

No. 664,320.

C. W. HOFFMANN.  
ROTARY ENGINE.

Patented Dec. 18, 1900.

(Application filed Dec. 22, 1898.)

(No Model.)

Fig. 1. 2 Sheets—Sheet 1.

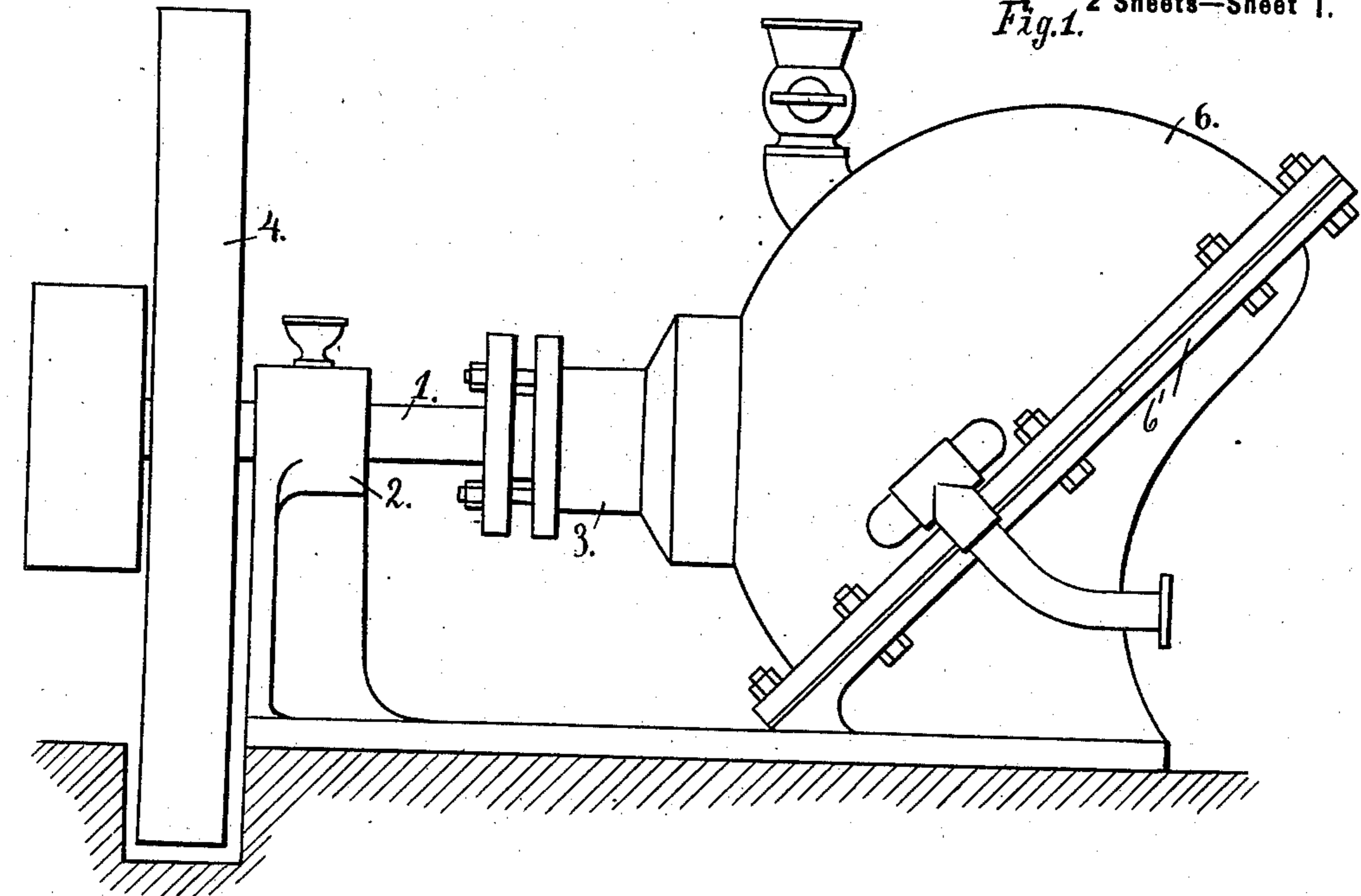
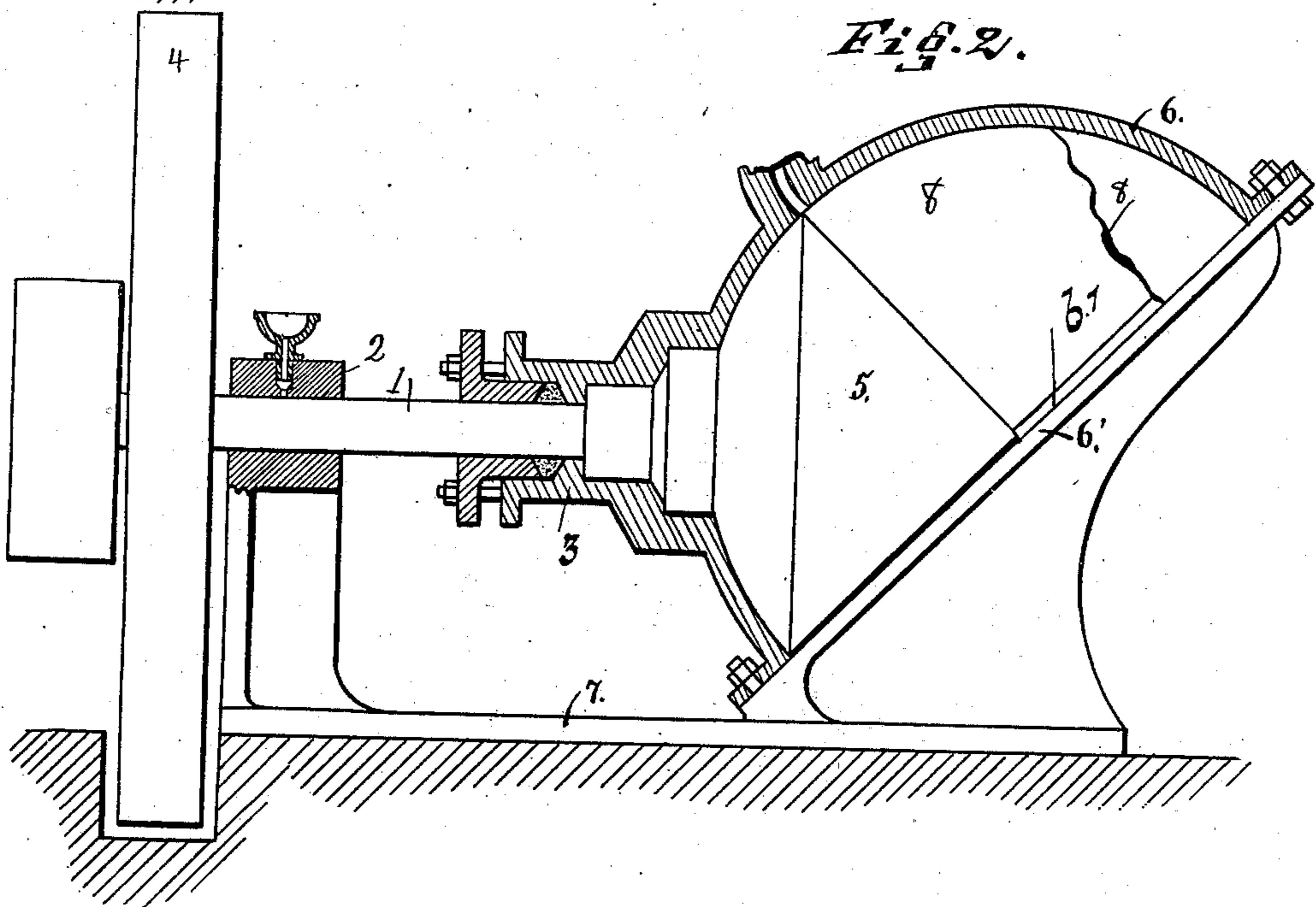


