

Dec. 19, 1939.

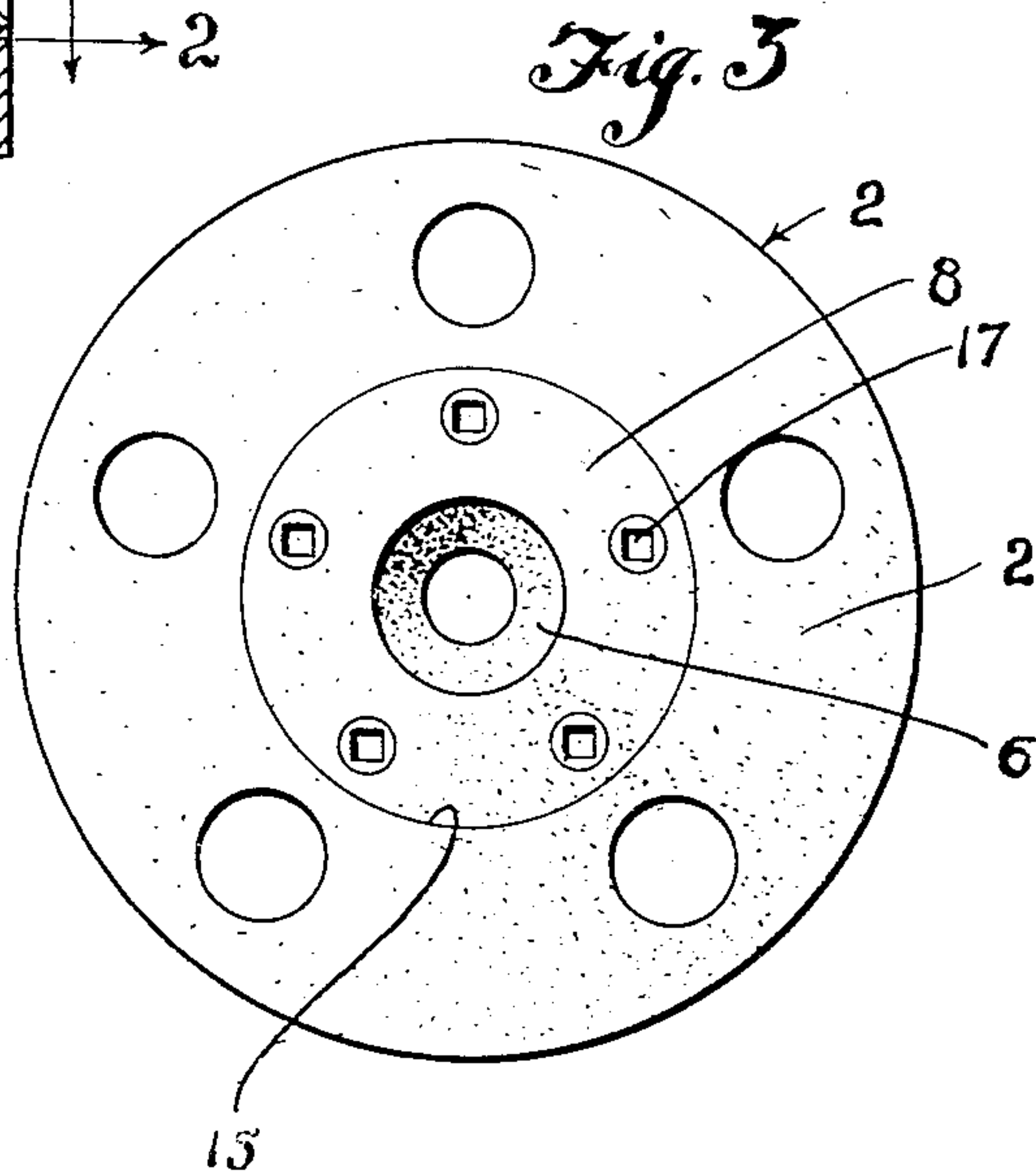
