

(No Model.)

6 Sheets—Sheet 1.

S. Z. DE FERRANTI.  
DYNAMO ELECTRIC MACHINE.

No. 408,404.

Patented Aug. 6, 1889.

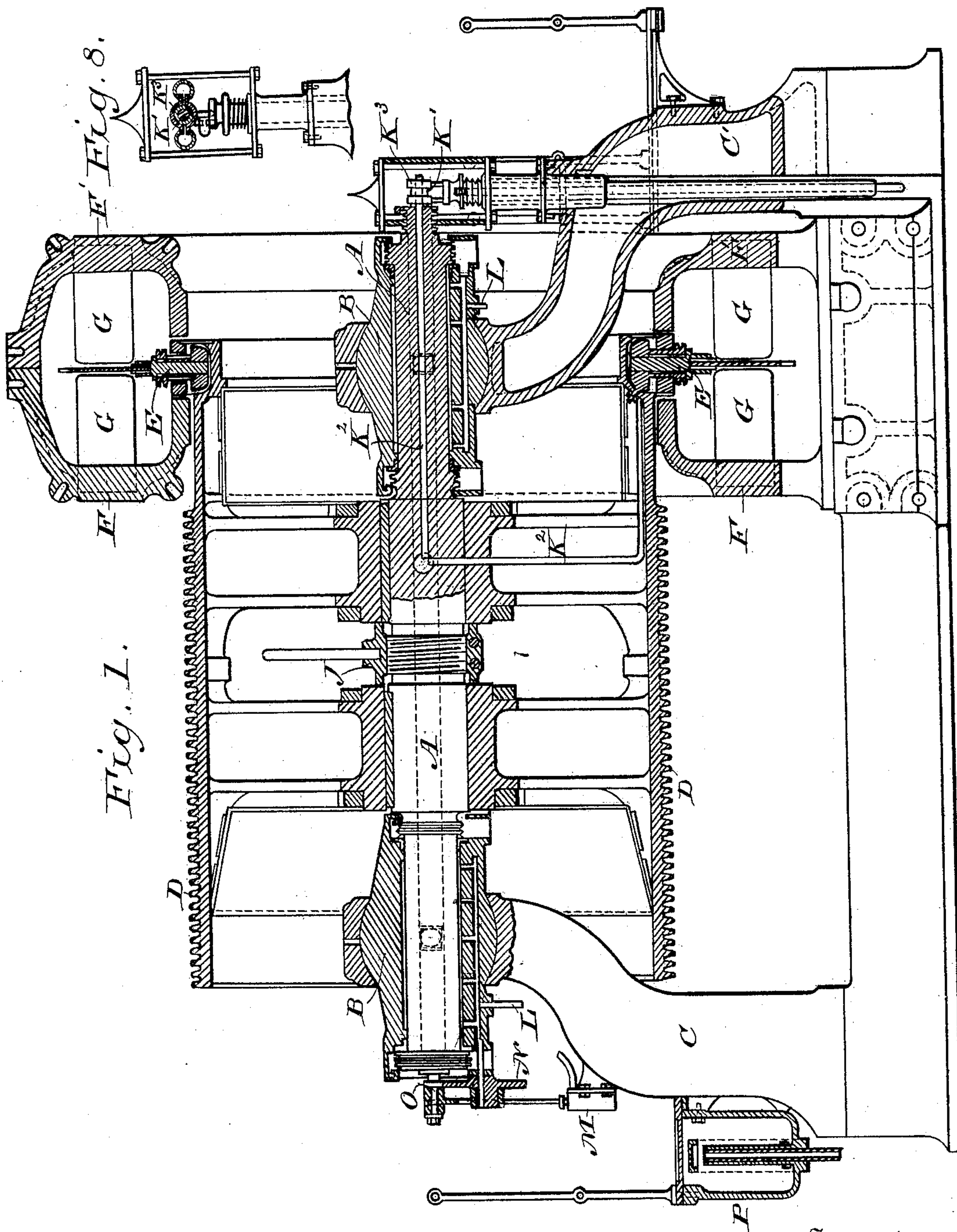


Fig. 1.