Fig. 2.



Witnesses:  
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J. L. Lippman

INVENTOR:  
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att'y.

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Fig. 4.

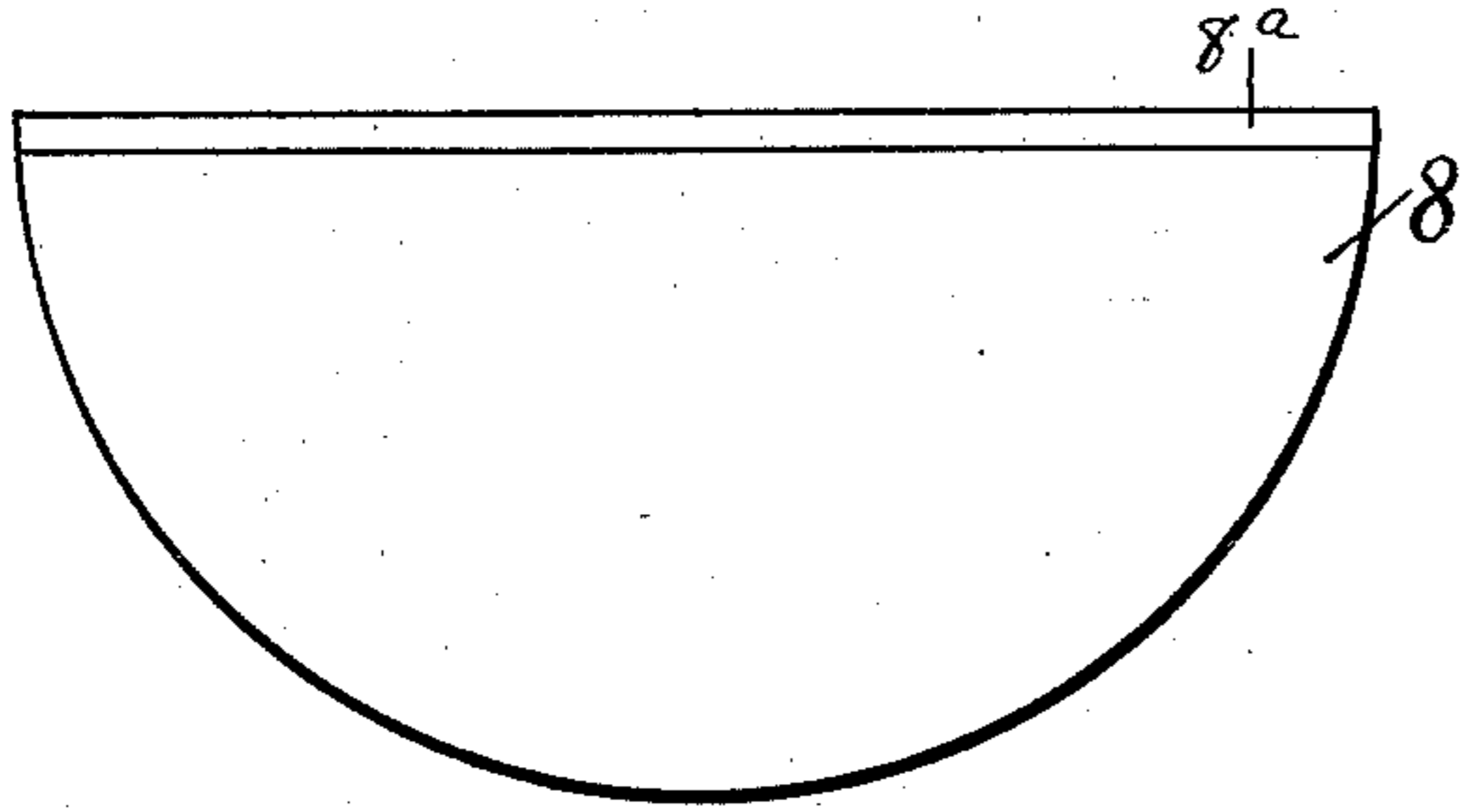


Fig. 5.

