

No. 631,275.

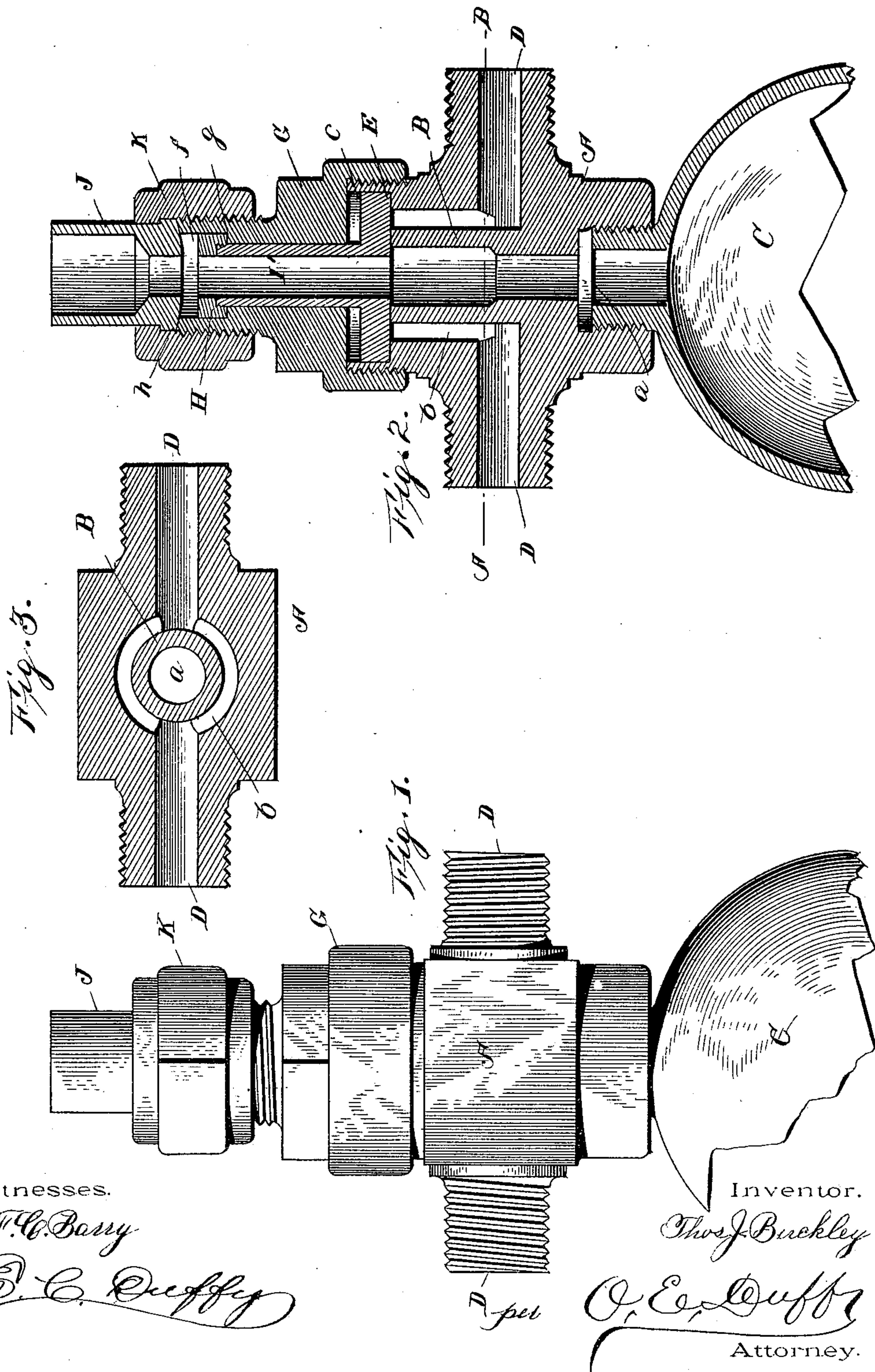
Patented Aug. 22, 1899.

