

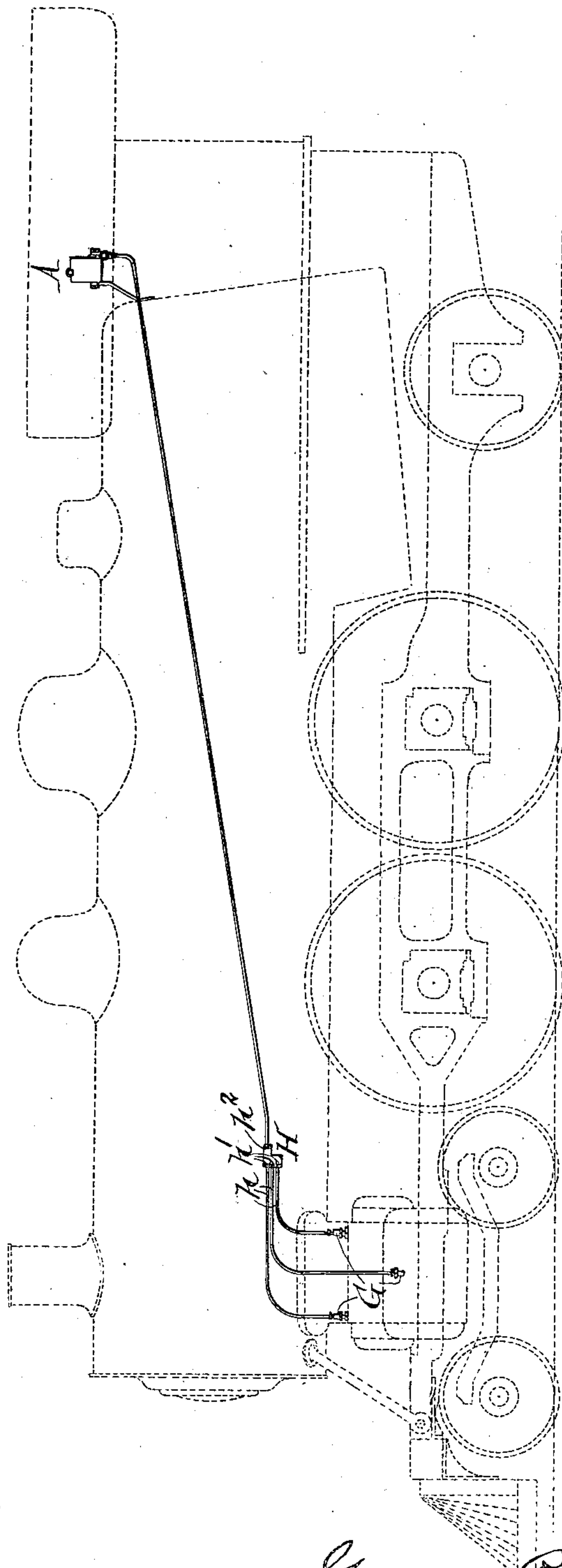
No. 827,381.

PATENTED JULY 31, 1906.