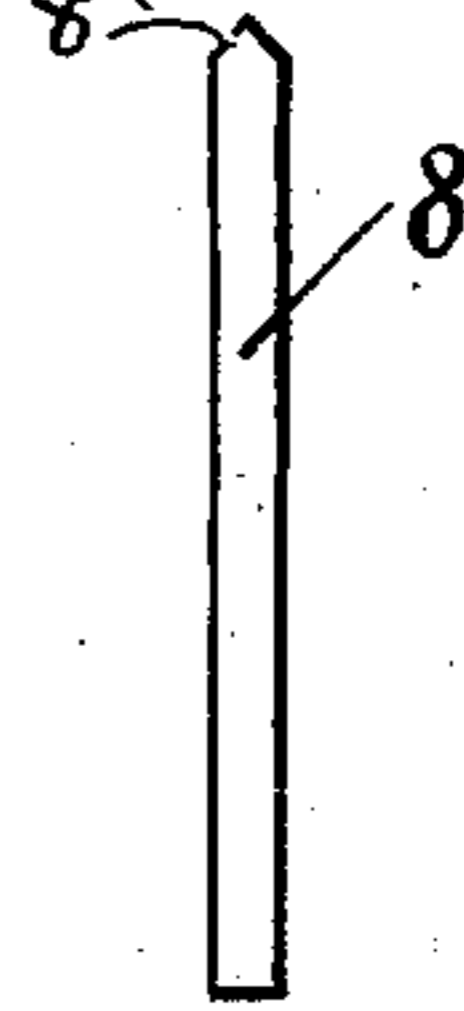
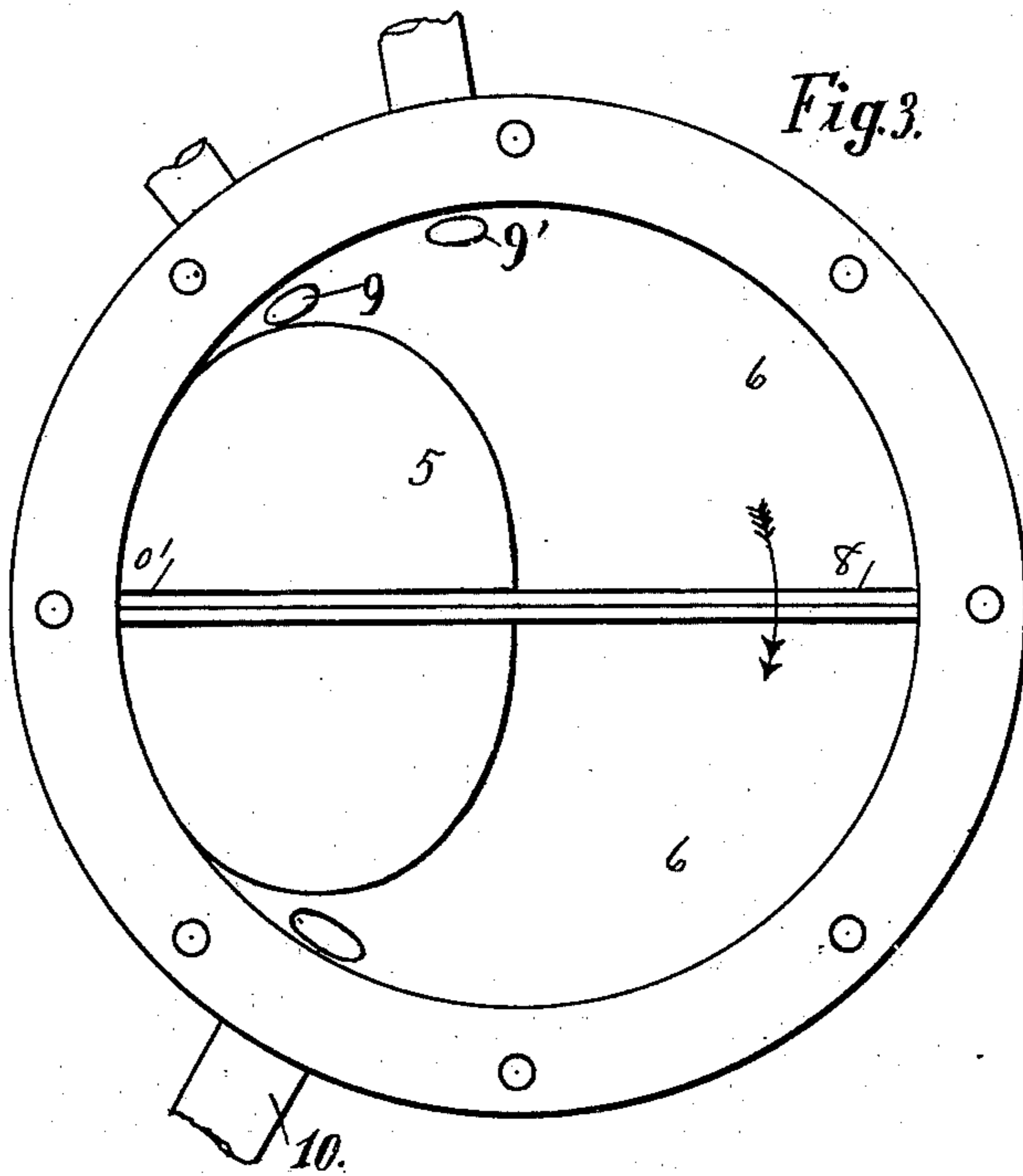


Fig. 3.



