

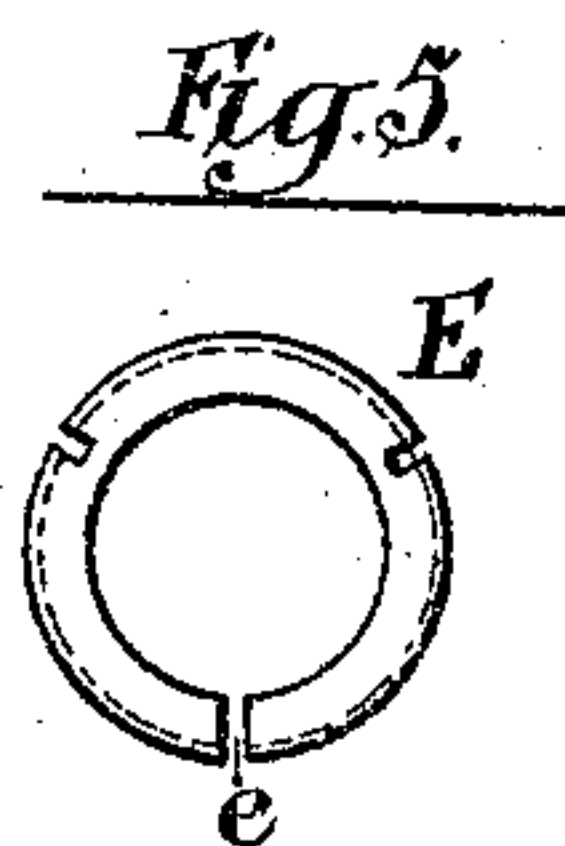
