

No. 887,798.

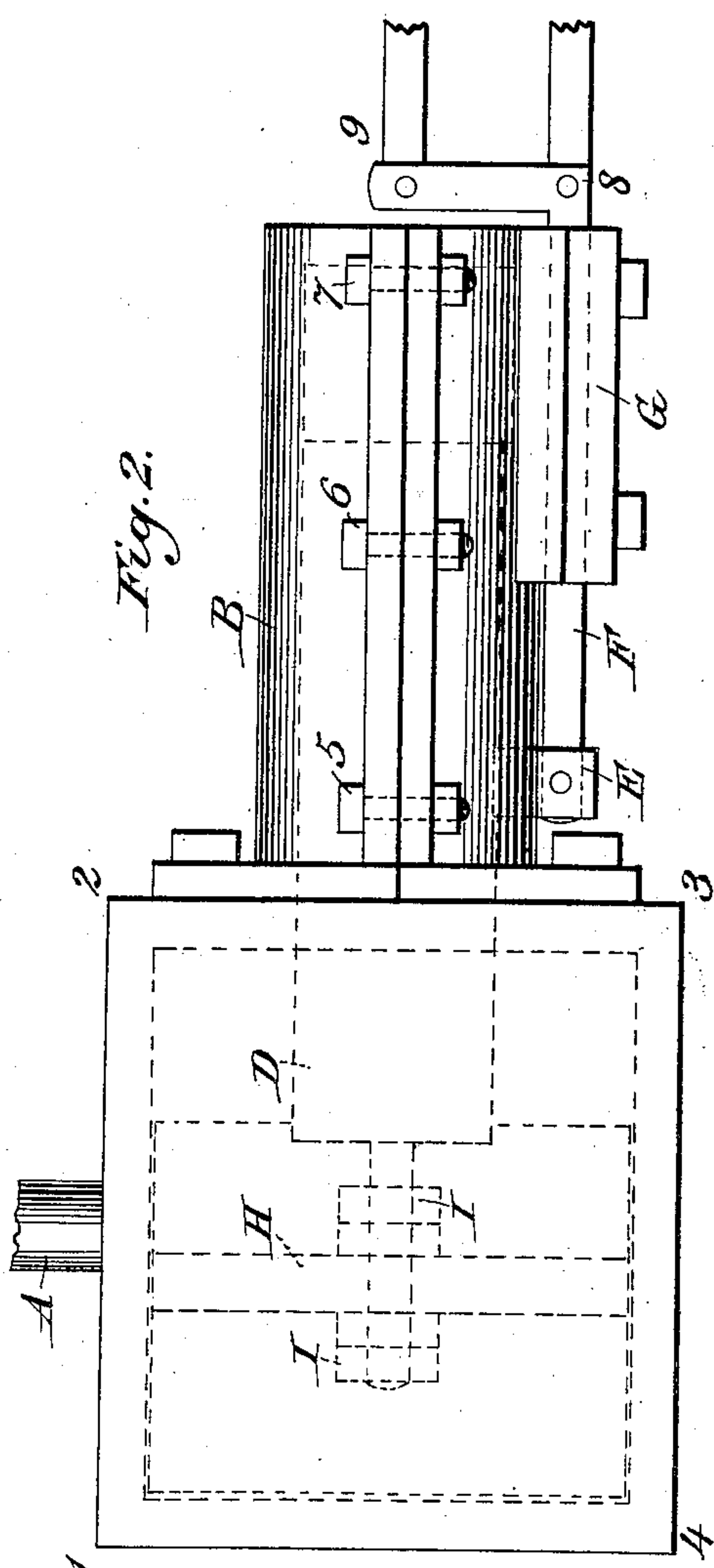
