Series, Dec. 2004.
- Hendrickson Truck Suspension Systems, A Boler Company, Technical Publication RS-340 thru 520, Subject: Springing: Frame Hangers, Load Cushions and Saddle Assembly, Jul. 1993.
- Hendrickson Truck Suspension Systems, A Boler Company, Technical Publication HN Series Truck & Trailer Suspension No: 17730-198, Mar. 1993.
- Hendrickson, Technical Procedure HN/HNT-400/460 Truck & Trailer Suspension in Production Nov. 1988-Sep. 1996, Apr. 1998.
- Hendrickson Truck Suspension Systems, A Boler Company, Technical Publication HN 402 Series, Subject: Service Instructions, Aug. 1996.
- Hendrickson Truck Suspension Systems, A Boler Company, Technical Publication HN 402/462 Series, Subject: Service Instructions, Aug. 1998.
- Hendrickson, Technical Procedure Haulmaax, Subject: Service Instructions, May 2002.
- Hendrickson, Technical Procedure Haulmaax, Subject: Service Instructions, Jun. 2007.
- Hendrickson, Technical Procedure Haulmaax, Subject: Pre-delivery Inspection and Preventive Maintenance, Apr. 2006.
- Hendrickson, Technical Procedure Haulmaax, Subject: Service Instructions, Dec. 2007.
- Hendrickson, Technical Procedure R/RS/RT Heavy Duty, Subject: 650K/850K/1000K Pound Capacity Beam End Connection Tightening Torque Procedure, Jul. 2006.
- Hendrickson, RS Series Rubber Load Cushion, Feb. 2000.
- MOR/ryde, The MOR/ryde Steer and Drive Axle Suspension Systems, Mar. 7, 2008.
- MOR/ryde, Company Profile, downloaded from the World Wide Web at <http://www.morrydede.com/php/about/profile/php> on Feb. 28, 2008.
- MOR/ryde, T/A Modular Rubber Suspension System, Service Manual, Mar. 5, 2003.
- MOR/ryde, Tandem Axle Rubber Suspension System, Service Manual, Suspension Codes: T01-01 and L01-01, Mar. 5, 2003.
- MOR/ryde, RL Rubber Leaf Suspension System, Owner's Manual, Mar. 12, 2003.
- MOR/ryde, Commercial Trailer Suspension, Jun. 1973.
- MOR/ryde, School Bus Suspension, Aug. 1973.
- MOR/ryde, A rubber spring . . . heart of the MOR/ryde system, Aug. 1973.
- Jorn, Technology in Rubber—Metal, Sep. 29, 2008.
- Hendrickson, Parts List RS Series, Apr. 2008.
- Hendrickson, Technical Procedure, R/RS Heavy Duty, Subject: 85K/100K/120K lbs Capacity Tightening Torque for Torque Rod and Saddle Assembly Fasteners, Oct. 2008.
- Hendrickson USA, L.L.C., Technical Procedure R/RS/RT Heavy Duty, Lit. No. 17730-149, Revision C, Jul. 2006.
- Hendrickson, HN FR Series, HN FR Suspension 42—58K Fire/Rescue, Feb. 2009.
- Hendrickson, Haulmaax Heavy-Duty Suspension, Jan. 2009.
- Kenworth Truck Company, Haulmaax, May 14, 2009.
- U.S. Appl. No. 12/045,069, filed Mar. 10, 2008 and entitled "Elastomeric Spring Vehicle Suspension."
- U.S. Appl. No. 12/334,195, filed Dec. 12, 2008 and entitled "Modular Suspension System and Components Thereof."
- U.S. Appl. No. 12/545,828, filed Aug. 22, 2009 and entitled "Tie-plate and Frame Hanger of a Suspension Assembly."
- U.S. Appl. No. 29/329,343, filed Dec. 12, 2008 and entitled "Suspension Saddle."
- U.S. Appl. No. 29/329,354, filed Dec. 12, 2008 and entitled "Suspension Assembly."
- U.S. Appl. No. 29/339,134, filed Jun. 24, 2009 and entitled "Suspension Assembly."
- U.S. Appl. No. 29/344,282, filed Sep. 25, 2009 and entitled "Suspension Spring."
- U.S. Appl. No. 29/344,283, filed Sep. 25, 2009 and entitled "Suspension Spring."
- U.S. Appl. No. 29/344,284, filed Sep. 25, 2009 and entitled "Suspension Spring."
- U.S. Appl. No. 29/329,359, filed Dec. 12, 2008 and entitled "Suspension Spring."
- U.S. Appl. No. 29/337,974, filed Jun. 2, 2009 and entitled "Progressive Rate Spring for a Suspension."
- U.S. Appl. No. 29/329,338, filed Dec. 12, 2008 and entitled "Shear Spring for a Suspension."
- U.S. Appl. No. 29/337,985, filed Jun. 2, 2009 and entitled "Spring Housing for a Suspension."
- U.S. Appl. No. 29/339,128, filed Jun. 24, 2009 and entitled "Spring Mount."