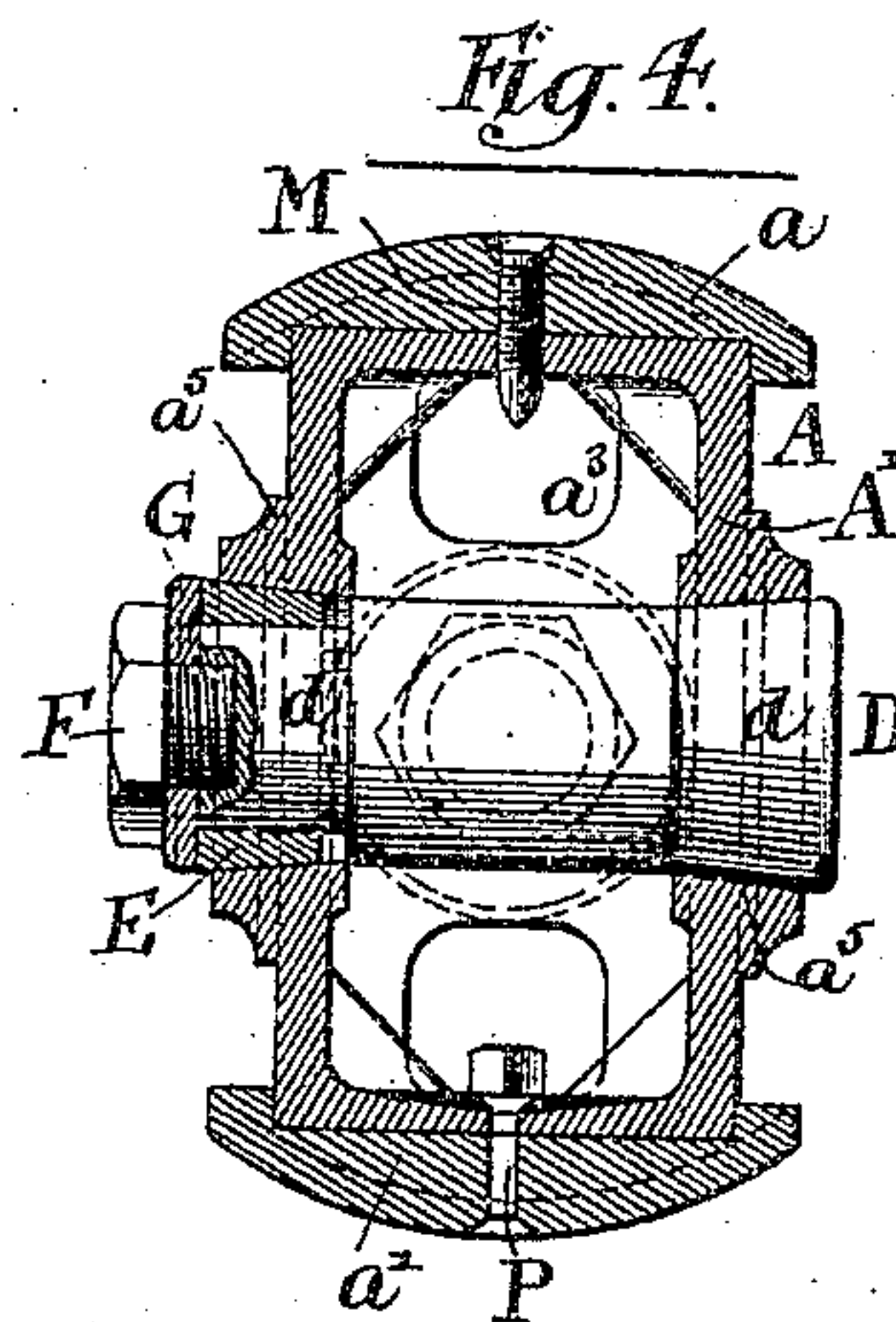
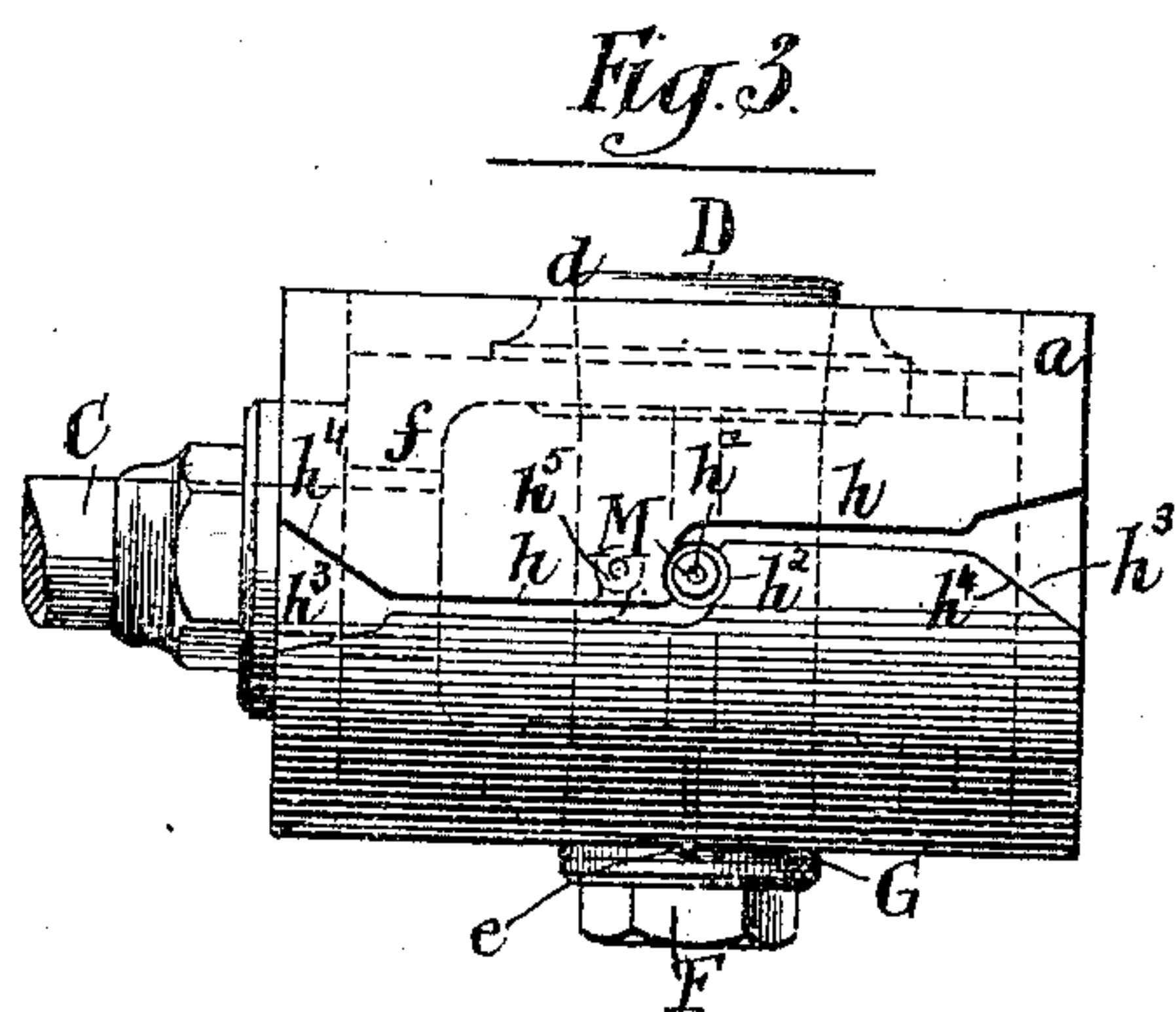