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# UNITED STATES PATENT OFFICE.

CHRISTIAN WILHELM HOFFMANN, OF AMSTERDAM, NETHERLANDS.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 664,320, dated December 18, 1900.

Application filed December 22, 1898. Serial No. 700,057. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN WILHELM HOFFMANN, technician, a subject of the Queen of the Netherlands, residing at 1 Nieuwe Willemstrasse, Amsterdam, Netherlands, have invented certain new and useful Improvements in Rotary Engines, of which the following is a full, clear, and exact description.

This invention relates to rotary engines.

In order that this invention may be the better understood, I now proceed to describe the same, reference being had to the accompanying drawings and to the figures marked thereon.

Like figures refer to like parts in the drawings.

Figure 1 is a side elevation of the engine. Fig. 2 is a similar view partly in section. Fig. 3 is a view within the cylinder. Fig. 4 is a view of the piston, which is in the form of a semicircular plate; and Fig. 5 is an end view of the piston.

A fly-wheel 4 and a pulley are attached in the usual manner to the shaft 1 of the engine, which is supported on the one side in the bearing 2 and on the other side in the bearing 3 of a hemispherical chamber. The bearing 3 is formed as a stuffing-box, and the end of the shaft carries a cone 5, the apex of which is in direct line with the longitudinal center of the shaft and the side at an angle of forty-five degrees to said line. The circular base 6' of the hemispherical chamber 6 is set at an angle of forty-five degrees to the engine-base 7. The cone 5 has an opening through its sides vertically to its base into which is exactly ground the piston 8. (Shown in side and end elevation, Figs. 4 and 5.) This piston 8, which has the form of a plate, is semicircular, so that its curved edge corresponds to the form of the hemispherical chamber 6, and the straight edge, which is toward the middle of the base, is beveled, as at 8<sup>a</sup>, because the piston is forced to make an oscillating motion at the rotation of the cone in the hemispherical chamber and has to adapt itself in all positions to the form of said chamber. For instance, its lower side passes from the position shown in Fig. 2, in which the piston stands vertical and in which its lower side is entirely situated within the cone 5, gradually out of the cone, while the other side disappears therein until the piston protrudes equally from both sides of the cone in a position which is perpendicular to that

shown in Fig. 2. When the rotation is continued, the first free side disappears in the cone and the operation described is repeated. Simultaneously the piston makes an oscillating movement relatively to the inner face *b'* of the base, the necessity for which movement will be self-apparent. The openings for the motive power are situated at 9 and 9'.

The operation of the engine on the admission of the motive power through the orifices 9 and 9' will be apparent. In the position shown in Fig. 3 the piston is driven around in the direction indicated by a double arrow. The piston 8 thus moves toward the exit 10. When the part *o'* of the piston is situated between the two admission-orifices, the power entering through the orifice 9 causes a fresh revolution, the previous charge escaping through 10. At the continuation of the rotation both admission-orifices act and the operation is repeated.

It will be seen that the area of the two entrance-openings 9 9' is equal to that of the exit 10, and that the opening 9 being in advance of the opening 9' steam entering the former catches the piston first and gives it a primary impulse without subjecting it to the full shock incident to the full admission of the steam under pressure through a single opening equal in area to both of said openings.

The details of the construction of the machine—for instance, the attachment of the chamber to the base or to the frame, the construction of the stuffing-box-lubricating device, &c.—are without influence on the character of the invention and the choice of the materials rests entirely with the design of the details.

What I claim, and desire to secure by Letters Patent, is—

In an engine a cone 5, coupled with a shaft 1, a hemispherical chamber 6, having a suitable base, a semicircular piston beveled on its straight edge rotatably fitted in said chamber and situated in a slot through the cone, perpendicularly to its base, two power-admission orifices through the chamber and an exhaust-orifice in the same.

In witness whereof I subscribe my signature in presence of two witnesses.

CHRISTIAN WILHELM HOFFMANN.

Witnesses:

ABRAHAM JOHANNES LAMBERTUS HAVERKAMP,  
AUGUST SIEGFRIED DOCA.