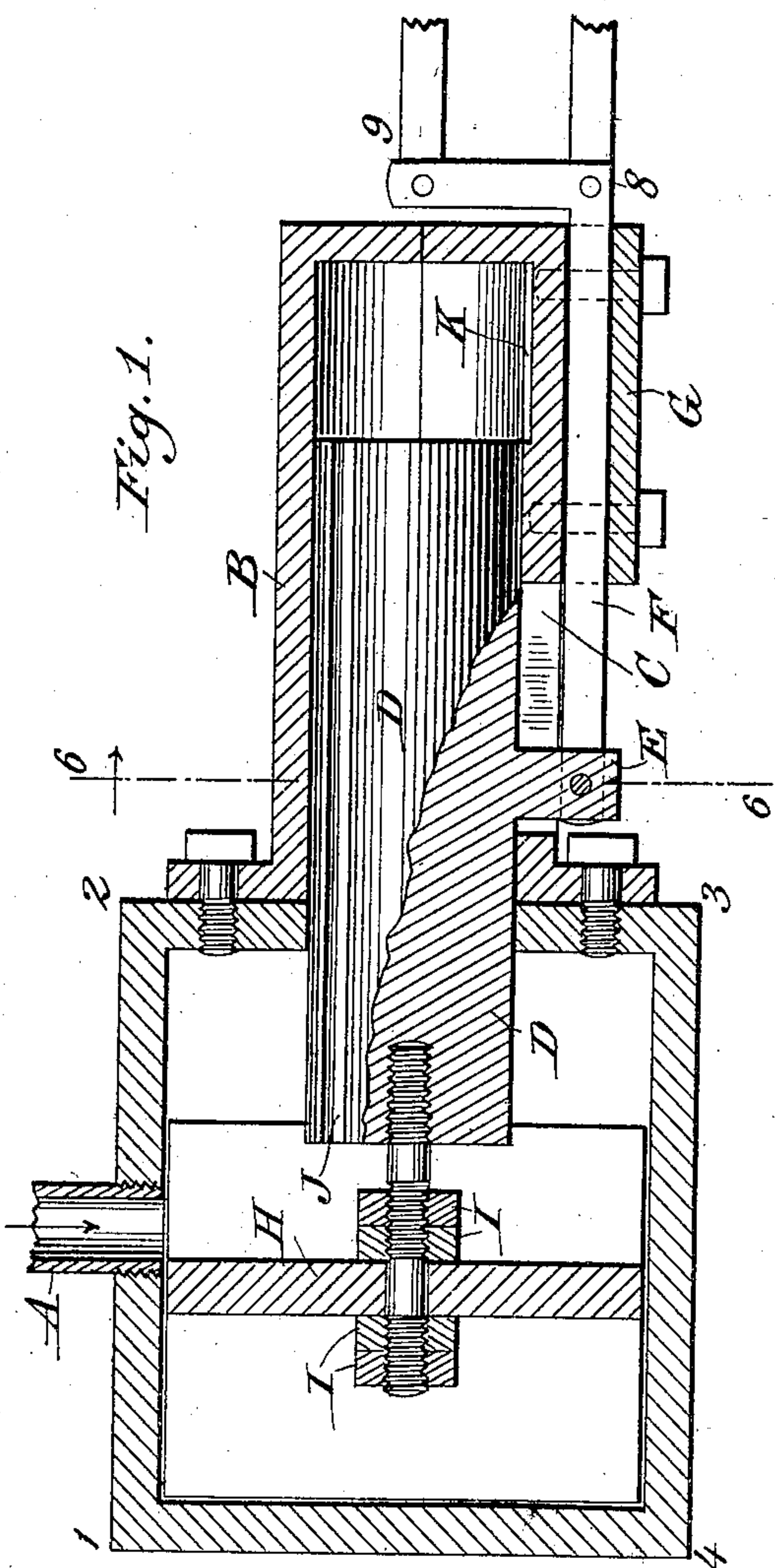