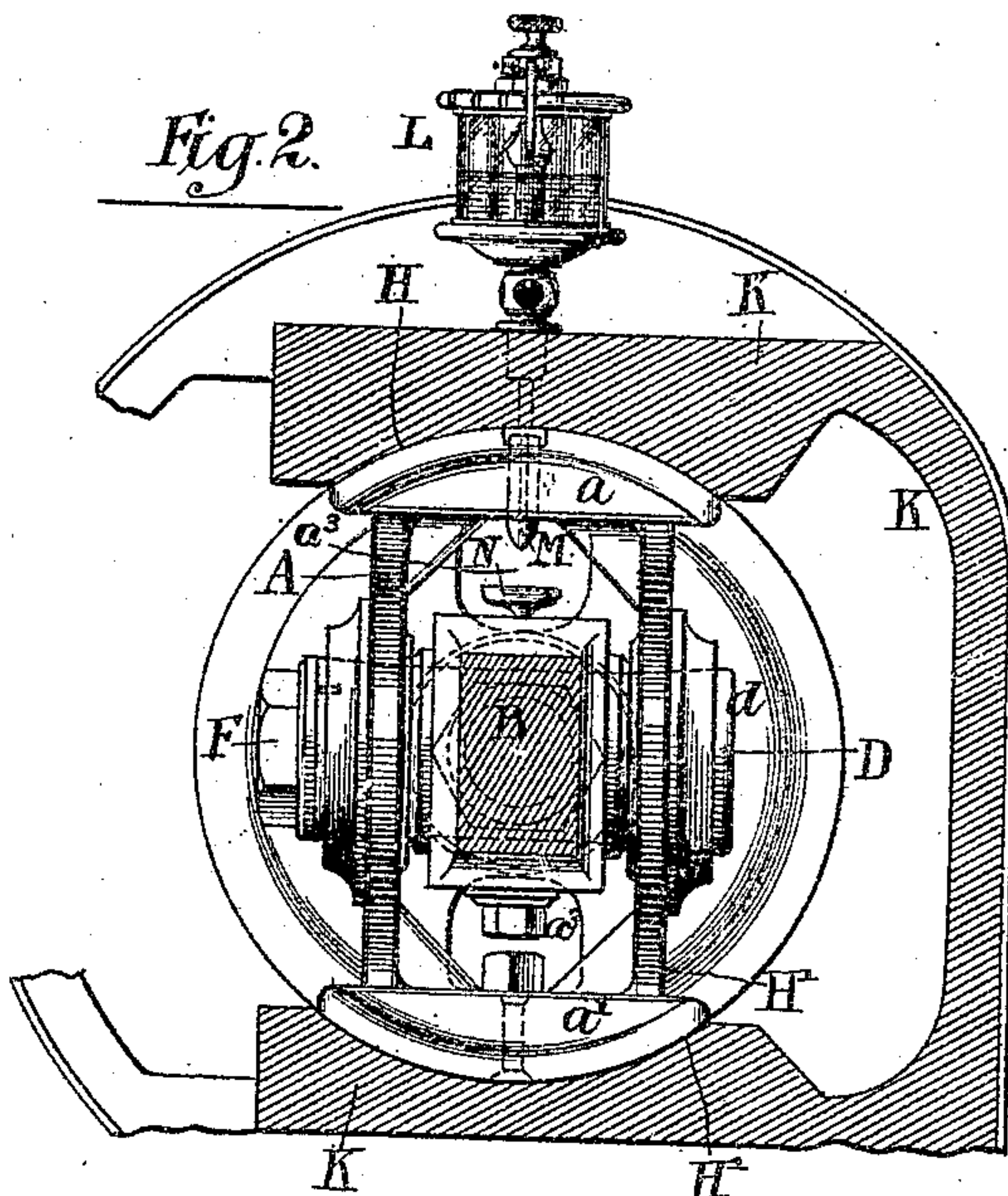