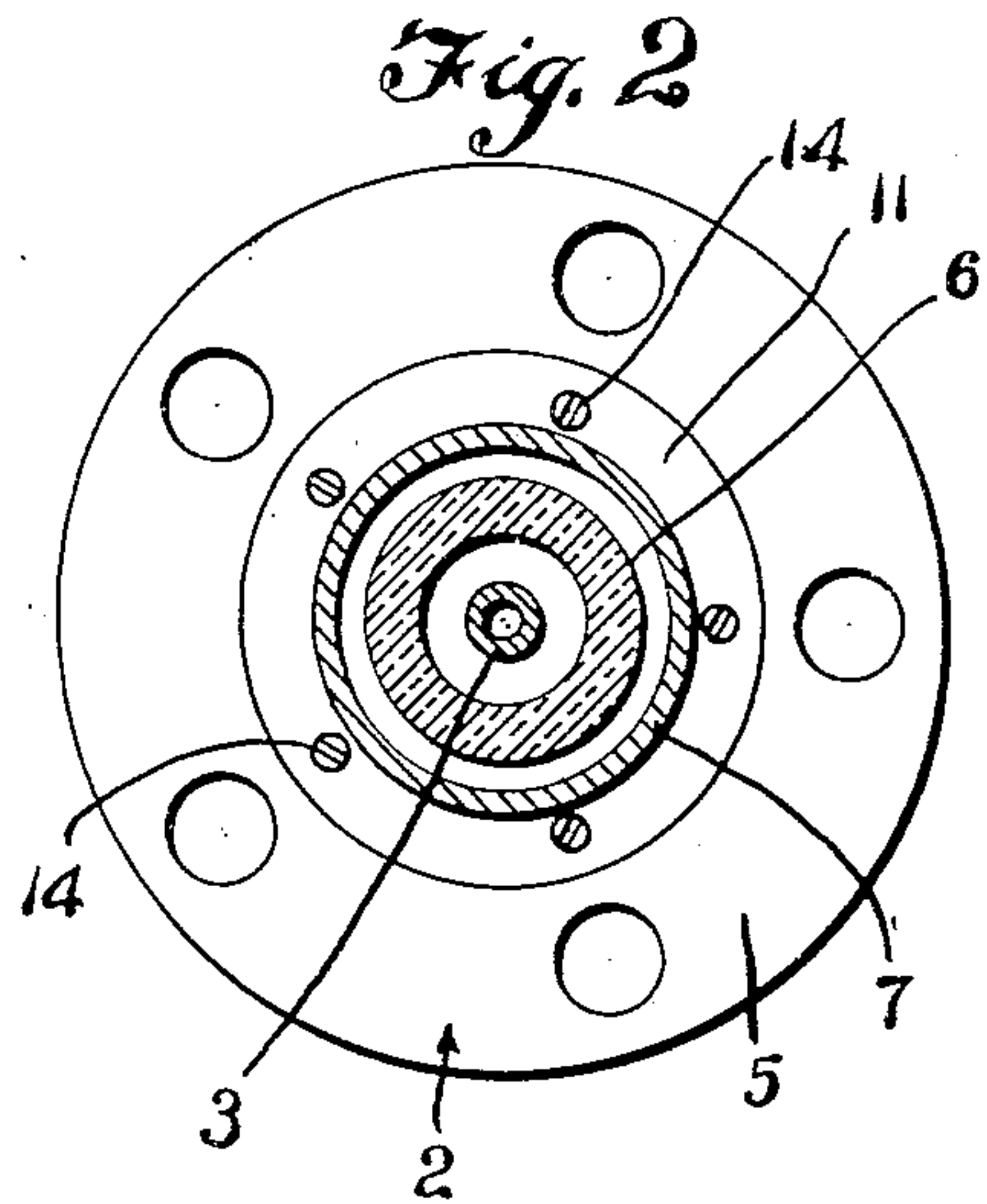
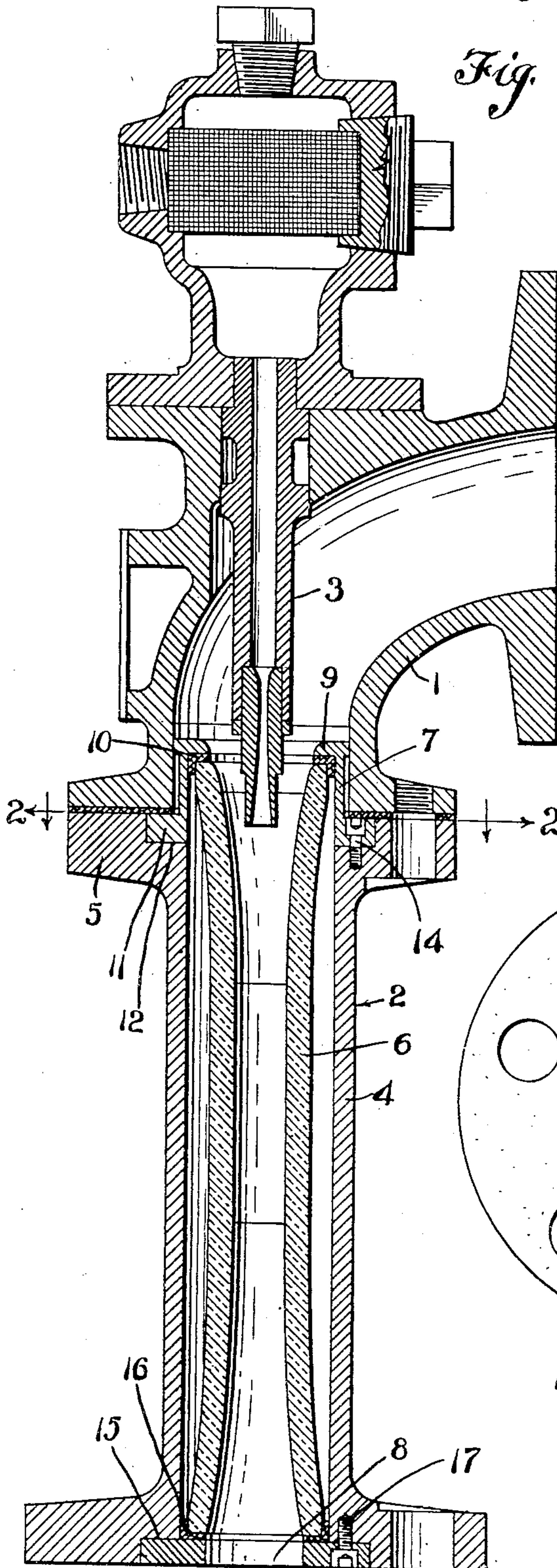
E. G. ROSS