U.S. Appl. No. 29/339,132, filed Jun. 24, 2009 and entitled "Spring Housing."

U.S. Appl. No. 29/337,973, filed Jun. 2, 2009 and entitled "Saddle for a Suspension."

U.S. Appl. No. 29/337,977, filed Jun. 2, 2009 and entitled "Spring Mount for a Suspension."

U.S. Appl. No. 29/329,357, filed Dec. 12, 2008 and entitled "Spring Housing for a Suspension."

European Patent Office, International Search Report for International Application No. PCT/US2009/036662, Feb. 17, 2010.

European Patent Office, Written Opinion of the International Searching Authority for International Application No. PCT/US2009/036662, Feb. 17, 2010.

European Patent Office, International Search Report the International Searching Authority for International Application No. PCT/US2009/056575, Feb. 12, 2010.

European Patent Office, Written Opinion of the International Searching Authority for International Application No. PCT/US2009/056575, Feb. 12, 2010.

Hendrickson Truck Suspension Systems, A Boler Company, Bus Air Ride Suspensions, Oct. 1998.

Hendrickson, Technical Procedure Non-Steerable Suspension Systems, Subject: Installation Instructions, LIT. No. H621, Dec. 2003.

U.S. Appl. No. 29/342,335, filed Aug. 22, 2009 and entitled Suspension Tie-plate.

Wikipedia - File:Tie plates.jpg. http://en.wikipedia.org/wiki/File:Tie_plates.jpg. Downloaded from the World Wide Web on Jul. 28, 2009.

Wikipedia - Tie plate, http://en.wikipedia.org/wiki/Tie_plate. Downloaded from the World Wide Web on Jul. 28, 2009.

Answers.com - tie plate. <http://www.answers.com/topic/tie-plate>. Downloaded from the World Wide Web on Jul. 28, 2009.

U.S. Appl. No. 12/876,158, filed on Sep. 5, 2010, entitled Suspension Assembly with Tie-Plate.

Hydropneumatic Suspension - Wikipedia, the free encyclopedia, downloaded from the World Wide Web at http://en.wikipedia.org/wiki/hydropneumatic_suspension on Nov. 11, 2009.

PT-Tuning, downloaded from the World Wide Web at <http://pt-tuning.com/pdfs/suspensionInstal.pdf> Score:1, Aug. 11, 2003.

Progressive Springs - Linear Springs, downloaded from the World Wide Web at <http://www.scoobytuner.com/tuning/?tSfid1=16&tuningID=21> on Nov. 11, 2009.

Vincent Ciulla, "Progressive Rate Spring," downloaded from the World Wide Web at <http://autorepair.about.com/library/glossary/bidef/227.htm?p=1> on Nov. 11, 2009.

Paul Mocioce, Rouch Industries, Inc., Viscoelastic Damping 101, Sep. 9, 2002.

Kenworth Truck Company, Haulmaxx, May 14, 2009.

Elastomer, downloaded from the World Wide Web at <http://en.wikipedia.org/wiki/Elastomer> on Nov. 24, 2008.