Witnesses

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Attorneys

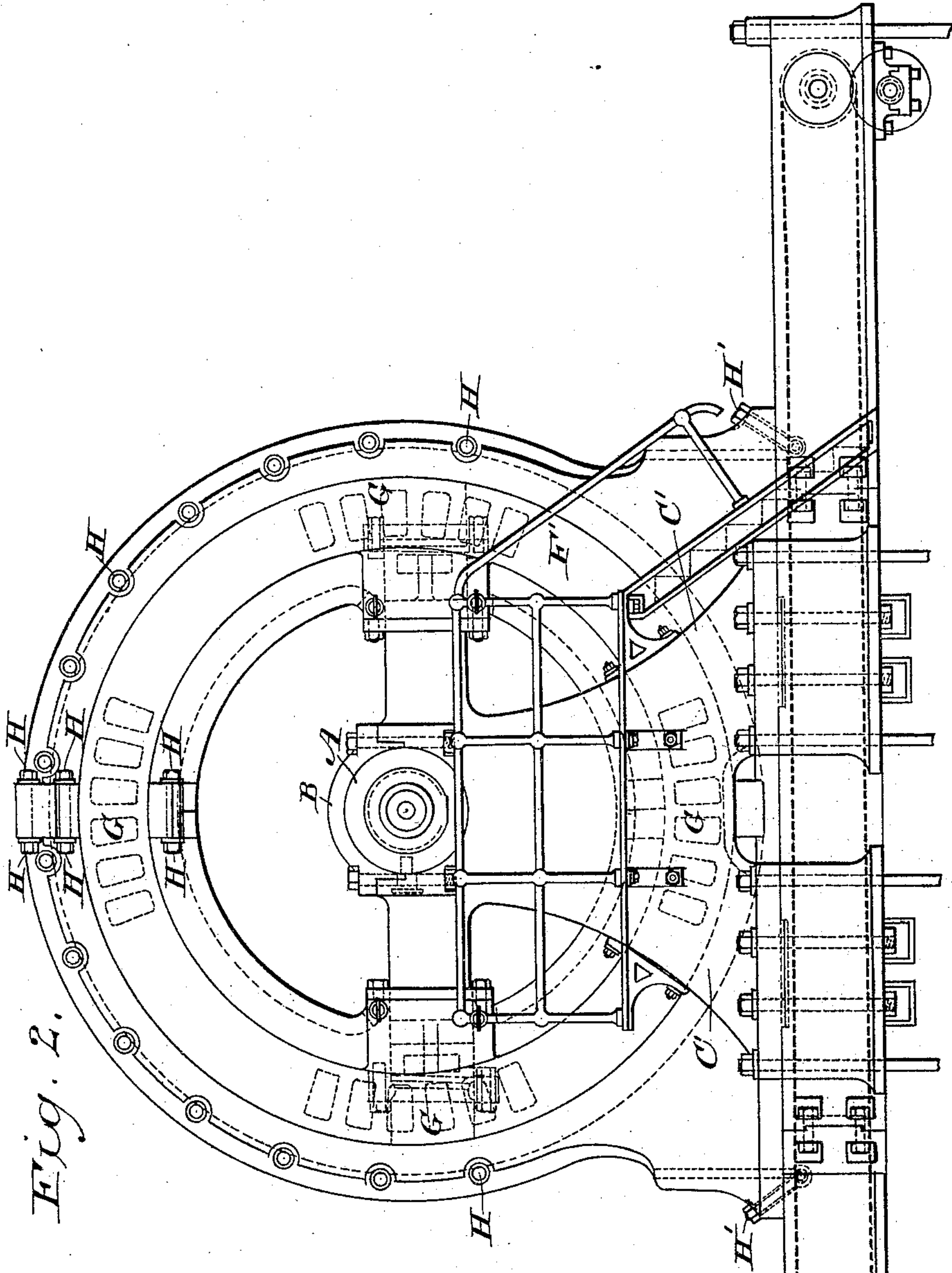