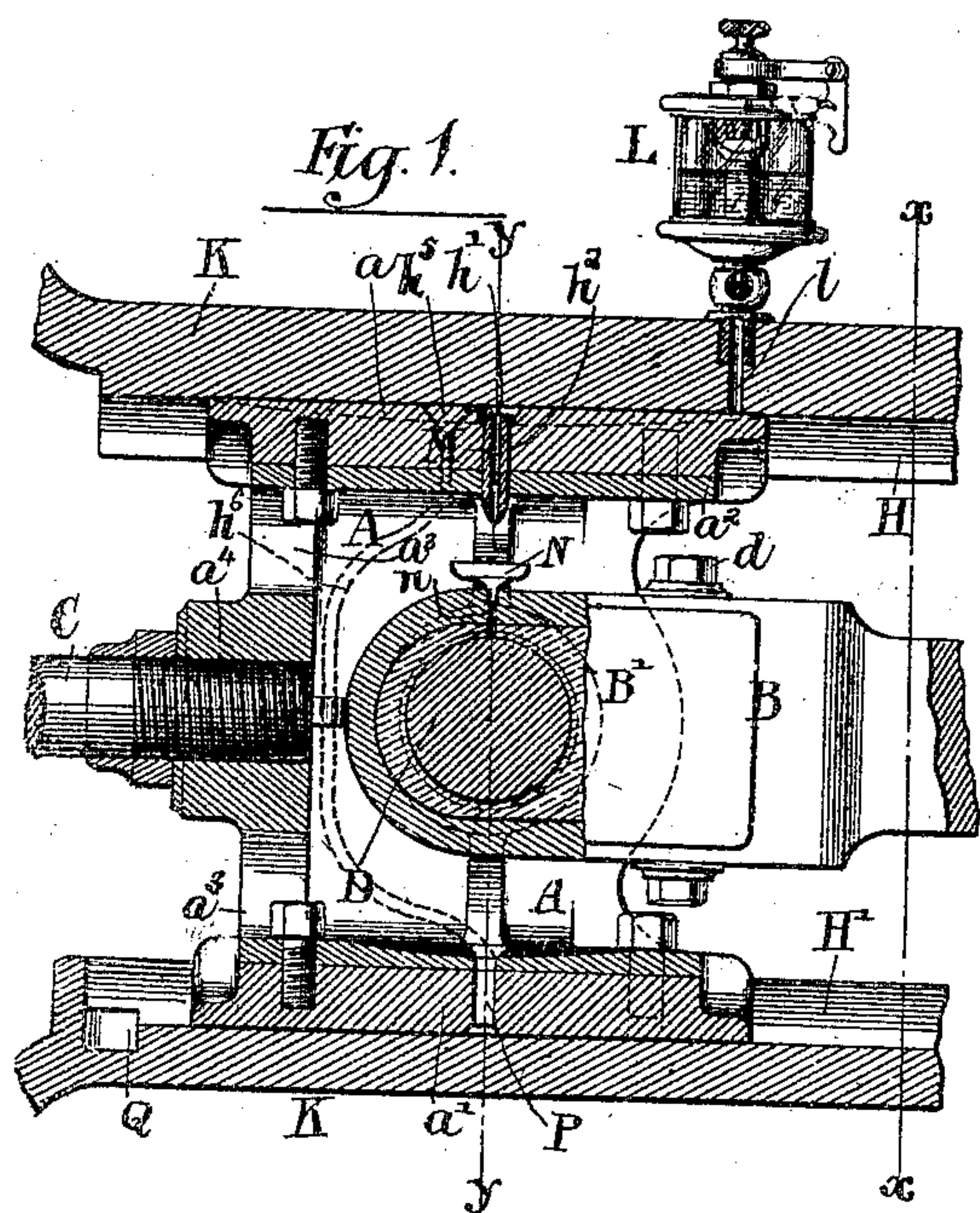
(No Model.)