2,183,623

STEAM EJECTOR

Filed Aug. 20, 1938

2 Sheets-Sheet 1



ELMER G. ROSS  
INVENTOR

BY

*Robert M. Ross*

ATTORNEY

Dec. 19, 1939.

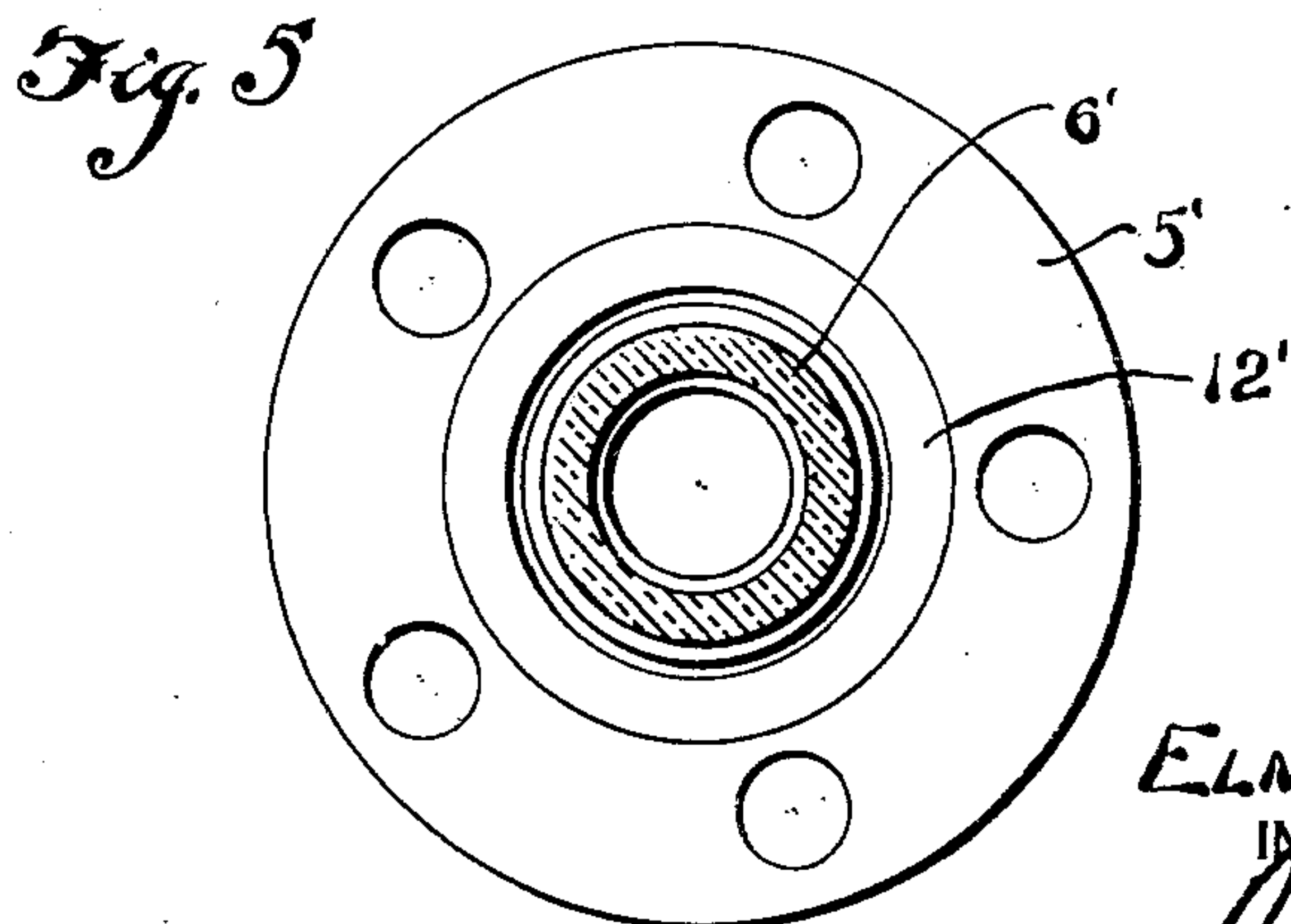
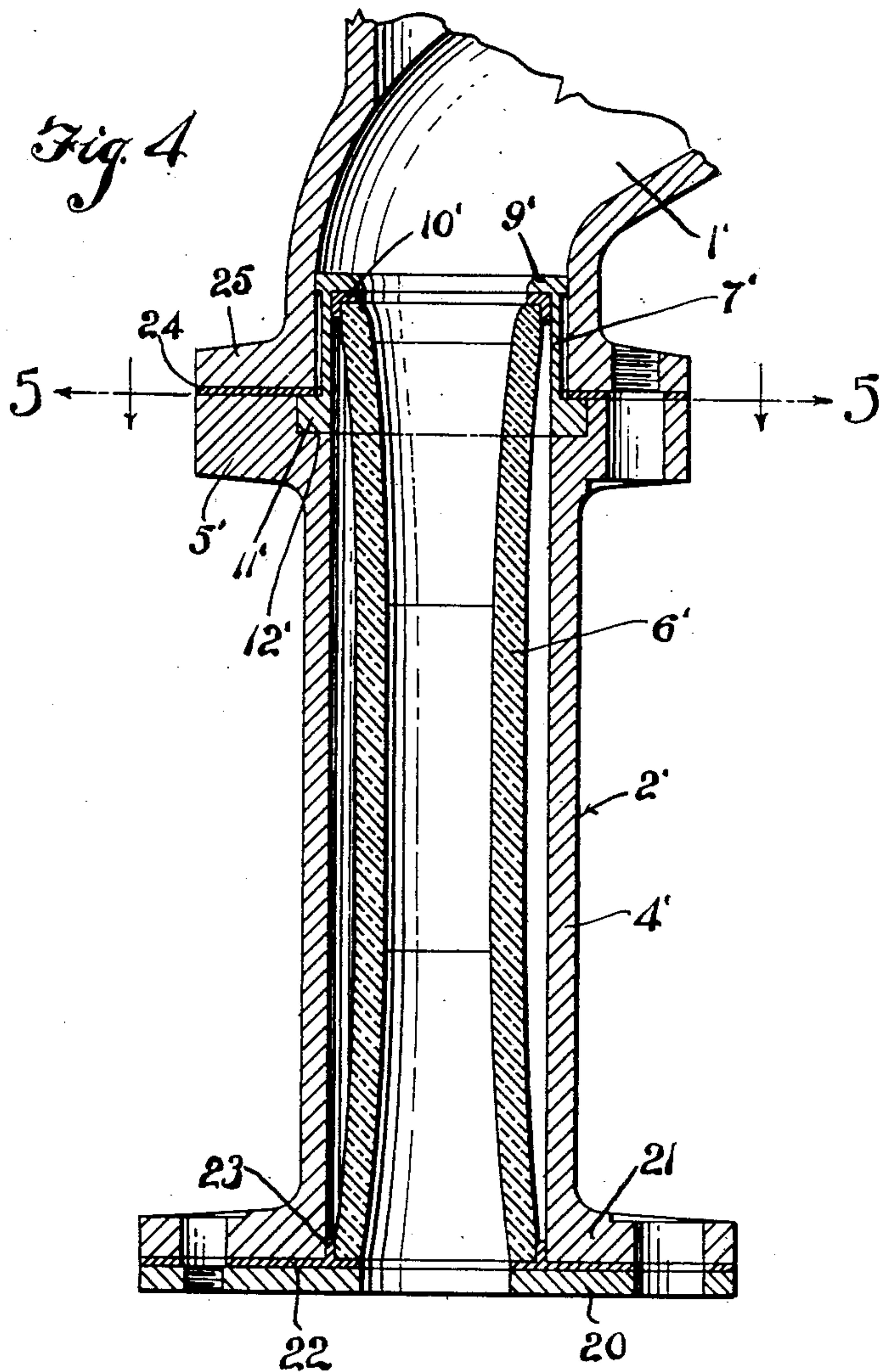
E. G. ROSS