T. J. BUCKLEY.  
LUBRICATOR.

(Application filed Nov. 5, 1897.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses.

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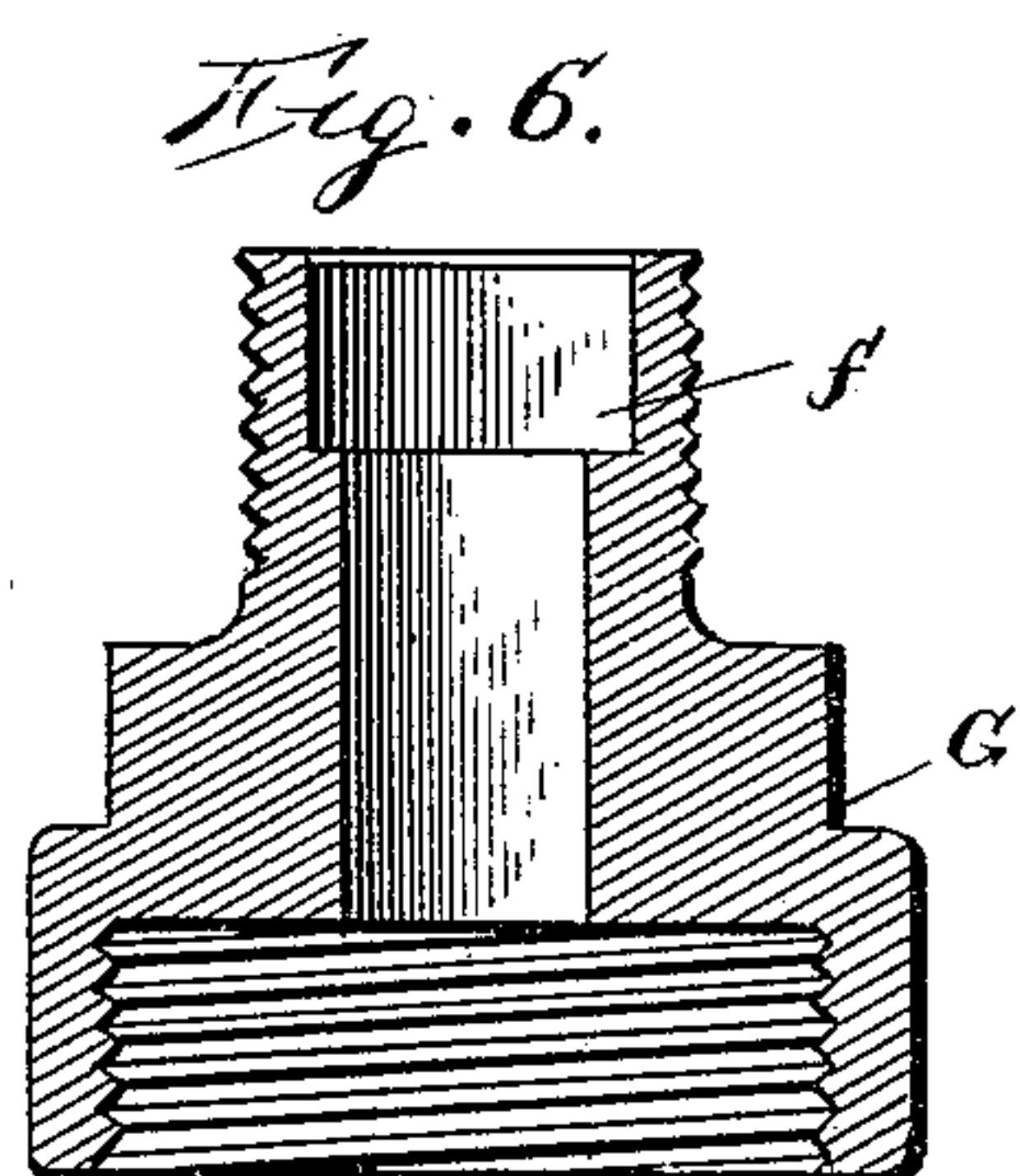