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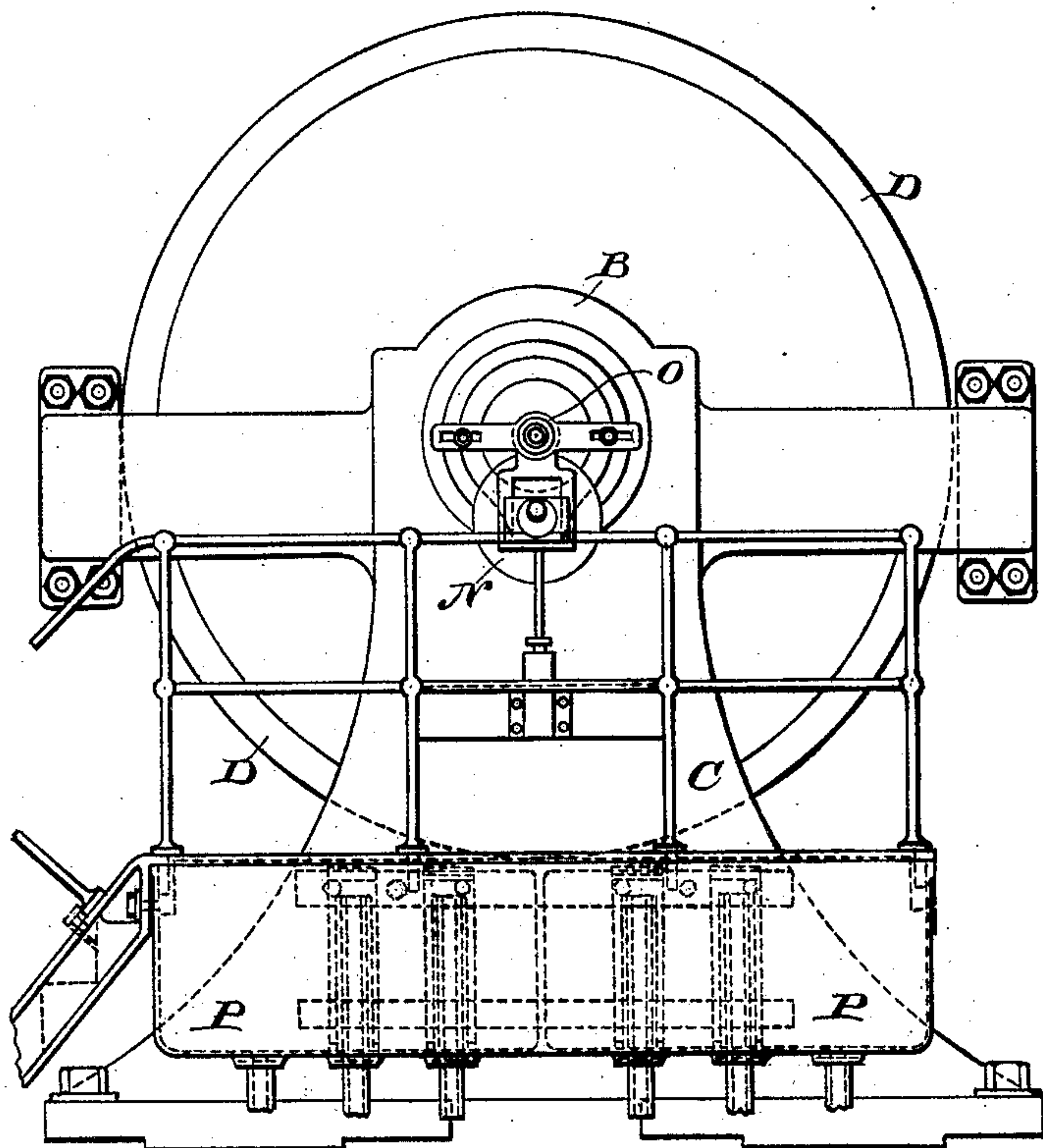
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*Fig. 3.*