* cited by examiner

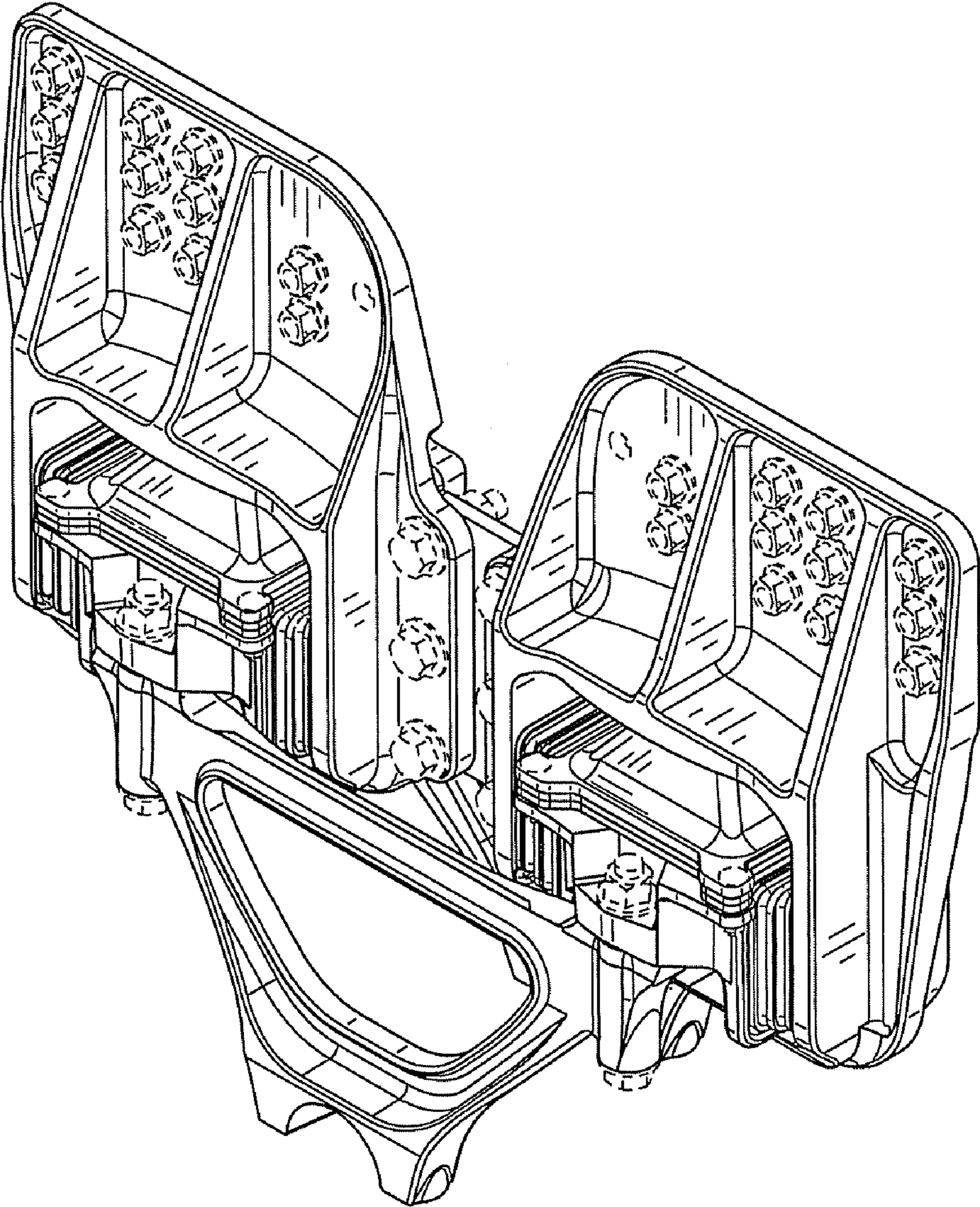


FIG. 1