2,183,623

STEAM EJECTOR

Filed Aug. 20, 1938

2 Sheets-Sheet 2



ELMER G. ROSS  
INVENTOR

BY *Robert Meyer*

ATTORNEY



## UNITED STATES PATENT OFFICE

2,183,623

## STEAM EJECTOR

Elmer G. Ross, Bloomfield, N. J., assignor to  
Worthington Pump and Machinery Corpora-  
tion, Harrison, N. J., a corporation of Dela-  
ware

Application August 20, 1938, Serial No. 225,878

4 Claims. (Cl. 230—95)

This invention relates to steam ejectors or steam jet exhausters, and an object of the present invention is to provide a steam jet exhauster which will withstand the erosive action of wet steam and the corrosive action of acid and other chemical vapors and fluids.

Another object of the invention is to provide an ejector or steam jet exhauster having a diffuser of vitreous material such as glass or the like, and to provide a novel structure for mounting the vitreous diffuser in its carrying body or shell so as to permit the diffuser to be readily assembled or disassembled and connected to the nozzle carrying head of the ejector as a complete unit.

Another object of the invention is to provide in a steam jet exhauster as specified a structure which will compensate for the difference in the coefficient of heat expansion of the vitreous diffuser and its metal shell.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a steam ejector embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a longitudinal section through the improved steam ejector.

Figure 2 is a cross-section taken on the line 2—2 of Figure 1.

Figure 3 is an end view of the discharge end of the ejector.

Figure 4 is a longitudinal section of a modified form of the diffuser structure.

Figure 5 is a cross-section on the line 5—5 of Figure 4.

Referring more particularly to the drawings, the improved steam ejector or steam jet exhauster comprises the inlet head 1, which discharges into the diffuser 2, and through which the nozzle 3 projects. The nozzle 3 discharges into the diffuser 2 at the inlet thereof as is usual in the construction of steam ejectors or exhausters.