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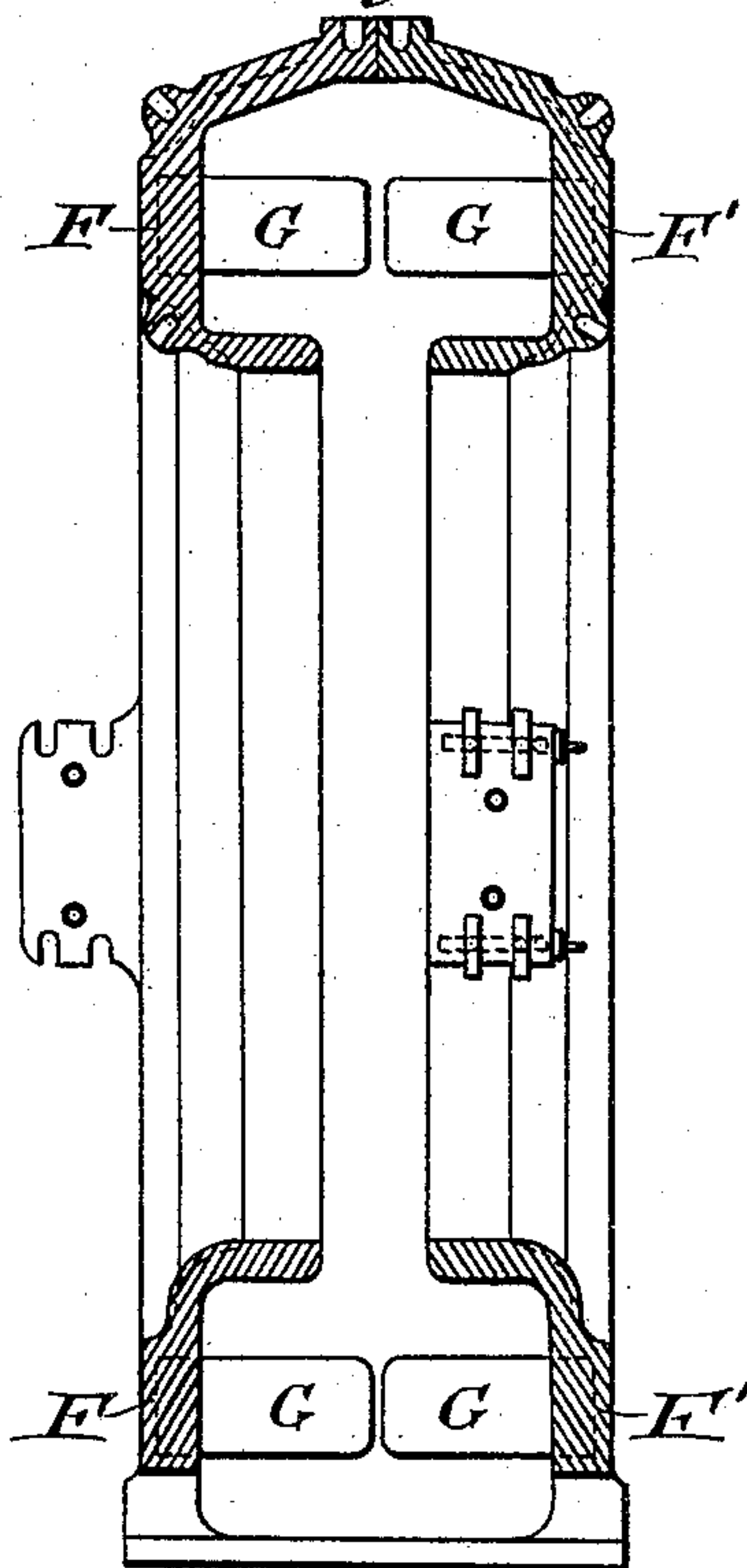
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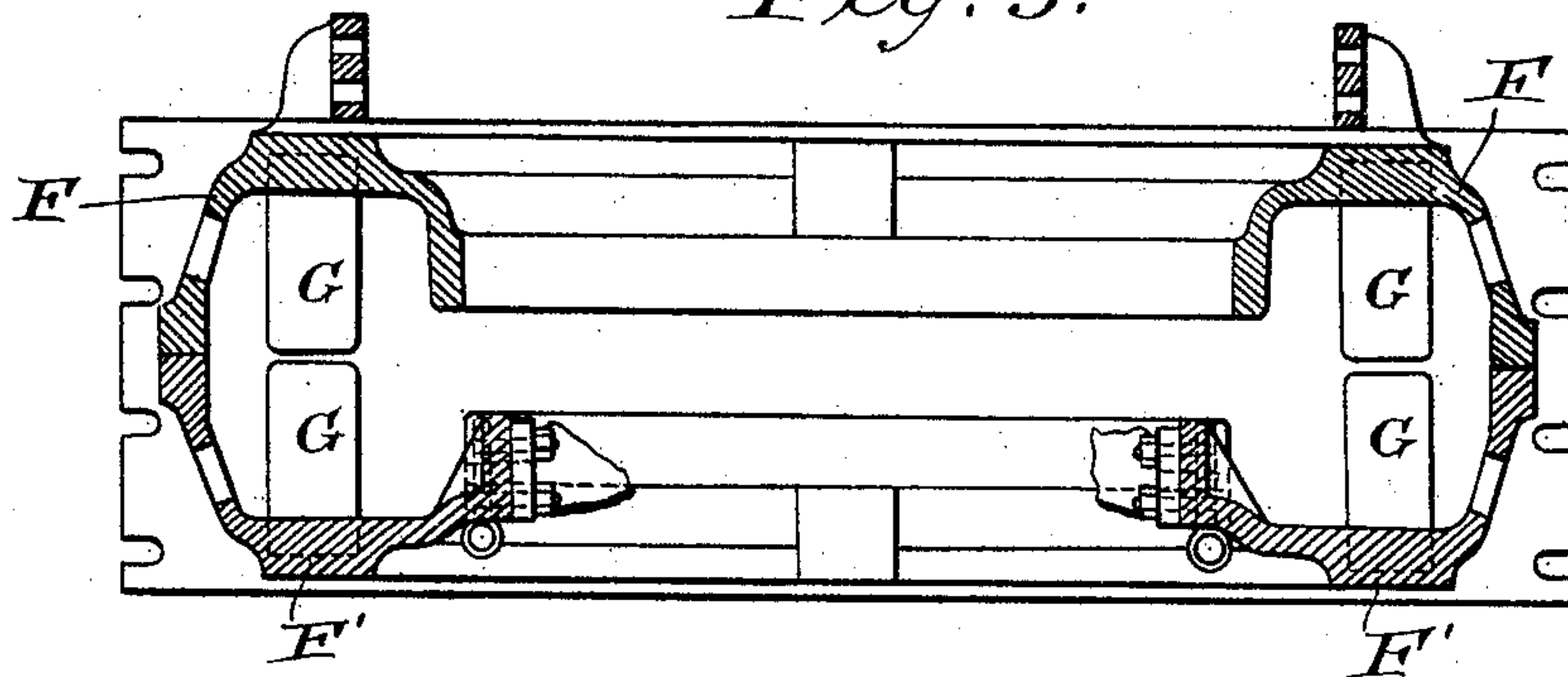
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*Fig. 4.*