A. L. IDE.

STEAM ENGINE CROSS HEAD LUBRICATOR.

No. 321,726.

Patented July 7, 1885.



Witnesses:-

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# UNITED STATES PATENT OFFICE.

ALBERT L. IDE, OF SPRINGFIELD, ILLINOIS.

## STEAM-ENGINE CROSS-HEAD LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 321,726, dated July 7, 1885.

Application filed January 14, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT L. IDE, of Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful  
5 Improvements in Steam-Engine Cross-Head Lubricators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of  
10 this specification.

The general object of this invention is to provide an improved construction in lubricating devices for the cross-heads and cross-  
15 head guides of steam-engines; and it consists in the matter hereinafter described, and pointed out in the appended claims.

The principal features of novelty in my invention are embodied in the means shown for  
20 lubricating the upper and lower cross-head guides and the bearing-surface of the wrist-pin, whereby the parts mentioned are all effectively lubricated from a supply of oil initially fed to the upper cross-head guide and  
25 conducted to the said several parts, as hereinafter fully set forth.

The invention may be more fully understood by reference to the accompanying drawings, in which Figure 1 represents a longitudinal section taken on a vertical plane through  
30 the cross-head and guides therefor, with a portion of the connecting-rods also shown in section. Fig. 2 is a transverse vertical section taken through the guides upon line  $x x$ , the cross-head being shown in elevation. Fig. 3  
35 is a top plan view of the cross-head, and illustrates the channel formed in its top slide or bearing-surface. Fig. 4 is a transverse section, taken on line  $y y$  of Fig. 1, showing the  
40 wrist-pin in elevation, with the exception of one end thereof, which is shown in section. Fig. 5 is a detail, showing a tapered bushing for supporting one end of the wrist-pin, said bushing being viewed from its larger end.

45 In the said drawings, A is the cross-head, which consists, principally, of an oblong rectangular metal box, A', provided with upper and lower plates,  $a a'$ , forming the bearing-surfaces of the cross-head. B is the connecting-  
50 rod, and C is the piston-rod, which latter is secured in a hub,  $a^4$ , formed in the partially-

closed end  $a^3$  of the box A'. The said box A' is formed with one open end,  $a^2$ , through which the end of the connecting-rod B enters. The said connecting-rod is, as shown, made with a  
55 "solid" or forged end, or one which is mortised to receive the brasses B', which are held in place by a wedge in the usual manner.

