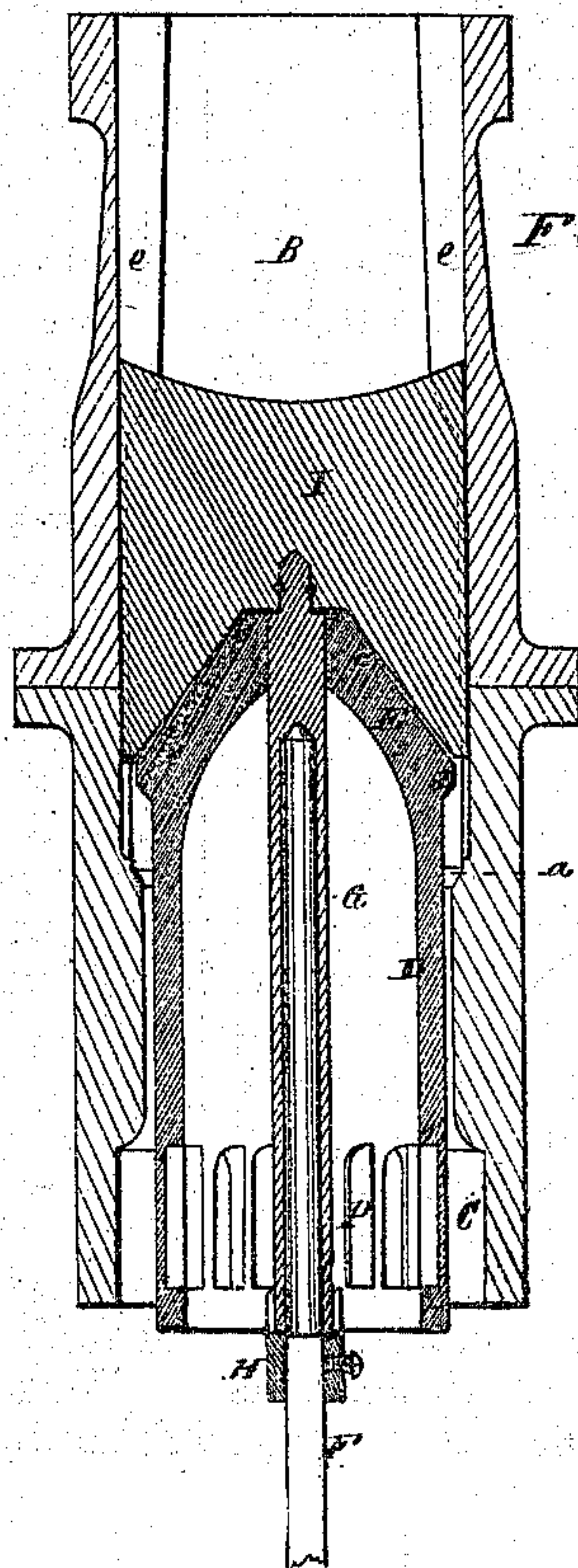