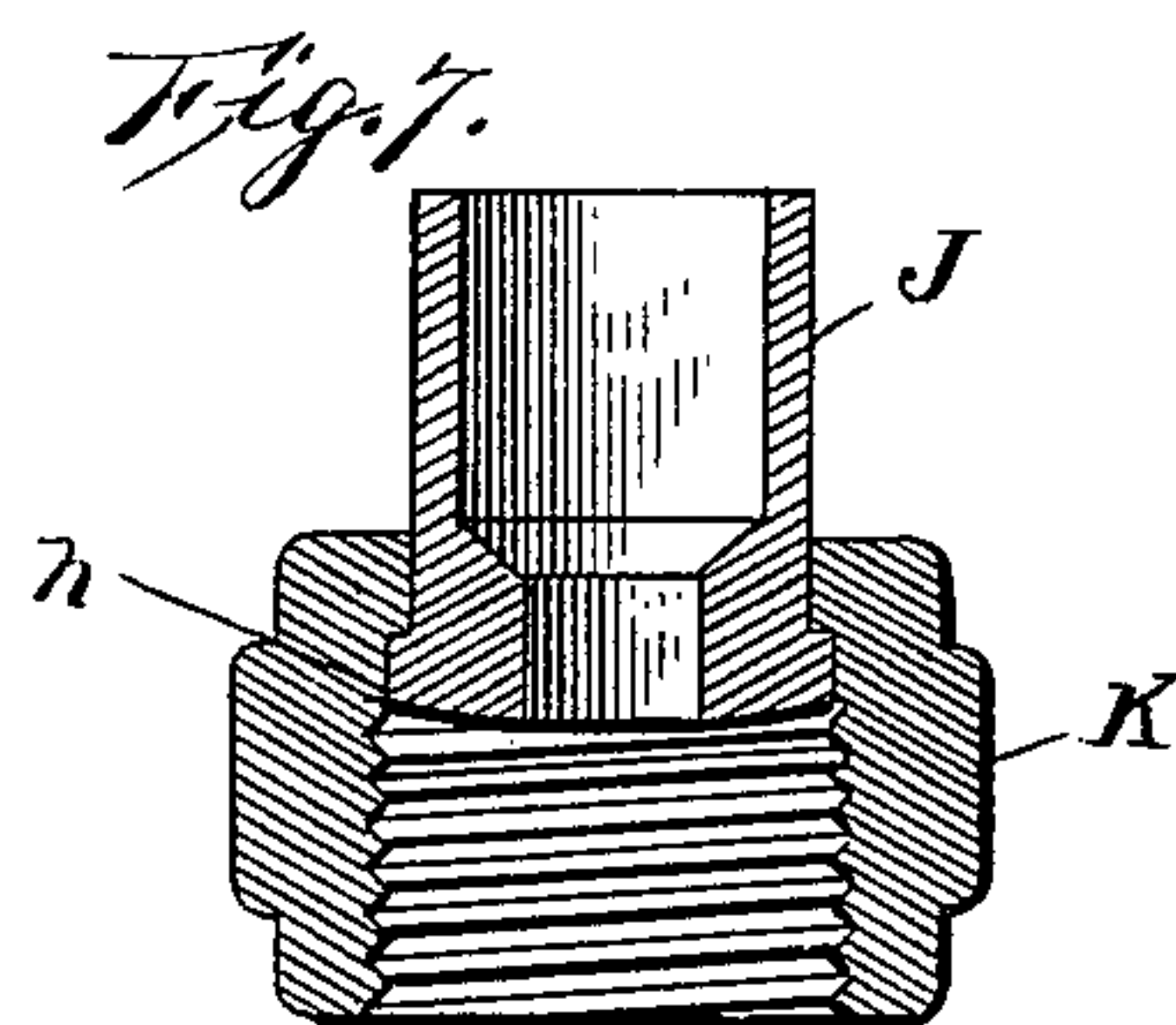
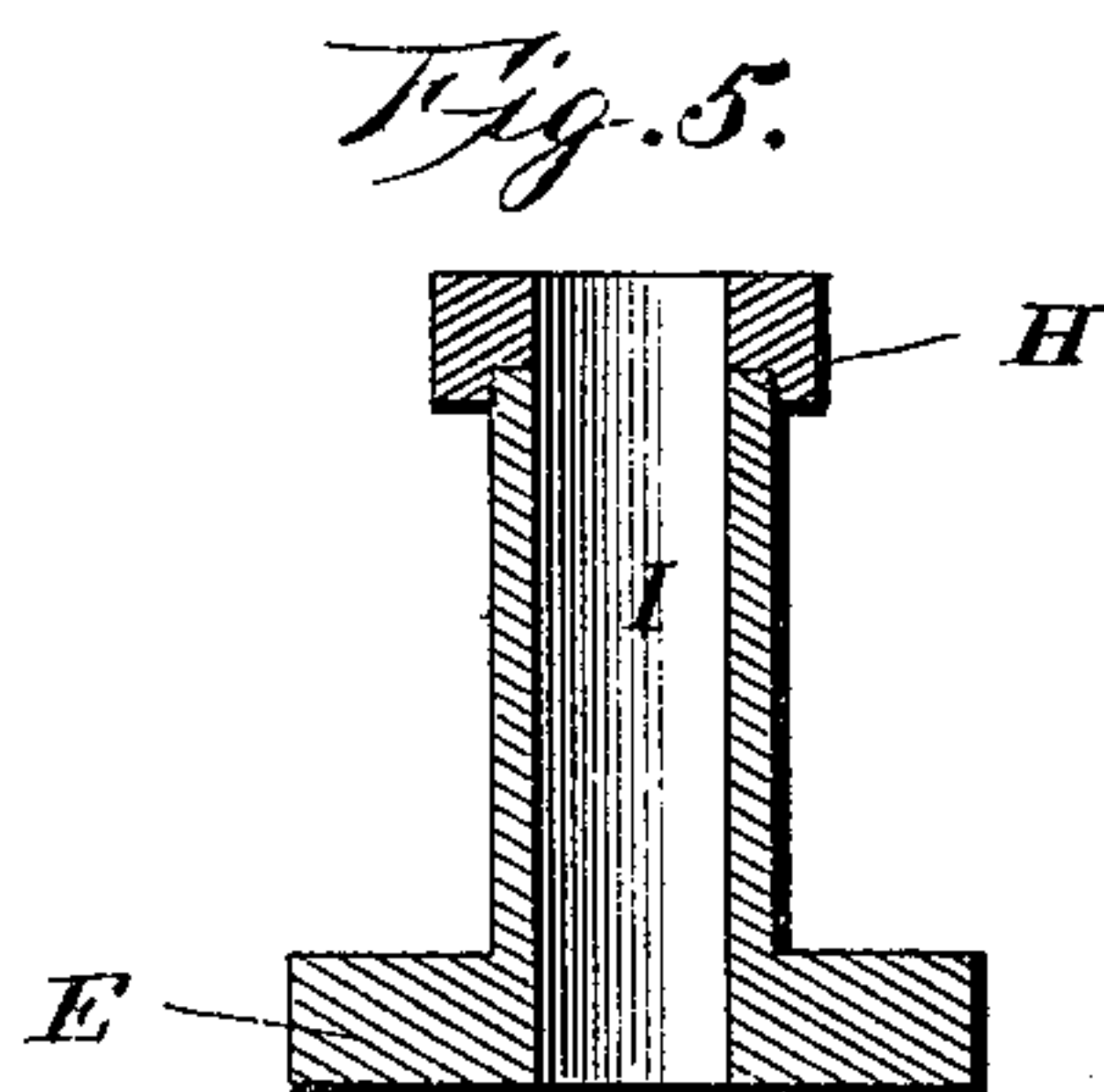