C. W. MANZEL.  
LUBRICATING APPARATUS.  
APPLICATION FILED AUG. 28, 1906.

3 SHEETS—SHEET 1.

*Fig. 1.*



*Witnesses:*

*Louis W. Gratz.*  
*May E. McArthur*

*by Geyer & Popp*

*Chas. W. Manzel,*  
*Inventor*  
*Attorneys.*

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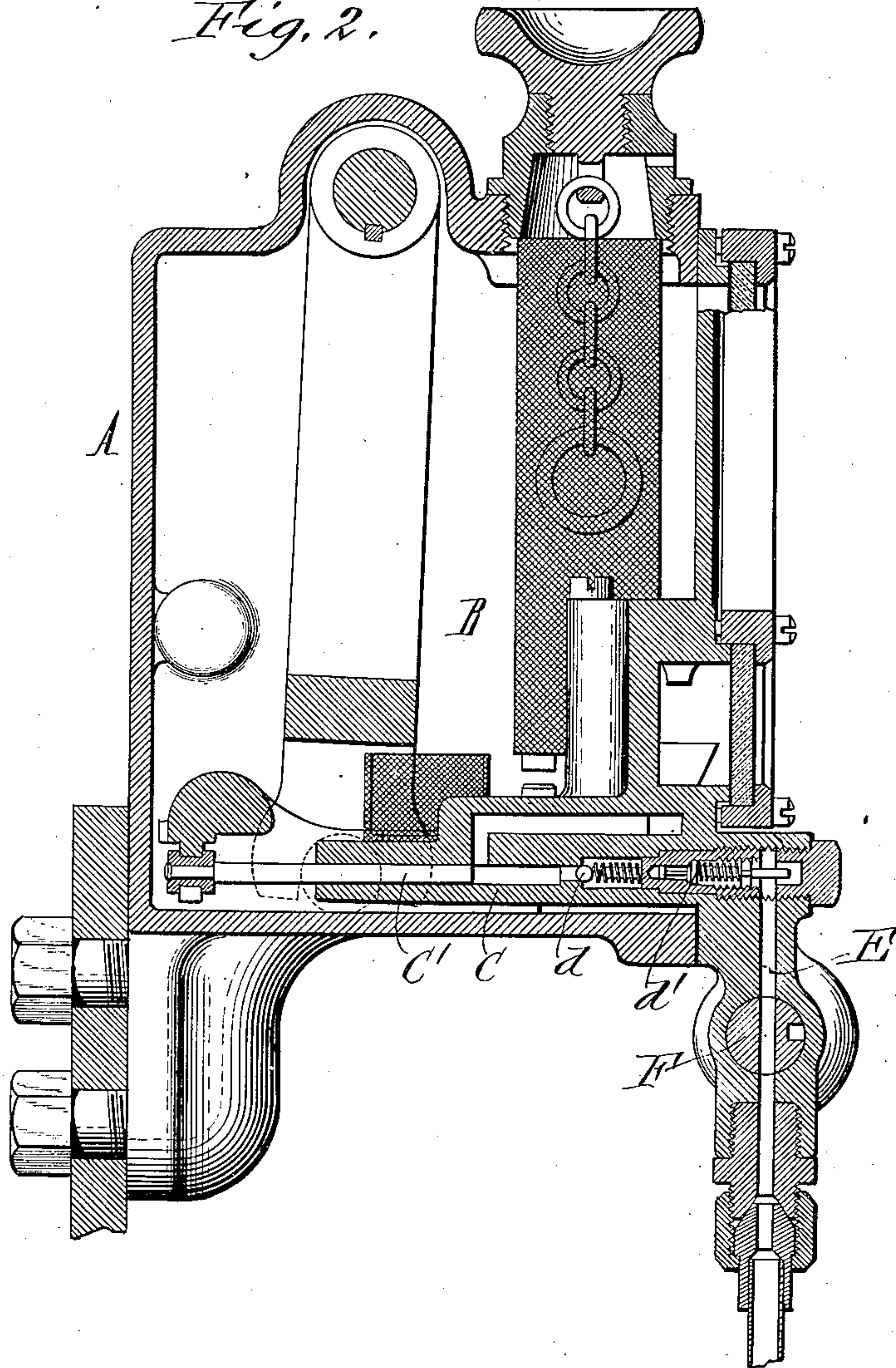
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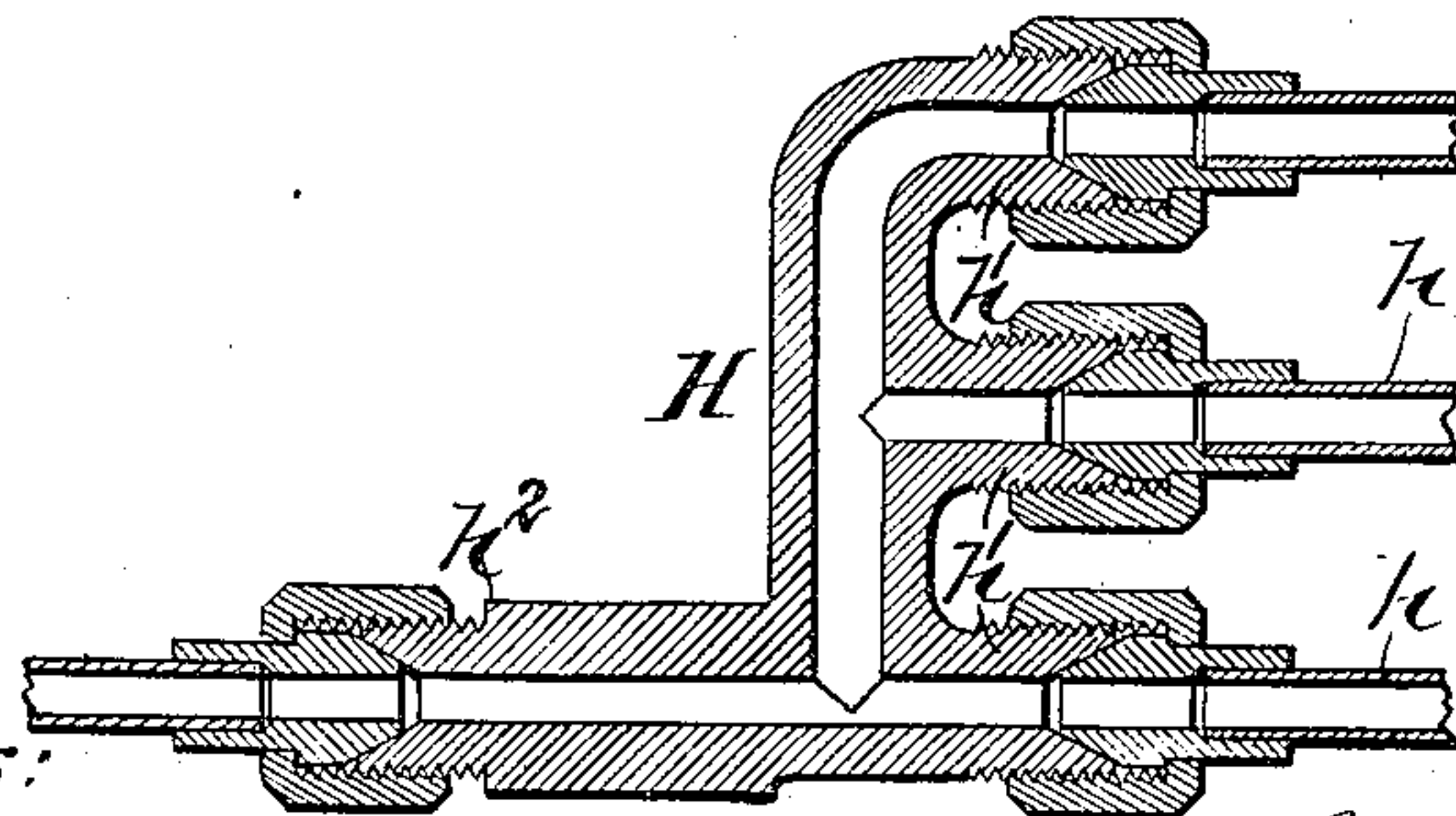
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3 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