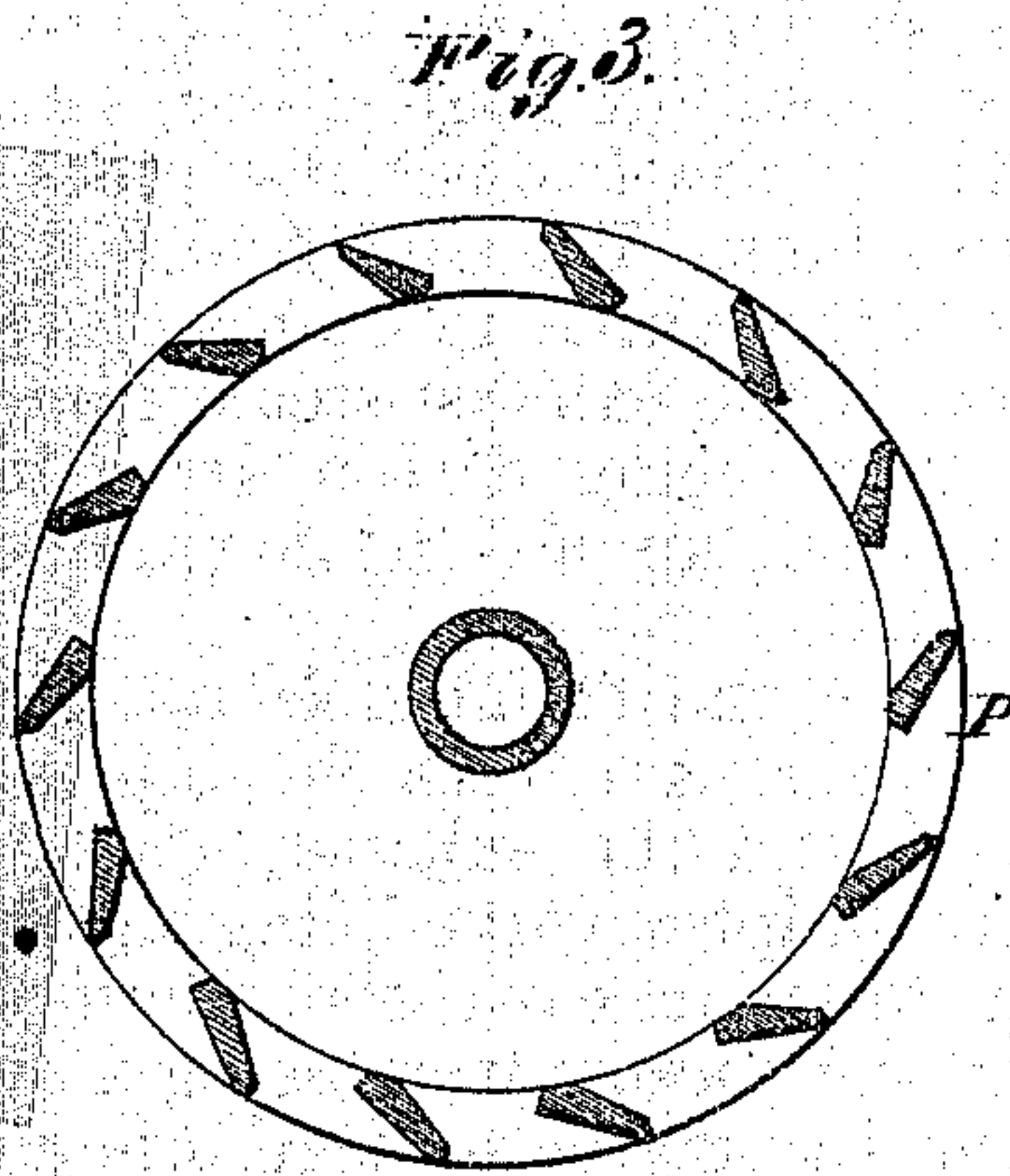