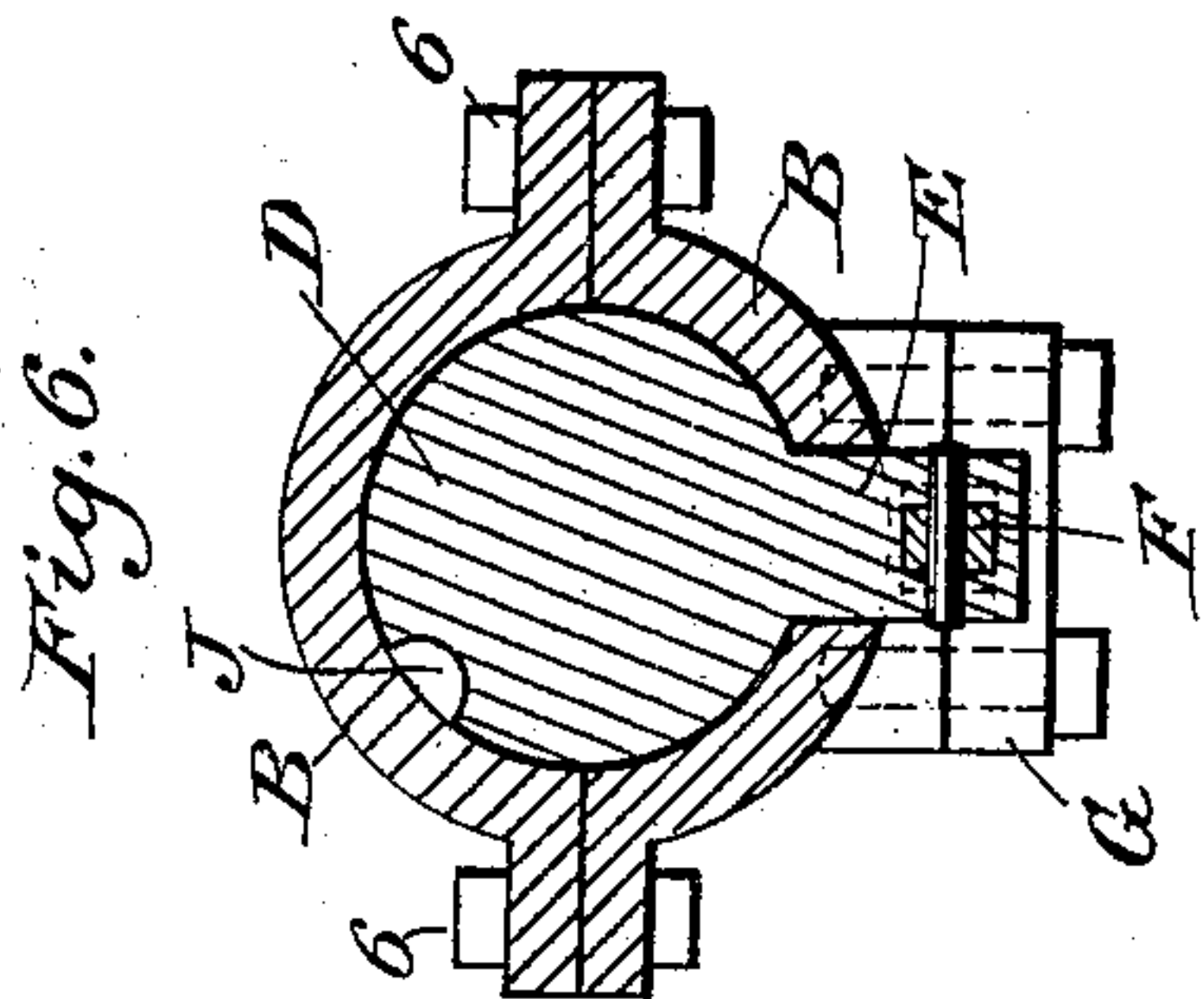
PATENTED MAY 19, 1908.