*Fig. 5.*



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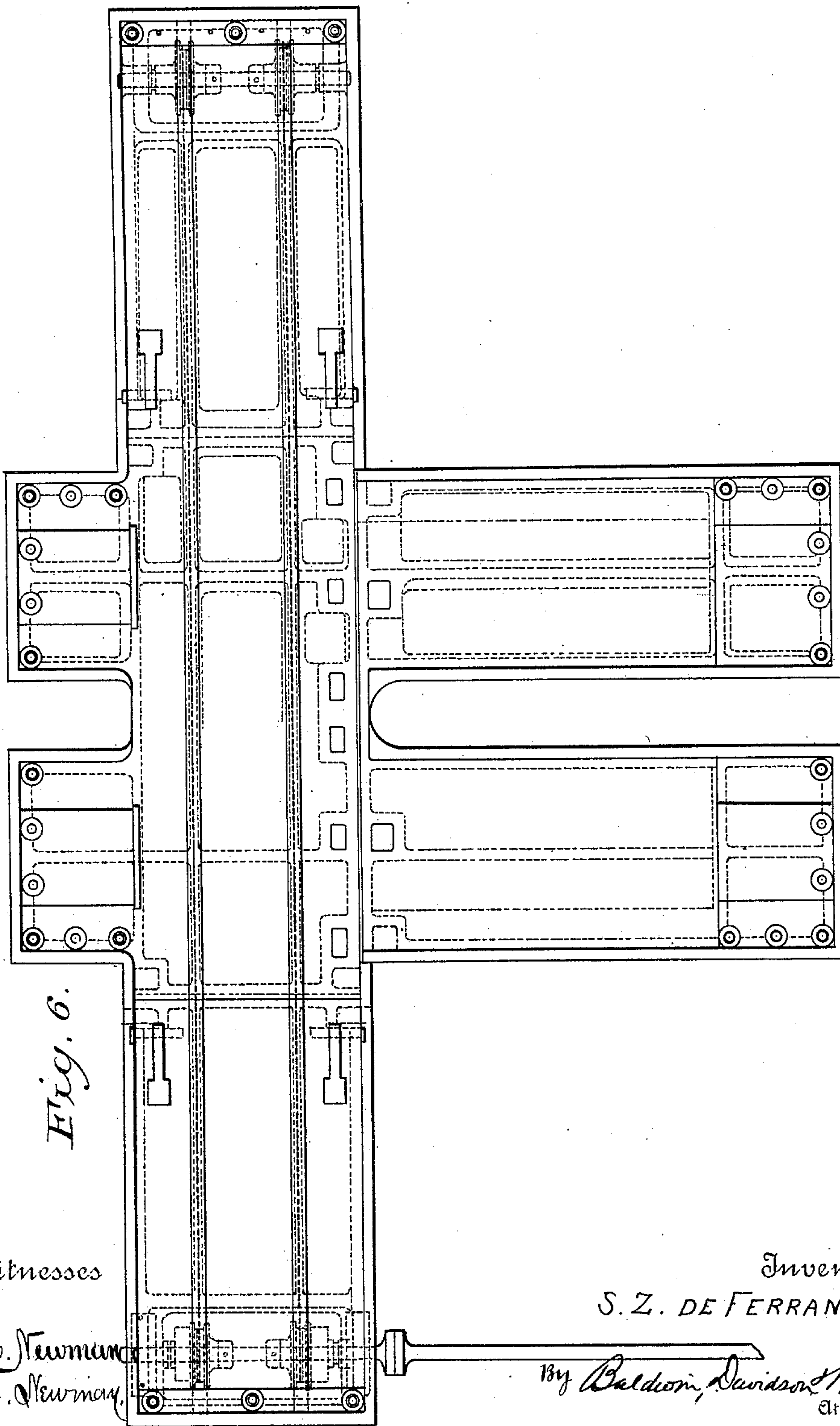
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