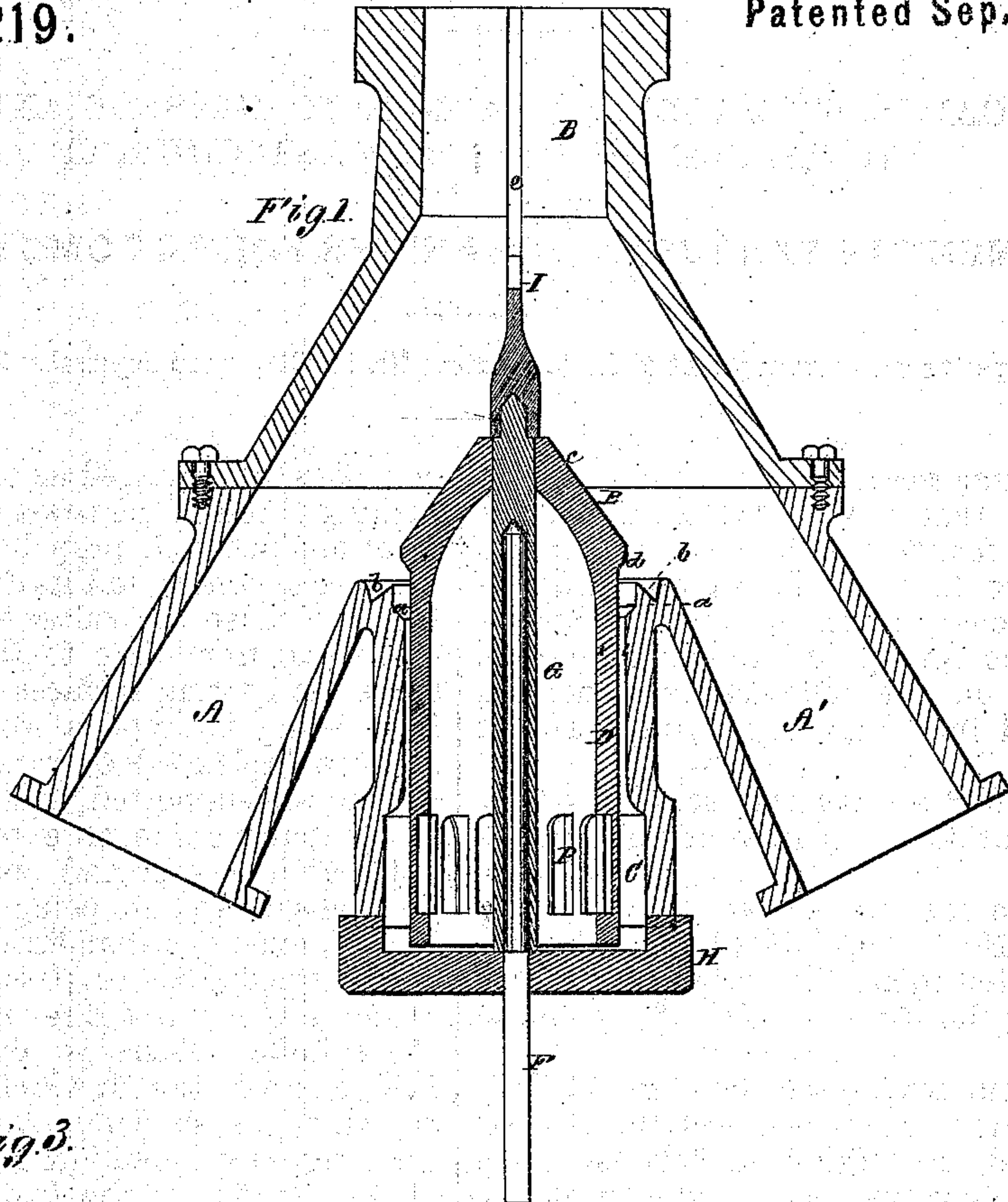