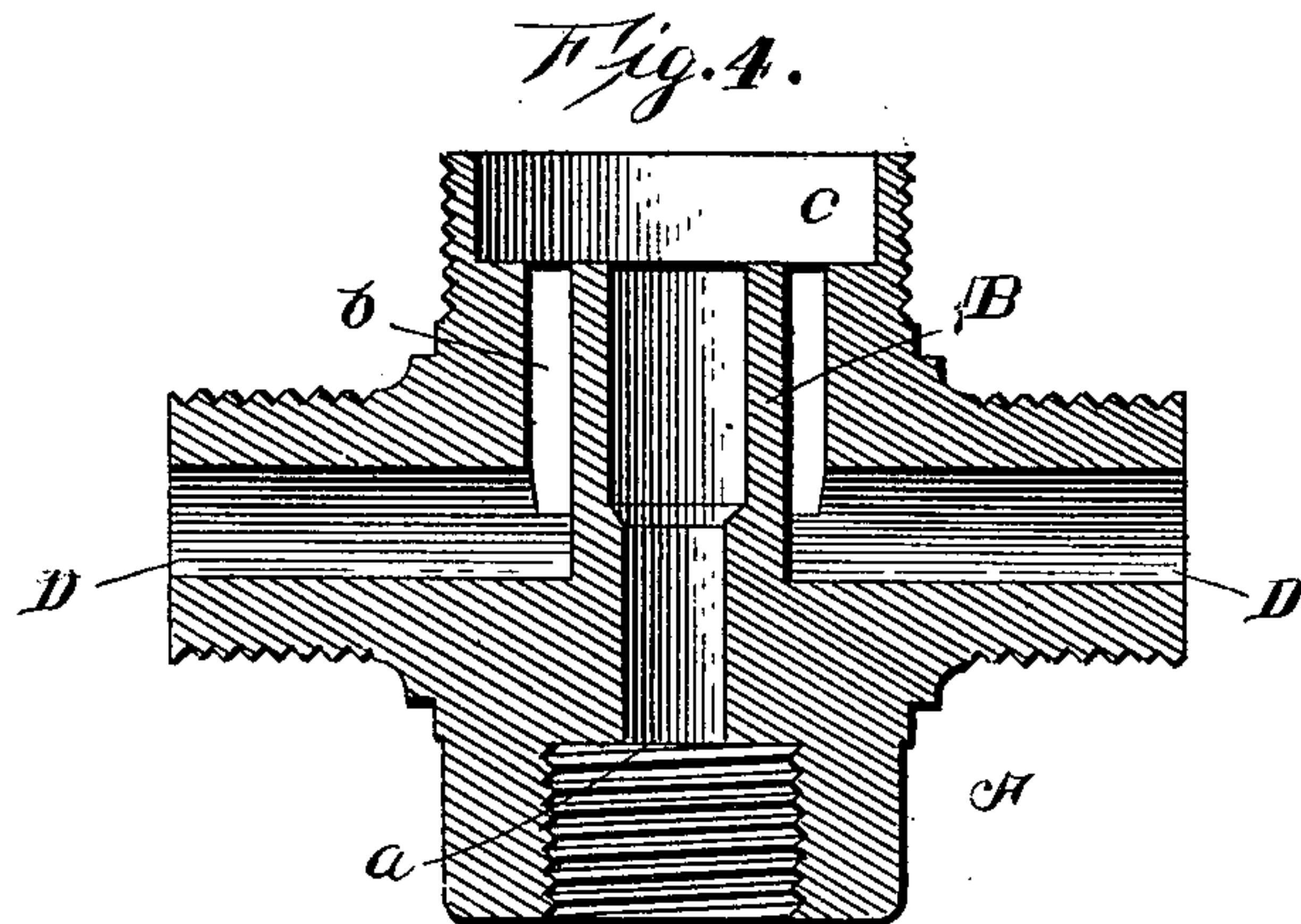
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3 Sheets—Sheet 2.