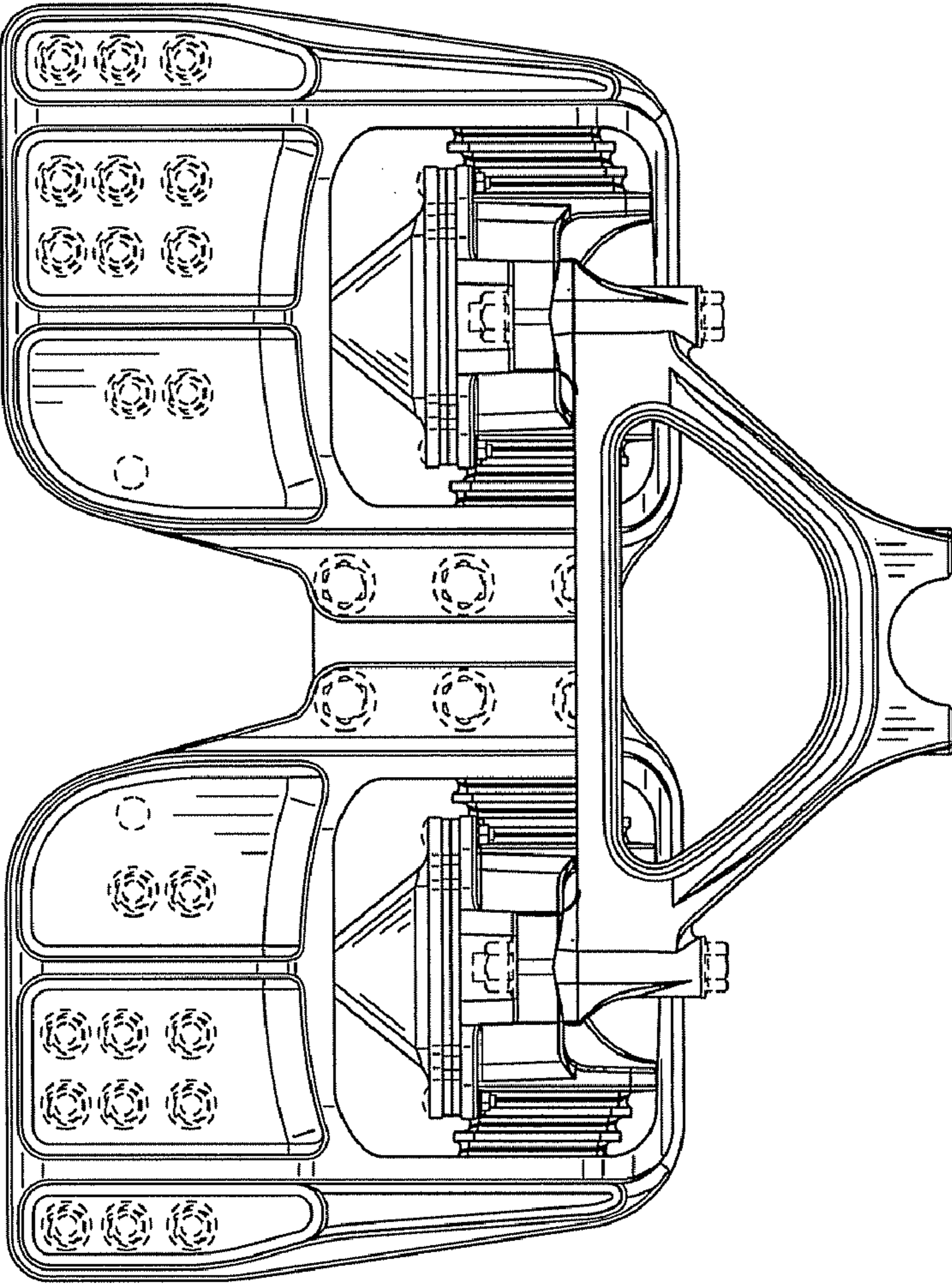


FIG. 2