J. HARGREAVES.

SLIDE VALVE.

APPLICATION FILED OCT. 11, 1907.

2 SHEETS—SHEET 1.



Witnesses:

Robt. J. Blair.  
Philip Pearson

Inventor:

John Hargreaves  
J. R. Perry atty

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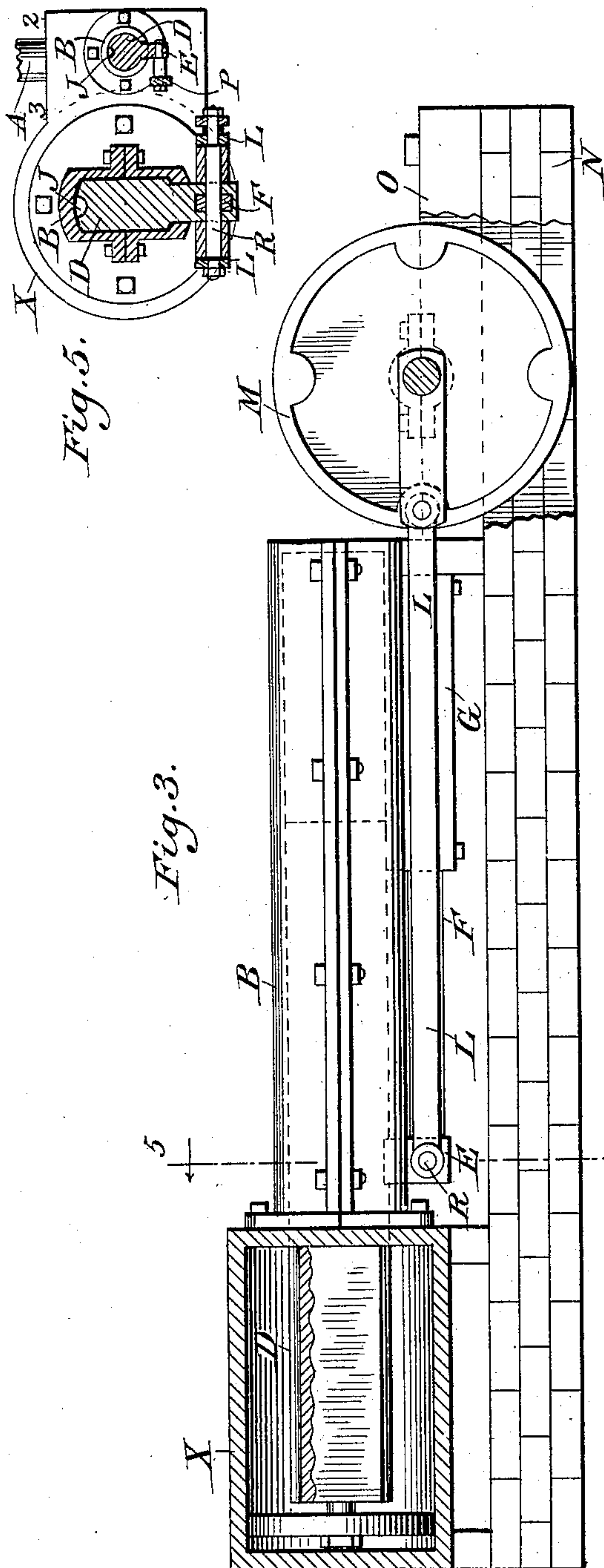


Fig. 3.