WILLIAM A. CARNS.

Improvement in Exhaust Mechanism for Locomotive Engines.

No. 119,219.

Patented Sep. 26, 1871.



Witnesses.

S. N. Piper.

L. N. Möller

W. A. Carns

by his attorney.

R. H. Eady

UNITED STATES PATENT OFFICE.

WILLIAM A. CARNS, OF MALDEN, ASSIGNOR TO HIMSELF AND HENRY ELMER TOWNSEND, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN EXHAUST MECHANISMS FOR LOCOMOTIVE-ENGINES.

Specification forming part of Letters Patent No. 119,219, dated September 26, 1871.

To all whom it may concern:

Be it known that I, WILLIAM A. CARNS, of Malden, of the county of Middlesex and State of Massachusetts, have invented a new and useful Exhaust Mechanism for Locomotive Steam-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawing, of which—

Figures 1 and 2 are vertical sections of my said mechanism taken in planes at right angles to each other.

This invention has reference to that for which Letters Patent No. 110,008, dated December 13, 1870, were granted to me, the main object of this invention being the same as that of the one so patented.

In carrying out my present invention I have adopted a different arrangement of the two exhaust-pipes, and have disposed between them and below the air-valve seat a cylindrical passage or air-induct to receive a cylinder connecting the said valve and the fan-wheel or propeller used for revolving the valve. I have also combined with such parts what I term a bridge to slide up and down with the nozzle-valve and to prevent the exhaust from one pipe or passage from being driven into the other; and, furthermore, I have also arranged and combined with the parts as mentioned a spark and condensed-water-intercepting groove, all being substantially as hereinafter described and as represented in the said drawing.

In such drawing, A and A' are the two exhaust-pipes, which are to be supposed to lead from the two engine-cylinders of the locomotive. These pipes open into or branch from a common educt, B, as shown. Between the two pipes A A' there is the air-induct or cylindrical passage, C, whose top terminates in or is formed with a valve-seat, *a*, which is circumscribed by a groove, *b*, arranged as represented. This groove is the spark and condensed-water-intercepting groove, as hereinbefore mentioned. Within the passage C is a hollow cylinder, D, which is capped by a duplex valve, E, the upper part *c* of which is a conic frustum or valve for closing the educt B. The lower part *d* is a valve to rest on and fit to the seat *a*. At the bottom of the cylinder D is the propeller P or fan-wheel, or series of wings

or blades, so arranged as to cause the air, while rushing through the passage C and by impingement against such propeller, to more or less revolve the cylinder and its duplex valve, the same being to cause the valve to change its position on its seat from time to time, and thereby preserve the bearing surfaces of the valve and seat from being improperly worn. The cylinder D and the duplex valve, arranged and combined as shown, are supported on a stationary spindle, F, by a tubular guide, G, extended down from the valve at its center and encompassing the spindle, the said spindle being supported by a cross-bar, H, extended diametrically across the lower end of the induct or passage C. The cylinder D and duplex valve E revolve together freely on the spindle. There is pivoted to the valve a bridge or partition, I, which is opened and spans the valve, as shown, and has its opposite vertical edges extended into guide-grooves *ee*, made at the junction of the two exhaust-pipes and in their common educt. The said bridge I, by extending above the valve in manner as shown, serves to prevent the exhaust-steam from either pipe A or A' from being driven down into the other, and directs it up into the common escape-nozzle or educt B.

The purpose of the cylinder D and the eduction-passage C, arranged with the duplex valve, the propeller P, and the exhaust-pipes A A' B, is to insure the duplex valve being raised to its upper seat in order to close the exhaust-nozzle to prevent air and cinders from being drawn into such when the air may be passing into either of the pipes A A' through the passage C and propeller P. The purpose of the groove *b* is to intercept any sparks or condensed steam from the pipe B when the duplex valve is drawn in its lower position or upon its lower seat, and prevent such from passing back into the pipes A A'. Such water or sparks will be removed from the groove or carried off through the pipe B by the steam, when it may next exhaust or be driven upward through either of the pipes A A'.

I herein make no claim to any thing, combination, or arrangement as shown in my said patent as hereinbefore mentioned, when considered separately from the additions hereinbefore specified.

What I claim as my present invention is as follows, viz.:

1. The combination and arrangement of the cylinder D and its air-induction passage C with the propeller P, the duplex valve E, and the exhaust-steam passages A A' B, arranged as set forth, the said valve being provided with seats disposed with the air-induct or passage C and the exhaust-steam pipes or passages A A' B, in manner as explained.

2. The combination and arrangement of the bridge or partition I and the groove *b*, or either, with the parts, as above claimed.

WILLIAM A. CARNS.

Witnesses:

R. H. EDDY,
S. N. PIPER.