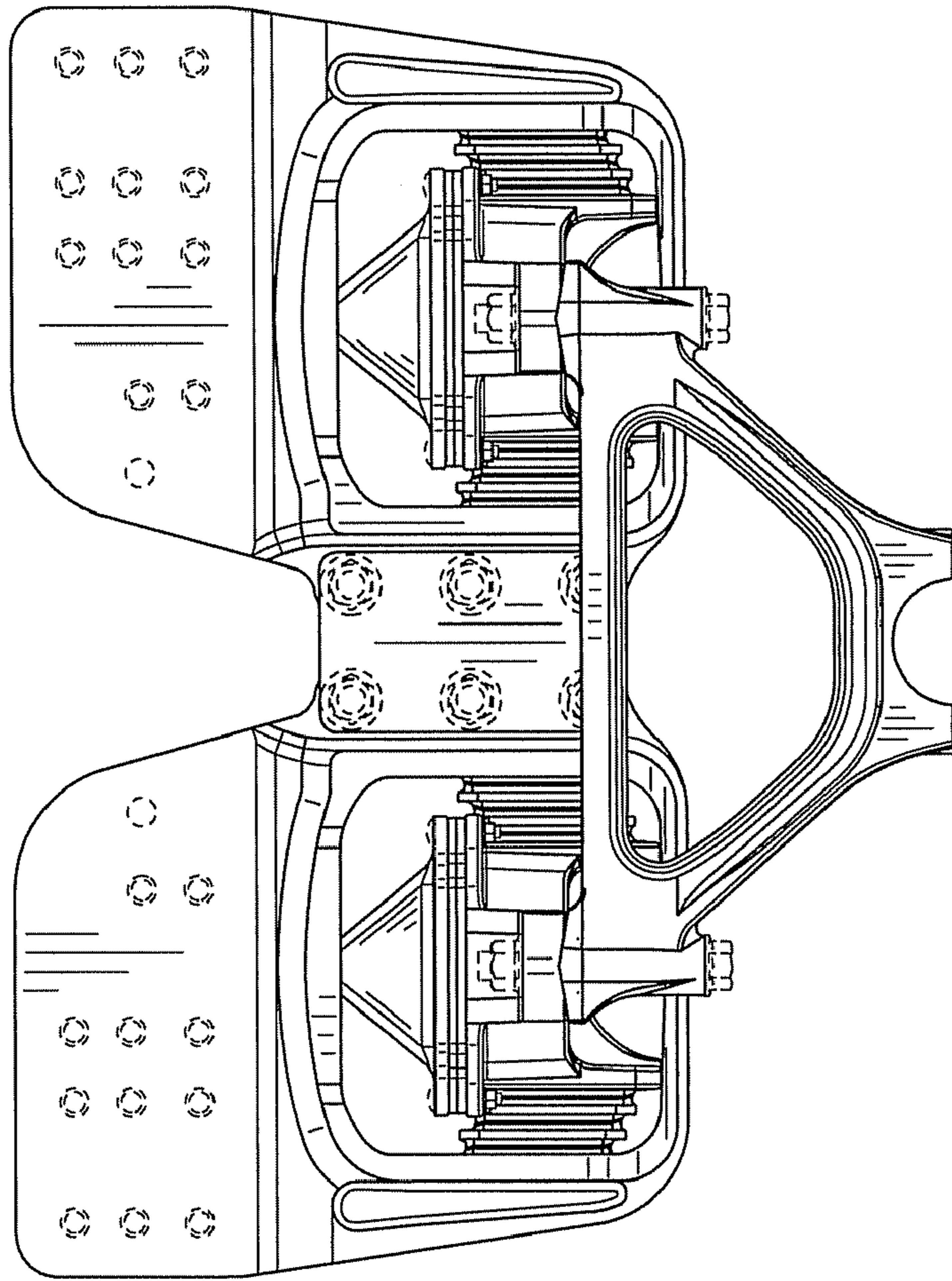


FIG. 3

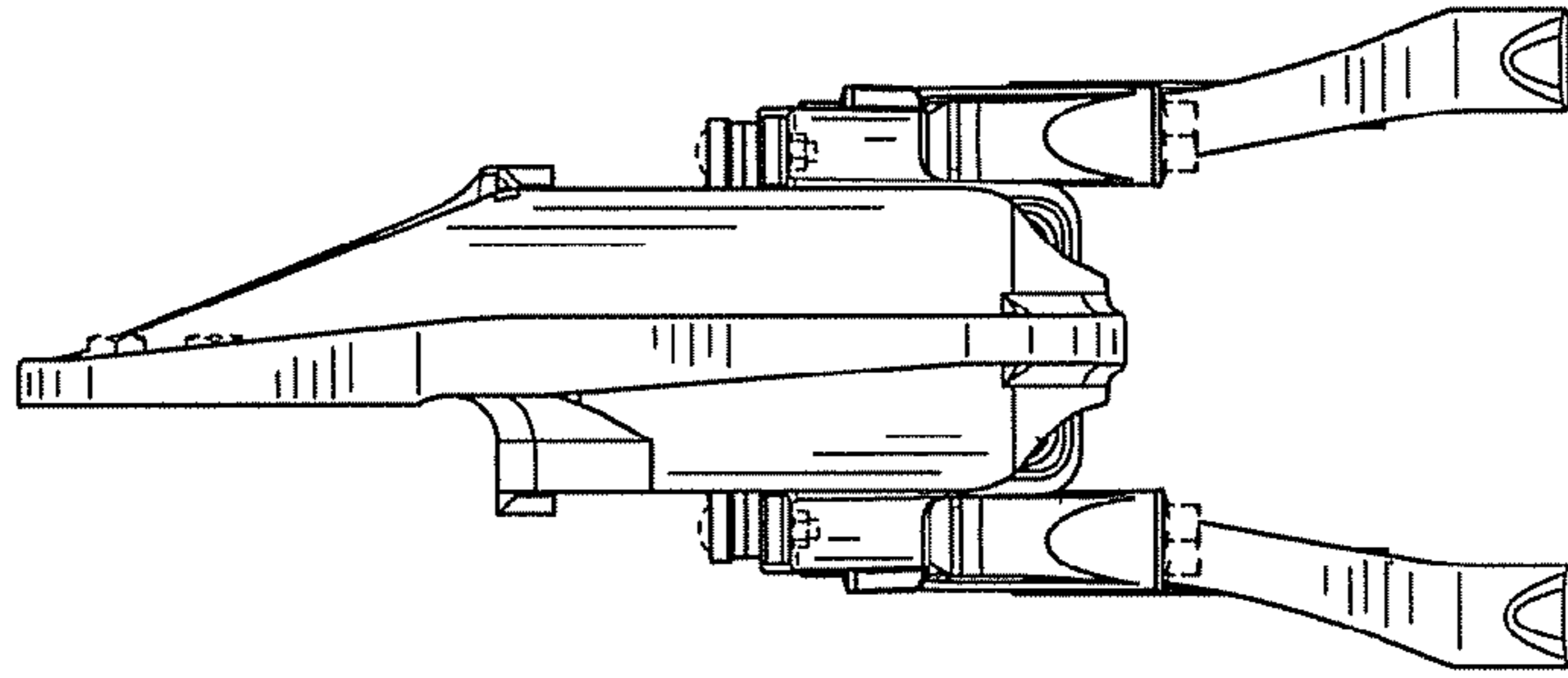