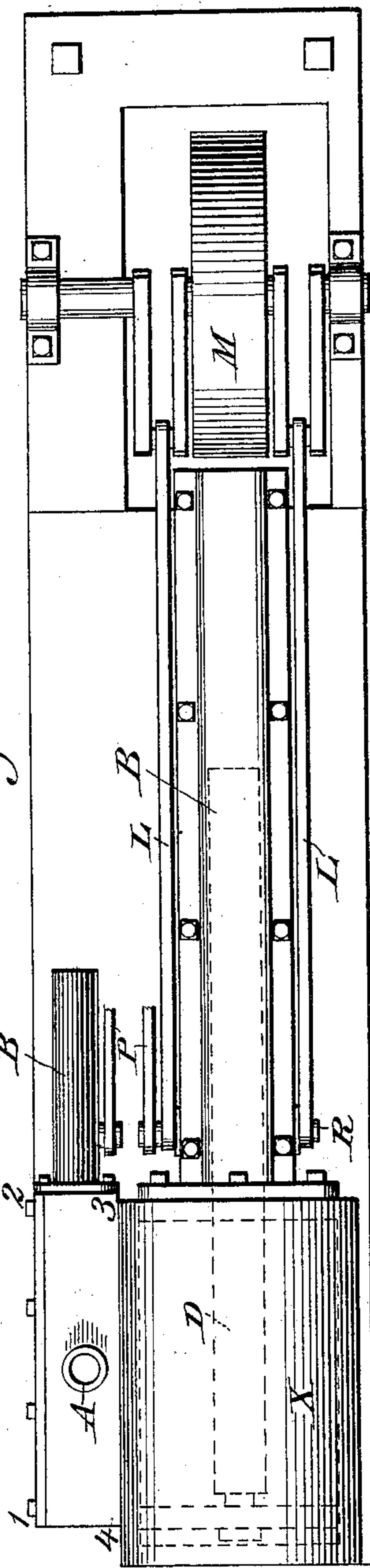


Fig. 4.

Witnesses:  
Robt. J. Blair.  
Philip Pearson.

Inventor:  
John Hargreaves  
J. R. Perry atty



# UNITED STATES PATENT OFFICE.

JOHN HARGREAVES, OF WILKES-BARRE, PENNSYLVANIA.

## SLIDE-VALVE.

No. 887,798.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed October 11, 1907. Serial No. 396,936.

*To all whom it may concern:*

Be it known that I, JOHN HARGREAVES, a citizen of the United States, residing at Wilkes-Barre, in the county of Luzerne and State of Pennsylvania, have invented a new and useful improvement in slide-valves and chambers, attachable to or a part of steam chests and cylinders, for steam-engines or any other expansible fluid or gas engines where packing is required, and for which this improvement is a substitute, of which the following is a specification.

My invention relates to steam engines of all kinds, steam chests and cylinders, or engines using any expansible or explosive gases, which requires packing of piston rods, and has for its object to dispense with all stuffing boxes and steam packings of every kind as now used on engines, which is fully illustrated by the accompanying drawings, in which

Figure 1 is a sectional elevation of a steam chest; Fig. 2 is a partly sectional view of the same; Fig. 3 is a side view of steam cylinder with the slide valve and chamber attached and its connections with a first motion drum; Fig. 4 is a top view of the same partly sectional, including rock shaft P and steam chest and steam cylinder, combined with the above named slide valve and chamber attached to cylinder and steam chest. Fig. 5 shows a sectional end view of the slide valve and the closed valve chamber. Fig. 6 is a sectional view through the line 6—6 of Fig. 1.

Similar letters and figures refer to similar parts in each view.

In Fig. 1, 1—2—3—4 represent the open side of a steam chest, the steam pipe A admitting steam thereto.

B is a section of a chamber attached to the steam chest by means of a rim and bolts, at the bottom of said chamber an opening or slot C is formed, by cutting through its wall this slot C is made to suit the length of stroke of steam chest valve. Within this slotted chamber is placed a slide valve D having a projection E cast thereon which passes below the said slot and of sufficient strength to push and pull the amount of force acting in the steam chest, to this projection is fastened by means of a pivot a rod F, said rod passing through a box G acting as a guide and to secure direct lineal motion, said box being bolted to the chamber B. On the end of slide valve D is secured the steam chest valve

H within the steam chest by means of a bolt threaded into valve D and secured to steam chest valve H by the usual means of jam nuts I. I.

In order to have the steam act with perfect freedom within chamber B the slide valve D dare not fill it completely. Therefore the top portion, or nearly to the top of the slide valve D, is grooved as shown in Fig. 5. When that portion of the steam chest valve H moves either to the one side or the other of the steam pipe A the steam will be forced along the upper portion of slide valve D or drawn out with equal freedom. The said valve D not coming against the end of the chamber B, which chamber has a recess K formed a little below the bottom of valve D to aid in effecting this end so that no suction or cushion in excess of what is required will be had.