Witnesses:

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*May E. McArthur*

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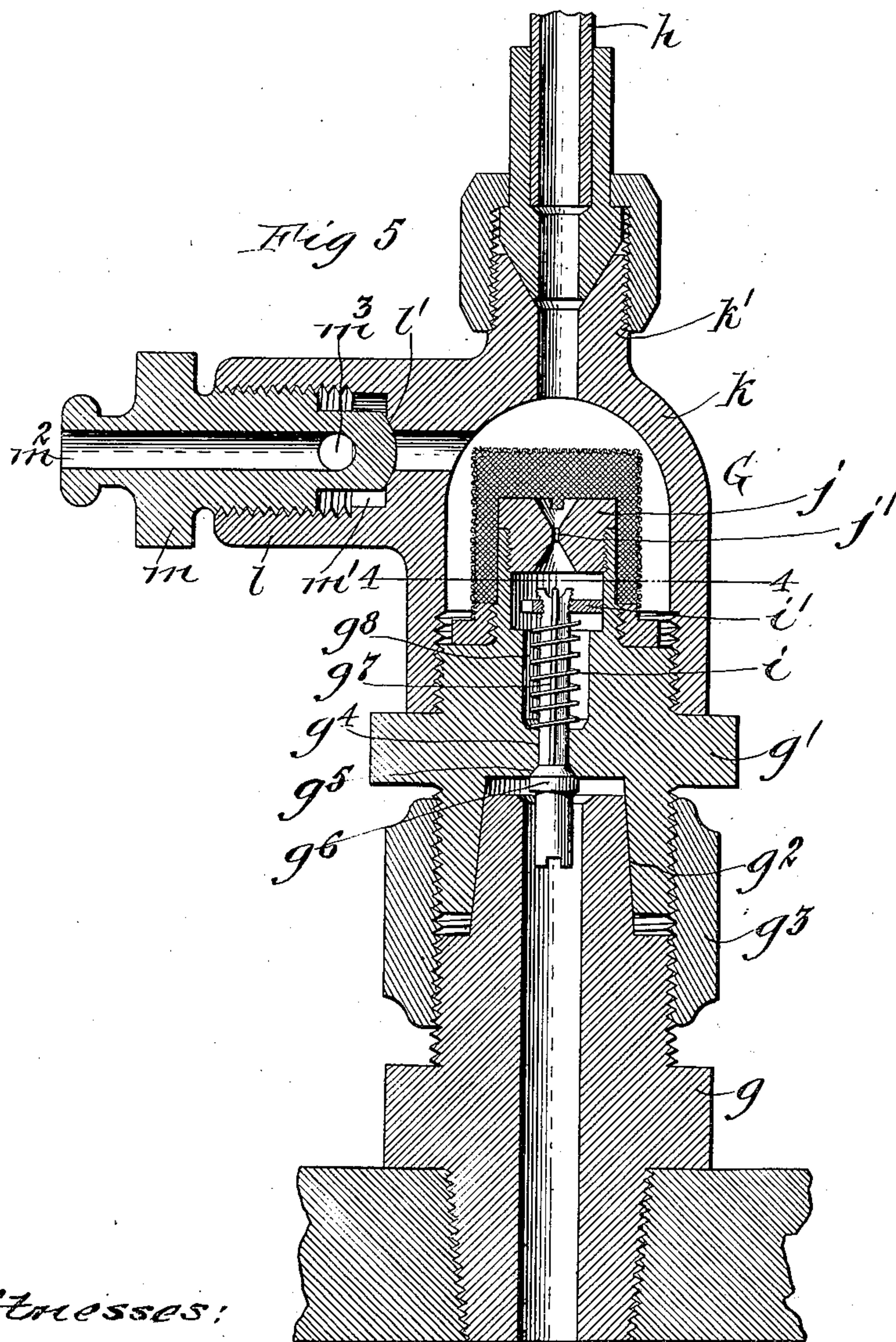
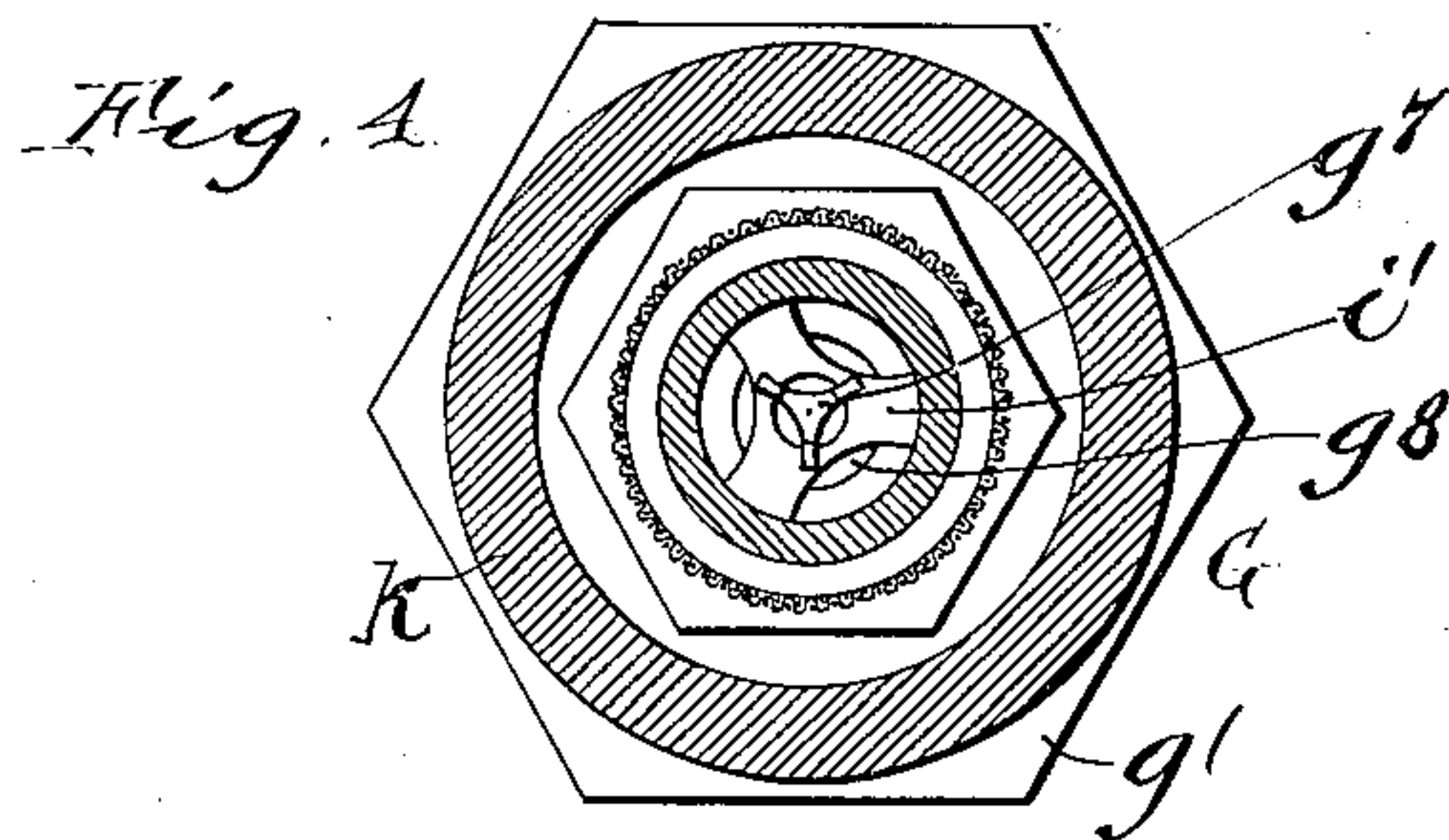