FIG. 5

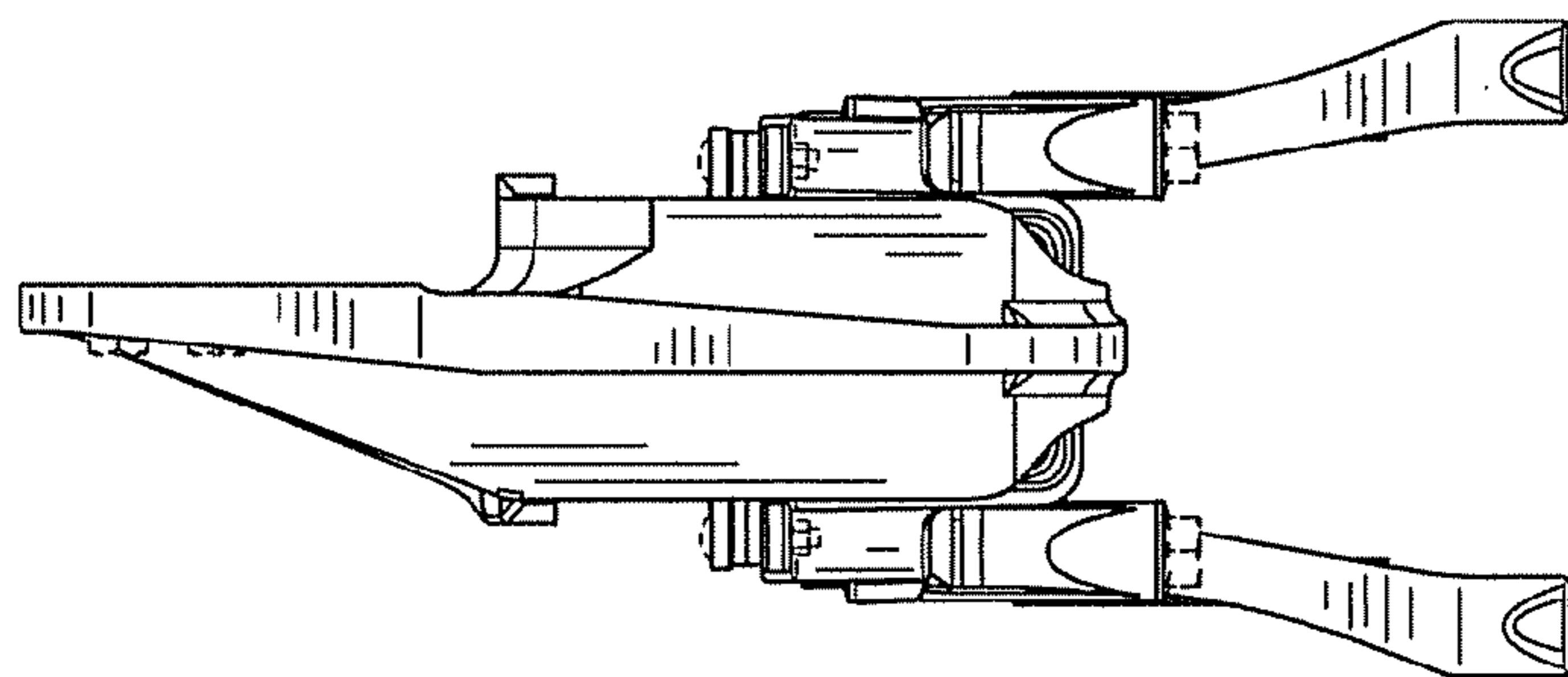


FIG. 4