Witnesses.

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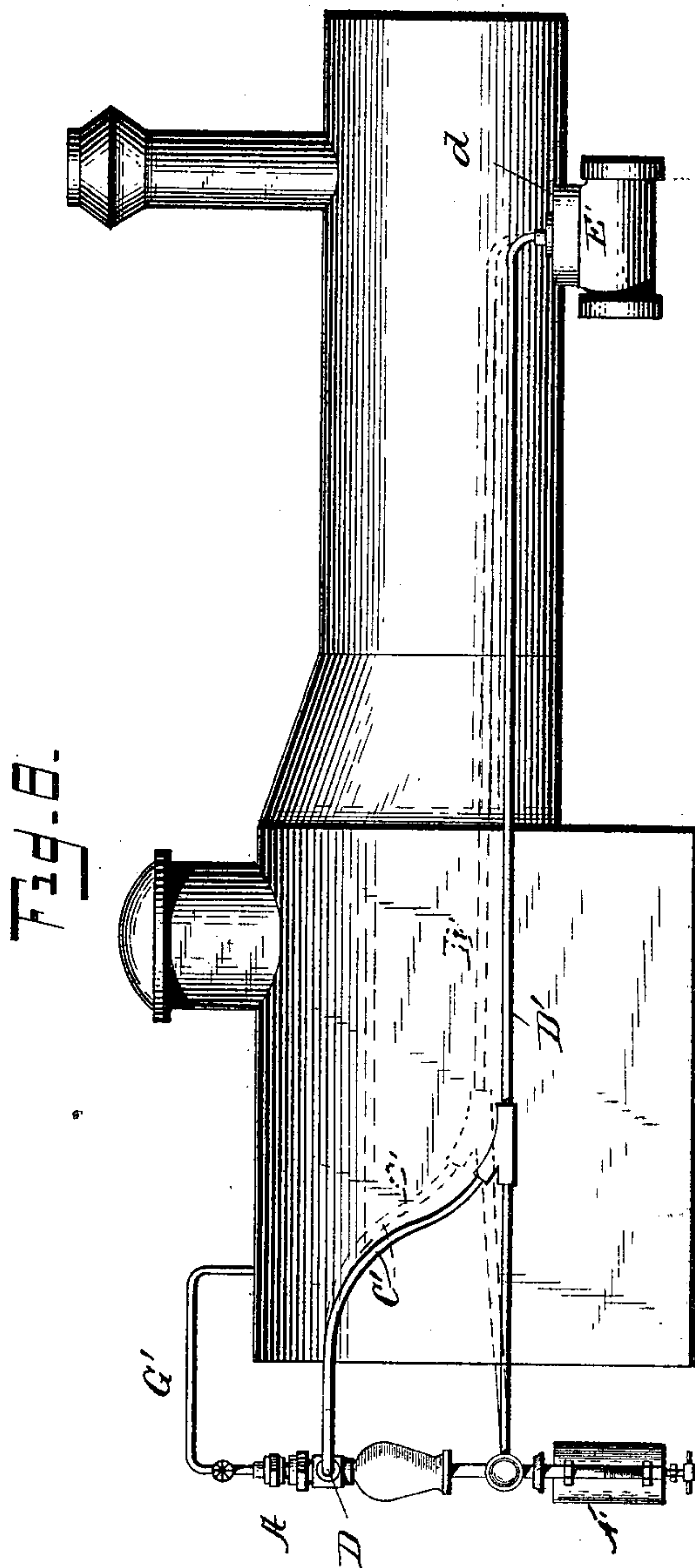
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(No Model.)