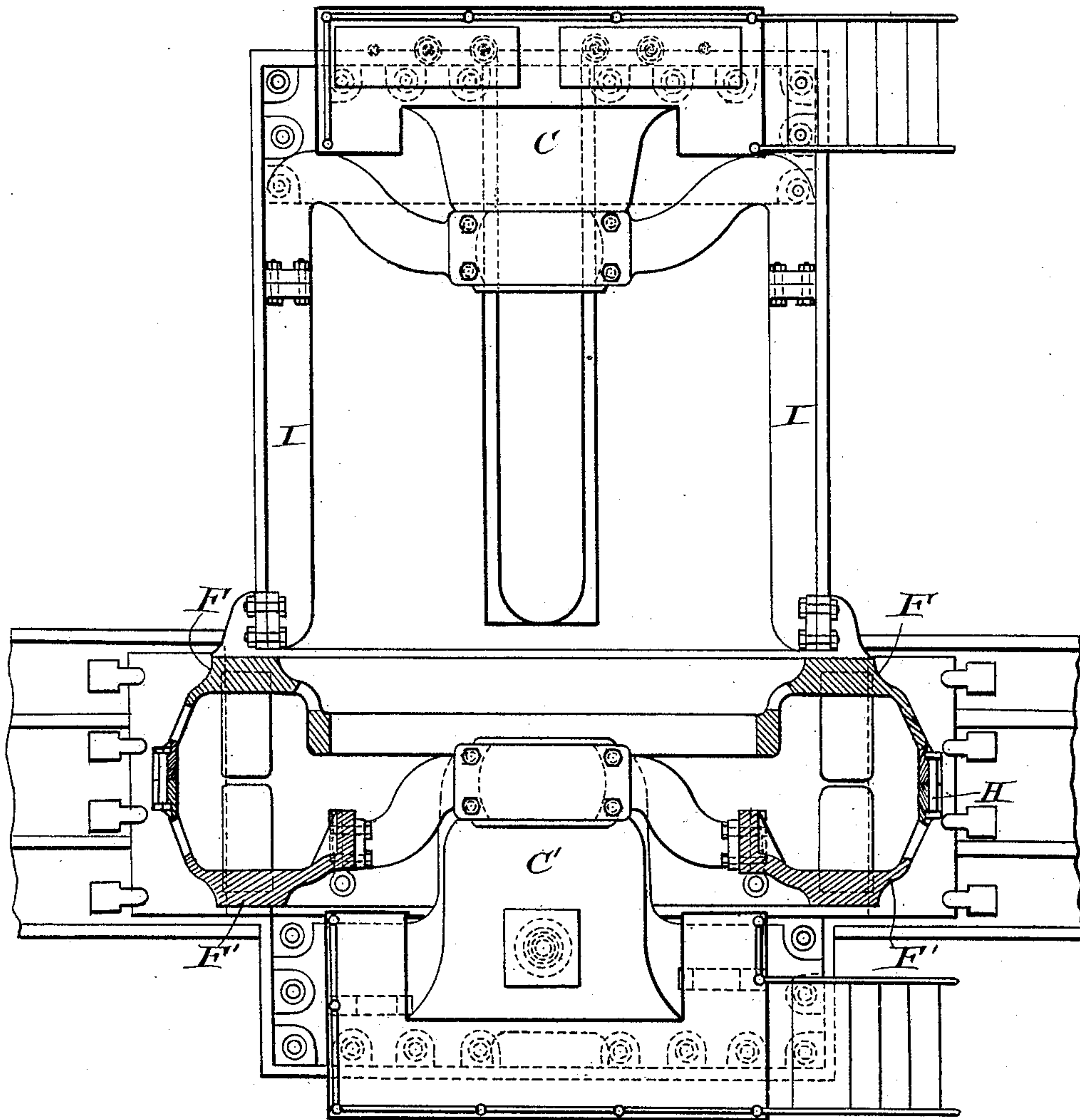
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*Fig. 7.*