The present invention relates wholly to the diffuser structure, and it includes a metal shell 4 which has an annular flange 5 on its inlet end for attachment to the outlet end of the head 1. A vitreous diffuser 6 is positioned within the shell 4 and forms the diffuser passage of the ejector or exhauster. The glass diffuser 6 is

securely held in place within the shell 4 by means of a holding sleeve 7 at its inlet end and a holding plate 8 at its discharge end. The holding sleeve 7 is provided with an inturned flange 9 which engages a gasket 10 placed over the inlet end of the vitreous diffuser 6. The sleeve 7 has an out-turned annular flange 11 formed thereon which rests in a recess 12 in the face of the flange 5. The flange 11 is attached to the flange 5 by cap screws 14, so that the tightening of the cap screws 14 in place will urge the inturned flange 9 towards the end of the diffuser 6.

The outlet end of the shell 4 has a recess 15 cut therein which receives the holding plate 8. A gasket 16 engages the holding plate 8 and the discharge end of the diffuser 6, so that when the plate 8 is securely attached to the shell 4 by means of the cap screws 17 the diffuser 6 will be tightly clamped in position in the shell 4 forming a complete unitary diffuser structure which is attached to the head 1 by means of suitable bolts (not shown).

The gaskets 10 and 16 are of yieldable material and of sufficient thickness to compensate for the difference in the coefficient of heat expansion of the vitreous diffuser 6 and the metal shell 4.

In Figures 4 and 5 of the drawings a modified form of the diffuser structure is shown which differs only slightly from the preferred form illustrated in Figure 1. In this modified construction the diffuser structure 2' includes the metal shell 4' having the flange 5' at its inlet end, which flange serves as means of attachment of the diffuser to the head 1'. The vitreous diffuser 6' has its inlet end engaged by a holding sleeve 7'. The holding sleeve 7' has an inturned annular flange 9' which engages the gasket 10' over the inlet end of the diffuser 6'. The flange 11' of the holding sleeve 7' fits in a recess 12' in the face of the flange 5'. However, it is not attached to the shell 4' by means of cap screws or the like, as is the sleeve 7 in Figures 1 to 3.

A holding plate 20 is provided, which is attached to the annular attaching flange 21 on the outlet end of the shell 4'. The plate 20 is of the same diameter as the flange 21, and a gasket 22 is placed between the holding plate 20 and the flange 21, and it has an inturned annular portion 23 which engages about the outer surface of the diffuser 6' at its outlet end. When the holding plate 20 is securely clamped in place or securely connected to the flange 21, it forces the inlet end of the diffuser 6' firmly against the gasket 10' and the inturned flange 9'. Such



forcing action also forces the flange 11' securely against the gasket 24 and the attaching flange 25 of the head 1', thus securely holding the vitreous diffuser 6' in its proper position in the shell 4' and providing a complete unitary diffuser structure which may be attached to or detached from the head 1' as a unit.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In a steam jet exhaustor, a metal diffuser shell, a head, a vitreous diffuser in said shell and being entirely free from any direct contact with the shell, and clamping means carried by said shell and engaging said diffuser for holding it in place in the shell.

2. In a steam jet exhaustor, a metal diffuser shell, a head, a vitreous diffuser in said shell and being entirely free from any direct connection with the shell, clamping rings carried by said shell and engaging said diffuser for holding it in place in the shell, and yieldable gaskets between said diffuser and said clamping rings whereby said diffuser will be yieldably held from direct contact with any metal parts of the exhaustor.

3. In a steam jet exhaustor, a metal diffuser shell, a head, a vitreous diffuser in said shell and being entirely free from any direct connection with the shell, a clamping ring having an out-turned flange detachably connected to the shell and an inturned flange engaging the inlet end of said vitreous diffuser, and a clamping plate detachably carried by said shell and engaging the outlet end of the vitreous diffuser whereby said diffuser will be held in place within said shell by said clamping rings without contact with the shell.

4. In a steam jet exhaustor, a metal diffuser shell, a head, a vitreous diffuser in said shell and projecting upwardly into said head, said shell provided with an annular groove at its end connected to said head, a holding sleeve at the inlet end of the vitreous diffuser and having an out-turned flange engaging in the groove in said shell, said holding sleeve having an inturned flange at its end remote from said out-turned flange and a yieldable gasket between said in-turned flange and the inlet end of said vitreous diffuser for yieldably holding the diffuser in place, and means attached to said shell and engaging the outlet end of the vitreous diffuser.

ELMER G. ROSS.