3 Sheets—Sheet 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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EDWARD F. BUCKLEY, OF WASHINGTON, DISTRICT OF COLUMBIA.

## LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 631,275, dated August 22, 1899.

Application filed November 5, 1897. Serial No. 657,504. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. BUCKLEY, of Chicago, in the county of Cook and State of Illinois, have invented certain new and  
5 useful Improvements in Lubricators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the  
10 same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The object of my invention is to connect to  
15 the well-known sight-feed lubricator an improved attachment by which certain difficulties are overcome which heretofore existed, particularly in locomotives. The difficulty with the present lubricator is that the oil  
20 passing through the sight-feed glass collects in the long oil-pipes connecting the lubricator with the steam-chest and remains in the pipe until the conditions become more favorable for continuous flow. If a current of steam  
25 could be made to flow continuously through the oil-conveying pipes in the direction from the lubricator to the steam-chest, then the oil would not accumulate in said pipe and the difficulty in regard to this point would be  
30 overcome. The device intended to be applied to the condenser of a lubricator for the purpose of supplying a current of live steam from the boiler through the oil-pipe to the steam-chest, which current is automatically  
35 regulated by the steam-pressure in the steam-chest or by the pulsation of steam-pressure when the oil-pipes are connected to each end of the cylinder of the engine, whereby the current of steam will cause the oil to flow  
40 freely and also prevent it from stopping in the pipe.

The invention consists in certain novel features of construction and in combination of parts by which the lubricant is kept in a fluid  
45 state and is given a positive flow by the current of steam controlled by the device, all of which will be more fully described, and set forth in the claims.

Figure 1 is an elevation of my improved at-

tachment for condenser-lubricators. Fig. 2 50  
is a vertical longitudinal central section. Fig. 3 shows a horizontal section taken on the line A B, Fig. 2. Fig. 4 is a central sectional view of the four-way connection or body portion of the valve. Fig. 5 is a central sectional  
55 view of the valve and stem. Fig. 6 is a sectional view of the upper union connection having the piston-chamber. Fig. 7 is a section of flange-nut with the pipe connection therein. Fig. 8 shows a skeleton view of a loco-  
60 motive with my device attached to the lubricator and the pipes for connecting the same to the steam-chest of the engine and the boiler.

The device consists of a four-way connec- 65  
tion A, having a valve chamber and seat formed in its upper portion. From the center of this seat leads a passage I' into the condenser C of the lubricator. There is an annular space b outside of the passage I', which  
70 leads also from the seat into the passages D D. There is a screw-thread on the lower part of the coupling by which it is connected to the condenser C. The passages D D are in the right and left projecting parts of the coup-  
75 ling, said projection being screw-threaded, so that the steam-pipes leading to each of the oil-pipes of the steam-chests may be connected.

In the upper portion or projection of the 80  
coupling is seated the valve E, provided with a hollow stem I, on the upper end of which is secured the piston H. The hollow stem passes through the union G, which is secured to the coupling, the bottom of the union forming the  
85 top of the valve-chamber, while the upper portion is bored, forming a cylinder for the piston H. To the top of the union G is attached a pipe connection J for connecting the device with the steam-space of the boiler. 90  
Through the valve and its stem, the valve-seat, and the shell A is the steam-passage from the boiler to the condenser C. The pas-  
95 sage in lower side of the connection A is threaded for attaching it to the condenser C by means of the threaded nipple on the condenser. The upper side of the connection A is provided with a valve-chamber c. Secured



above the chamber to the connection A is the union-fitting G. This fitting is provided with a piston-chamber *f*, in which is the annular piston H, secured to the stem of the disk valve E in the chamber *c*.

Steam-pipes C' are connected to the passages D D, leading from the face of the valve into the oil-pipes D' D' on each side of the engine, as shown in Fig. 8. These oil-pipes run either to the steam-chest of the engines on each side of the locomotive or to the cylinders.

It will be observed that the valve-chamber E is larger than the piston-chamber *f* in the union G. This union is truly bored through its entire length and its central portion forms a guide for the valve E.

The union G has a piston-chamber *f* in its upper portion much less in diameter than the valve-chamber in the four-way connection.