Witnesses

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# UNITED STATES PATENT OFFICE.

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ENGLAND.

## DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 408,404, dated August 6, 1889.

Application filed January 14, 1889. Serial No. 296,326. (No model.) Patented in England February 15, 1888, No. 2,316.

*To all whom it may concern:*

Be it known that I, SEBASTIAN ZIANI DE FERRANTI, electrician, a subject of the Queen of Great Britain, residing at 120 Fellowes Road, Hampstead, in the county of Middlesex, England, have invented certain new and useful Improvements in Dynamo-Electrical Machines, (Letters Patent upon this invention have been granted to me in Great Britain, No. 2,316, February 15, 1888,) of which the following is a specification.

The object of my invention is to improve the way in which the armature of a dynamo-electrical machine is carried and driven and to improve the construction of such machines, so that they may be made of large size, with all the fixed parts securely tied together, and yet readily and quickly separable the one from the other. The armature-axis I carry in two bearings at a distance apart from one another, and secure the driving-wheel to the axis between the bearings. The armature I carry by the rim of the wheel. The two standards which carry the bearings for the armature-axis I make to lean inward one toward the other. The field-magnets I carry by two fixed ring-frames on opposite sides of the armature and divide each ring vertically into two halves, which can be readily moved toward or away from one another, as described in an application for patent bearing even date herewith, Serial No. 296,325. The two rings I make somewhat of a U form in cross-section with the hollows inward toward one another and with the several magnet pole-pieces secured to the bottom of the hollows. The two rings at their outer circumference I make to meet one another. The standard carrying the bearing at the armature end of the wheel is formed with arms extending from it to be bolted to the ring which is in front of the armature, and the other ring is connected to the top of the other standard by arms extending past the driving-pulley on its two opposite sides.

The drawings hereunto annexed show a dynamo-electrical machine constructed according to my invention.