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3 SHEETS—SHEET 3.



Witnesses:

Louis W. Gratz.  
May E. McArthur

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# UNITED STATES PATENT OFFICE.

CHARLES W. MANZEL, OF BUFFALO, NEW YORK.

## LUBRICATING APPARATUS.

No. 827,381.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed August 28, 1905. Serial No. 276,036.

*To all whom it may concern:*

Be it known that I, CHARLES W. MANZEL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Lubricating Apparatus, of which the following is a specification.

This invention relates to a force-feed lubricating apparatus designed more particularly for the steam-cylinders of locomotives; but the same is also applicable to other engines in which it is desirable to supply oil to different points from a common source.

The object of my invention is to provide a simple apparatus of this kind which insures a uniform distribution of the oil to a plurality of chest-plugs or similar lubricating devices connected with the same feed pipe or conduit.

In the accompanying drawings, consisting of three sheets, Figure 1 is a side elevation of the apparatus applied to a locomotive which is shown by dotted lines. Fig. 2 is an enlarged vertical section of the lubricator. Fig. 3 is a longitudinal section of the distributor. Fig. 4 is a horizontal section of one of the chest-plugs in line 4-4, Fig. 5. Fig. 5 is an enlarged vertical section of the same.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates a force-feed lubricator of any suitable construction, which is located in the cab when the apparatus is applied to a locomotive.

In the lubricator shown in the drawings, Fig. 2, B is the oil-reservoir, C the cylinder of the force-pump located in the lower portion of the reservoir, and C' the pump-plunger, which may be reciprocated by any suitable or well-known actuating mechanism.

d d' are check-valves located in the discharge-passage of the pump-cylinder, and E is the delivery-passage of the lubricator, connected with said discharge-passage and preferably containing a suitable stop-cock or controlling-valve F.

G indicates the chest-plugs of one of the steam-cylinders, the locomotive (shown by dotted lines in Fig. 1) being of the superheated type in which each cylinder is provided with three of such plugs. h indicates the individual feed-pipes of these plugs, which are respectively connected with three discharge branches or nipples h' of a manifold or distributor H, as shown in Figs. 1 and 3. The distributor also has an inlet branch or nipple

h<sup>2</sup>, which is connected with the delivery-passage E of the lubricator, so that the several chest-plugs connected with the distributor are supplied by the same pump. Each of these chest-plugs is provided with a choke or constricted passage for effecting an equal distribution of the oil to the several plugs supplied by the same pump, and for this purpose they are preferably constructed as follows:

g indicates the hollow stem or post of the chest-plug, which is screwed into an opening of the steam-chest, and g' is a head surmounting the post and provided in its lower end with a tapering socket g<sup>2</sup>, which receives the correspondingly-shaped upper end of the post. The post and the head are united by a screw-threaded collar or union g<sup>3</sup>. The head has an axial oil-passage g<sup>4</sup>, provided at its lower end with a seat g<sup>5</sup>, against which a check-valve g<sup>6</sup> is adapted to close. This valve has a grooved or winged stem g<sup>7</sup>, which extends upwardly through an enlargement g<sup>8</sup> of the oil-passage g<sup>4</sup>, and the same is held against its seat by a spring i, applied to said stem and bearing at its lower end against the bottom of said enlargement and at its upper end against a nut or collar i', secured to the stem. The valve g<sup>6</sup> prevents the water of condensation from entering the feed-pipe h and also prevents loss or waste of the oil in the feed-pipe when the locomotive is drifting or at rest.

j indicates a choke-plug applied to the upper end of the head g' and provided with a constricted central passage j', which is gradually contracted from the upper end to about the middle of the plug and then flared toward the lower end thereof, as shown in Fig. 5.

k indicates a hood or inlet-chamber surmounting the head g' and inclosing the choke-plug j. This chamber is provided at its upper end with an inlet branch k', to which the front end of the feed-pipe h is connected, and at one side thereof with a vent or vent-nipple l for the escape of the air in said feed-pipe and the chest-plug. The outer portion of the bore of this vent-nipple is enlarged to form an internal seat or shoulder l', against which the inner end of a screw-plug m bears, which normally closes the outer end of the reduced portion of said bore. This plug is reduced at its inner end to leave an annular space m' between the same and the wall of the nipple and is provided with a longitudinal passage m<sup>2</sup>, which extends from its outer end nearly to its inner end and communicates



with said annular space by a transverse passage  $m^3$ , intersecting the inner end of the longitudinal passage. Upon partly unscrewing the hollow plug  $m$  any air in the chest-plug and the feed-pipe connected therewith is allowed to escape through the hollow plug.

By this construction and arrangement the oil forced through the distributor  $H$  into the several chest-plugs connected therewith is checked or retarded in its passage through the plugs by the constrictions in the choke-plugs. The surplus or portion of the oil in each chest-plug which does not find a quick exit through the restricted passage of its choke-plug  $j$  exerts a back pressure upon the oil in the distributor  $H$  and the feed-pipes  $h$  of the other chest-plugs which equalizes the pressure in all of the chest-plugs of the same feed-pipe, and thereby effects a uniform supply and distribution of oil to them. To produce this effect, the actuating means of the oil-pump should be of a character to impart quick and sudden impulses to the plunger, so as to drive the oil through the feed-pipes and into the chest-plugs with sufficient force and speed to produce such equalizing or back pressure. Any suitable operating mechanism which will produce that action of the plunger may be used for this purpose; but I prefer to employ an air-motor of the type comprising a cylinder and piston and valve mechanism for alternately admitting the pressure fluid to opposite ends of the cylinder, the motor being conveniently supplied from the usual pressure-tank of the air-brake apparatus.

As the lubricant is uniformly supplied to a number of chest-plugs by the same pump, the necessity of providing a separate pump for each plug is obviated, thus simplifying the construction of the apparatus, rendering it

more compact, and reducing its cost accordingly.

I do not wish to claim in this application the construction of the lubricator itself herein shown, as the same forms the subject of a separate application filed by me August 24, 1905, Serial No. 275,515, nor the chest-plug with the plugged vent  $l$ , as the same is claimed in another application filed by me August 19, 1905, Serial No. 274,832.

I claim as my invention—

1. In a lubricating apparatus, the combination of a reservoir, a pump supplied therefrom, a manifold or distributor connected with the delivery-passage of the pump, and a plurality of chest-plugs or oil-posts connected with said distributor by individual feed-pipes and each chest-plug or oil-port provided with a feed-passage having a choke or constricted portion, and a check-valve arranged in said passage and closing toward the corresponding feed-pipe, substantially as set forth.

2. In a lubricating apparatus, the combination of a reservoir, a pump supplied therefrom, a manifold or distributor connected with the delivery-passage of the pump, and a plurality of chest-plugs connected with said distributor and each provided with a feed-passage, a check-valve arranged in the feed-passage of each chest-plug, and a choke-plug arranged in each of said passages above the corresponding check-valve, substantially as set forth.

Witness my hand this 24th day of August, 1905.

CHARLES W. MANZEL.

Witnesses:

C. F. GEYER,  
E. M. GRAHAM.