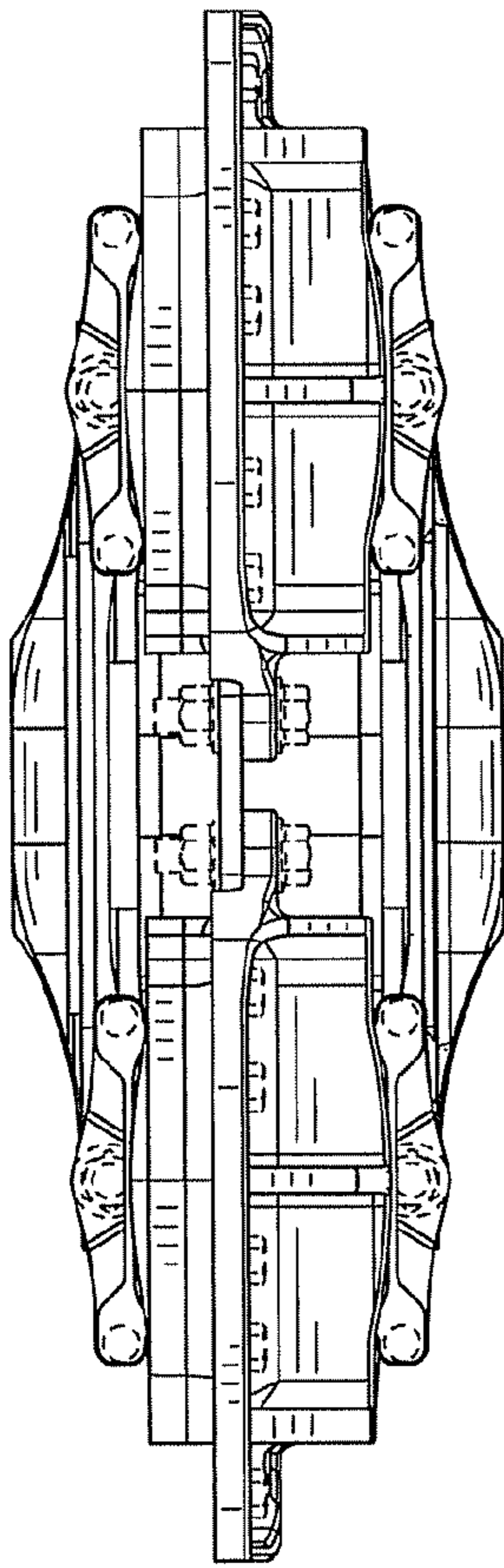


FIG. 6

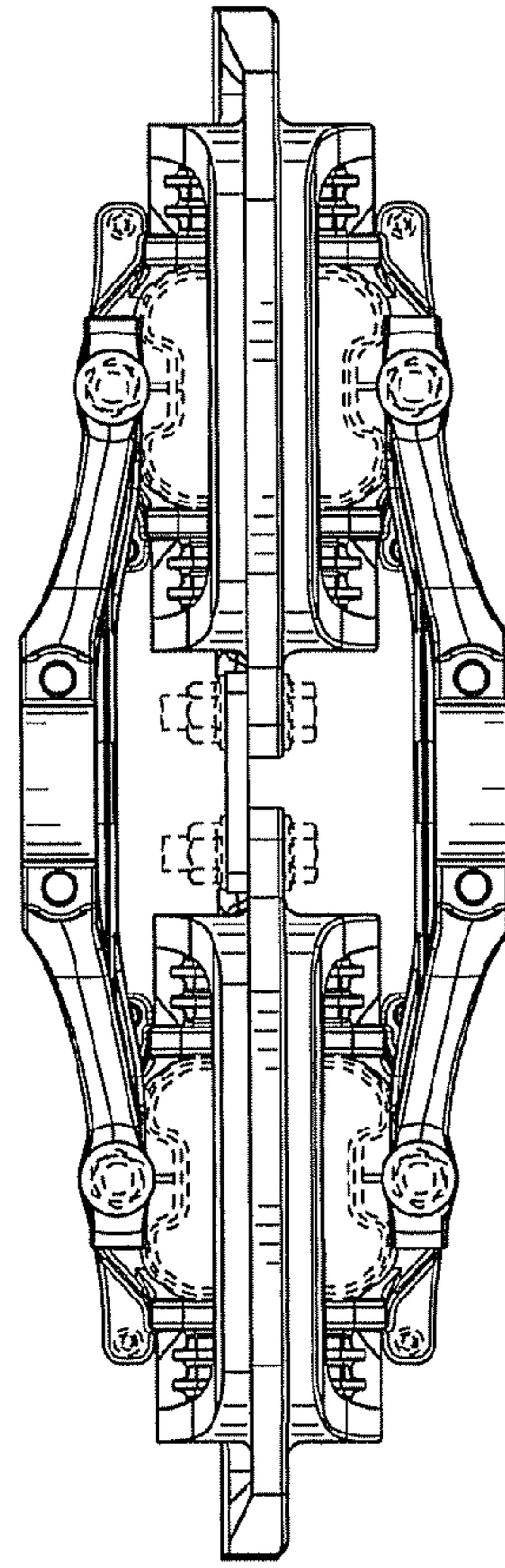