The piston H, which consists of an annular ring, is secured to the hollow stem I of the valve E, and as it presents a smaller area to the steam from the boiler which passes through the pipe G' than the under surface of the valve E, which is in communication with the steam-chest, the admission of steam to or cutting it off from the valve-chest will cause the valve to open or close. As before stated, the difference of area between the piston H, with the constant boiler pressure and the increased area presented by the face of the valve through the steam and oil pipe leading to the valve-chest, will cause the valve to open against the pressure on the piston when steam is admitted to the chest, thus admitting steam from the boiler to the chest through the oil-pipes, causing a free flow of oil that is fed into the pipes from the lubricator. The proportion of the area of the piston to that of the valve is about one to two. Therefore the steam-pressure in the steam-chest could be much lower than that in the boiler and the valve would still operate.

The nut K has flange *h* and, secured down on the upper end of union G, binds pipe connection J in position. The pipe G' connects by means of a pipe to the boiler or to the live-steam pipe between the boiler and throttle-valve.

Referring to Fig. 8, A' is a sight-lubricator secured to the front of the boiler, with my device A attached to the condenser-chamber, with the steam-pipe G' leading into its top from the boiler. A side view of the device is shown, as it is the proper position for leading each of the steam-pipes C' to each side of the boiler, one being shown in dotted lines for connecting to the oil-pipes D' D', similarly arranged, leading from the lubricator to the steam-chest *d* of the cylinder E'.

In putting the parts together put the valve in the chamber of the four-way connection A, then screw the union connection G on over the valve, the hollow valve passing through it, then screw the small piston on the valve-

stem, put the nipple through the nut, and finally screw the nut on the end of the union connection.

The operation is as follows: Steam is turned on the lubricator attachment from the boiler, the pressure of which acts on the piston H and keeps the valve closed, but does not prevent the steam from entering the condenser of the lubricator. In this position of the valve steam cannot enter the valve-chests through the oil-pipes; but as soon as the throttle-valve is opened, admitting steam from the boiler to the steam-chest, the steam-pressure will pass up through the oil-pipes and acting on the bottom surface of the valve, which has a greater area than the piston above, the valve will open and permit steam to pass from the boiler through the oil-pipes to the chests, carrying the oil with it.

The flow of steam through the oil-pipes is caused by a lower pressure of steam in the chest than in the boiler, since it is a well-known fact that the pressure is always lower in the pipes or chest the farther the pipe or engine is from the boiler.

By proportioning the area of the valve E with that of the piston H in relation to difference of pressure in the steam chest and boiler the valve E can be made to lift at any given pressure in the steam-chest, and thereby admit steam into the oil-pipes producing the desired current, and consequently the continuous flow of oil to the steam chest or cylinder.

It is evident that various slight changes might be made in the forms, construction, and arrangements of parts described without departing from the spirit and scope of my invention. Hence I do not want to limit myself to the exact construction herein set forth.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In an attachment for sight-feed lubricators the combination of a four-way connection provided with an annular valve-seat forming an annular space between the seat and casing, outlet-passages connecting the annular space with the steam-chests, a coupling over the valve-seat provided with a cylinder, a piston in the cylinder and a valve in the seat connected to the piston, substantially as described.

2. In an attachment for sight-feed lubricators the combination of the condensing-chamber with the four-way connection attached to the condensing-chamber and provided with a perforated valve-seat leading into the condenser, a centrally-perforated valve on the seat and a pipe connection above the valve leading from the boiler, all forming a free passage of steam to the condenser, substantially as shown and described.

3. In an attachment for sight-feed lubricators the combination of a four-way connection having a raised annular valve-seat and a valve-chamber, a valve on the seat within the



chamber, a piston-chamber, a piston connected to the valve a pipe for admitting steam to the piston from the boiler and pipes leading from the steam-chest to the face of the valve, substantially as shown and described.

4. In an attachment for sight-feed lubricators the combination of a four-way connection provided with a valve chamber and seat, a union secured to the connection forming the top of the chamber and provided with a piston-chamber, a piston in the chamber connected to the valve in its chamber, substan-

tially as shown and described, and a pipe leading from the boiler to the piston-chamber and pipes leading from the valve-chests to the valve-chamber.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

THOS. J. BUCKLEY.

Witnesses:

JAMES E. CHAPMAN,  
WILLIAM J. MAINS.