Fig. 2 shows the said chamber to be made in two parts and bolted together on each side its entire length by bolts 5, 6 and 7. The object of making this chamber in two parts is to allow the slide valve D having the projection E to be placed within said chamber and to allow of planing out the valve seat. The attached rod F may be operated from a point on a right line parallel to the center of the steam chest, or cylinder, by connecting at 8, or it may be secured to the pivot at 9 on a direct line with the center of the steam chest or cylinder. The slot or opening C may be made as shown at the bottom of the chamber, or at any other part of it, or if required, more than one slide valve can be used in the same manner.

Fig. 3 is a partly sectional view of a cylinder X having the attached chamber B bolted thereto showing slide valve D, projection E, rod F, secured by box G, bolted to the bottom of chamber B, and having a rod L attached to projection E, and connected to a drum M, all resting and secured to the foundation N and bed plate O of a stationary engine built with the improvement herein described. Fig. 4 is a top sectional view of the same showing the attached chamber B. In this case the chamber B is contracted so as to admit of a smaller slide valve D for the purpose of attaching two rods L one on either side, and connected with the drum M. If only one connection is desired with the driving drum M in that case a yoke is formed at the end of chamber B and only one rod or stub may be connected to the shaft or rim of



said drum or pulley, as the case may be. The object of connecting with two rods L is to secure even push or pull and prevent twisting of the valve D. On Fig. 4 is also shown the steam chest 1, 2, 3, 4 and a similar chamber B attached thereto, fully described by Figs. 1 and 2. In addition thereto Fig. 4 shows a rock shaft P and the necessary connections for controlling the steam entering the steam chest x.

Fig. 5 is an end sectional view showing the attached chamber B, valve D, projection of valve E passing through the slotted portion C, and the rods L, of both sides secured to projection E by means of a bolt R. The chamber B may be round or rectangular to suit circumstances.

Having thus fully described my improvement and given a practical illustration of the same by means of Figs. 1, 2, 3, 4, and 5, forming a part of this specification, what I claim as new and useful and desire to secure by Letters Patent is:

1. The combination of a slide valve consisting of a guide within a closed valve chamber, said chamber formed of two or more parts and suitably secured together and said closed chamber secured to a steam chest or steam cylinder or made an integral part of the same, in which said slide valve operates, a slot formed in said valve chamber to allow of a projection E of said slide valve to extend to the outside of said valve chamber and connected by suitable means with outside machinery for operating the same.

2. The combination of a slide valve operating within a closed valve chamber, said chamber having a slot formed therein and covered by said valve said valve having a projection attached to or made an integral part thereof and extending through the wall of said closed chamber, the said projection secured to an outside guide, said guide attached to the wall of said closed valve chamber and the said guide suitably attached to outside machinery for operating the same.

3. The combination of a slide valve having a stem extending into a steam chest through a suitable opening cast therein and connect-

ed to a piston head or steam chest valve, said slide valve operating within a closed valve chamber made of one part or in sections, suitably secured together and to the steam chest or cylinder said slide valve having a projection extending through a slot formed in said valve chamber, and covered by said valve and to be connected and operated outside of said closed valve chamber in moving machinery.

4. A closed valve chamber having a slot and valve, said valve having a projection passing through said closed valve chamber and susceptible of being attached to outside machinery for moving the same, said closed valve chamber having a steam equalizing recess K formed within the same, all in combination with a steam cylinder and steam chest in the manner specified.

5. A closed slide valve chamber composed of two or more parts suitably secured together and to the steam chest or steam cylinder, said chamber having a slot and valve seat formed therein and a projection from said slide valve integral therewith extending to and to be connected with outside machinery or outside mechanism for moving the same, in combination with a steam chest or steam cylinder, said steam chest or steam cylinder having a suitable opening cast in the end thereof to admit of attaching the stem of a slide valve to the piston head of a steam cylinder or the valve of a steam chest for operating outside machinery.

6. A closed valve chamber composed of one or more parts, said chamber having a slot and valve seat formed therein, said valve having a projection E extending through said slot and connected outside of said chamber with outside machinery, in combination with a gas gasolene or petroleum engine cylinder.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HARGREAVES.

Witnesses:

PHILIP PEARSON,  
ROBT. J. BLAIR.