FIG. 7

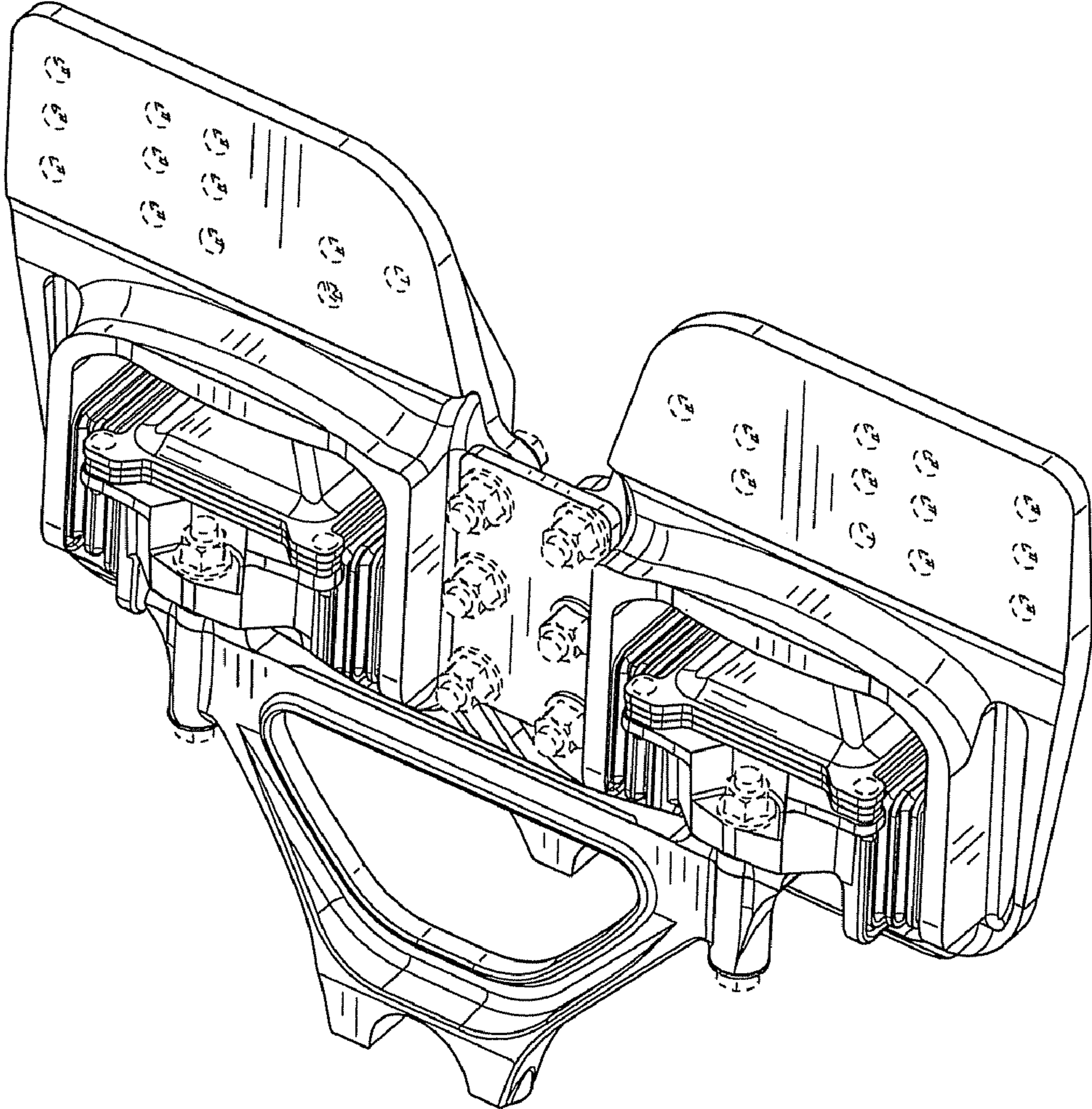


FIG. 8