Figure 1 is a side elevation mainly in section, and Figs. 2 and 3 are end views of a dynamo-electrical machine constructed ac-

cording to my invention. Fig. 4 is a vertical section, and Fig. 5 a horizontal section, of the frame that carries the fixed magnets; and Fig. 6 a plan of the bed-plate of the machine. Fig. 7 is a plan, partly in section, of the whole frame of the machine; and Fig. 8, an end view of the collector at the armature end of the axle.

A is the armature-axle, mounted in bearings B, carried by standards C C', which form part of the fixed frame of the machine.

D is the driving-wheel fixed upon the axle between the bearings.

E is the armature carried by the rim of the driving-wheel. The armature is shown to be constructed in the manner described in an application for patent filed November 30, 1888, Serial No. 292,259; but the armature might be of what is known as the "multiple Gramme type;" or it might be of any other suitable construction.

F F' are the two ring-frames which carry the field-magnets. They are each divided vertically into two parts, which can be slid toward or away from one another, as described in my aforesaid application, Serial No. 296,325. The rings are, as shown, each made somewhat of a U form in cross-section, and the magnet pole-pieces G are secured to the bottom of the hollow. The rings outside the magnets meet together, and are bolted one to the other by bolts H, and are also bolted to the bed by bolts H'. The standard C' is, as shown, formed with arms extending from it, which are bolted to the ring F', and the standard C is similarly formed with arms extending from it, which by side pieces I are attached to opposite sides of the ring F. The driving-wheel is formed with two naves or hubs at a distance apart from one another. Between them is a loose collar J, which screws onto a screw-thread on the axle.

By turning the collar in one or other direction the wheel, with the armature, can be moved endwise along the axle, and the position of the armature between the field-magnets can in this way be easily adjusted. The screw-collar is slit across one part of its circumference, and when the armature has been set in proper position the ends of the split collar can be drawn together by bolts and the



collar made to clamp the axle tightly, so that it cannot be turned around it.

The collector for conveying current from the armature is, as described in another application for patent before alluded to, situated just in front of the front end of the armature-axle, and is constructed in a somewhat similar manner to that described in that application; but in place of the two conductors from the armature being led to two sets of collector-rings, as therein described, it is shown to have one of the conductors only led to collector-rings  $K'$ , the other conductor being in electrical connection with the framing of the machine.

$K^2$  is the conductor so led from the armature to the rings  $K'$ . The current is led from the rings by rubbers  $K^3$ , as shown in Figs. 7 and 8, and as is fully described in the application above mentioned. The collector is also, as therein described, inclosed within an iron box, which cannot be opened when the machine is running and producing current. The drawings show the bearings of the armature-axle as being lubricated by oil supplied to them through pipes  $L$  from a pump  $M$ . The pump is driven by a crank or an eccentric on a toothed wheel  $N$ , which is itself driven by a pinion  $O$  on the end of the armature-axle. The oil passes back from the ends of the bearings by pipes (not shown in the drawings) to a receptacle  $P$ , wherein it is allowed to settle, and from which clear oil is drawn away through the pump suction-pipe.

In applications Serial No. 292,259, filed November 30, 1888, and Serial No. 296,325, filed January 14, 1889, I have shown machines similar in some respects to that herein disclosed, and any subject-matter herein shown but not claimed will be claimed in said cases.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A dynamo-electric machine having a driving-pulley carried between two bearings in which the wheel-shaft is supported, and an armature carried by the rim of said pulley at one side of its driving-surface, substantially as set forth.

2. In a dynamo-electric machine, the combination, with the driving-pulley having a surface for the driving-belt, of the armature carried by the rim of the pulley at one side of said surface and projecting outwardly radially from the rim of the pulley.

3. In a dynamo-electric machine, the combination of an armature carried by the rim of a driving-wheel, two standards, one on either side of the driving-wheel, leaning one toward the other and carrying the bearings for the wheel-shaft, frames carrying the fixed field-magnets at the sides of the armature, and connecting-pieces tying the magnet-frames to the standards.

4. In a dynamo-electric machine, the combination of a revolving armature, a circle of field-magnet pole-pieces of alternate polarity on either side of it, an annular frame somewhat of a  $U$  shape in cross-section carrying the circle of pole-pieces on each side of the armature, and bolts or other connections securing the outside circumference of the two frames together.

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