D is the wrist-pin, which is made separate from and detachably secured in the opposite  
60 sides or walls of the box cross-head at one end by means of a conical part,  $d$ , upon one end of the wrist-pin, which is fitted to an inwardly-tapered aperture, as indicated at  $a^5$ , Fig. 4, and at its opposite end by means of a tapered  
65 bushing, E, Figs. 4 and 5, split, as indicated, at  $e$ , Fig. 5, and placed about a cylindric stem,  $d'$ , upon the pin, and fitted to a tapered aperture of the cross-head wall. The wrist-pin is held in place by means of a nut, F, provided,  
70 as shown, with a short screw-stem entering a threaded socket in the smaller end of the wrist-pin and operating to tighten the split bushing upon the pin, and to thereby clamp the latter firmly in place. A washer, G, is preferably placed between the head of the nut and  
75 the bushing.

The construction herein shown and above described, in the cross-head and means for uniting the connecting-rod therewith, is fully  
80 described and claimed in another application for patent, No. 165,915, filed by me on the 18th day of May, 1885, and is not, therefore, herein claimed.

As an improved means of lubricating the  
85 cross-head guides H and H', and the wrist-pin bearing, an oil cup or reservoir, L, is arranged upon the engine-frame K at a point over the path of the cross-head, and oil or other lubricant is conducted from said reservoir to the upper guide, H, through a small  
90 vertical passage,  $l$ , which is formed through the part of the engine-frame forming said guide, and is adapted to permit a slow feed of oil from the reservoir to the bearing-surface  
95 of the upper guide. The upper bearing-surface of the cross-head is provided with longitudinal channels  $h$ , in which the oil is received from the surface of the upper guide in the reciprocatory movement of the cross-head.  
100 The said channels  $h$  extend from the ends of the top surface of the cross-head to the mid-



dle of the same, where they communicate with a vertical passage,  $h'$ , extending through the upper wall of the hollow cross-head to the interior thereof. The said channels  $h$  are made deeper at their inner than at their outer ends, whereby the oil collected therein is caused to flow into said passage  $h'$ . In the particular construction of the parts herein shown said passage  $h'$  is preferably formed by means of a tube, M, secured in an opening,  $h^2$ , formed vertically through the plate  $a'$  and the upper wall of the box  $A'$ . The oil passing through the tube is discharged from the said tube into a funnel, N, carried by the connecting-rod and arranged below the funnel M. From the funnel N, which is situated at a point over the wrist-pin, the oil is conducted to the wrist-pin through a passage,  $a^3$ , connecting with the funnel N, and passing through the connecting-rod and the brasses, so as to lubricate the bearing-surfaces of the latter and the wrist-pin.

In order that a desired quantity of oil should be gathered from the surface of the upper guide in the reciprocatory movement of the cross-head, the channels  $h$  in the upper surface of the cross-head are preferably widened or flared at their outer ends, as indicated at  $h^3$ , so that the oil will be scraped from a portion of the guides of considerable width.

As preferably constructed the narrower portions of the channels  $h$  are arranged out of line with the discharge-orifice  $l$ ; or, in other words, the portions of the channels situated between the passage  $h'$  and the two widened end portions  $h^3$  are formed parallel with each other and at opposite sides of a line running centrally along the cross-head top, so that at all times such narrow portions of the channels are at one and the other side of the oil-passage  $l$ . By this arrangement of the parts at each reciprocation of the cross-head the unchanneled top surface of the cross-head is brought beneath the oil-passage  $l$ , so as to receive a quantity of oil to lubricate the same, which oil is distributed over the surface of the upper guide in the movement of the cross-head.

One of the side walls, as  $h^1$ , of the widened end portions of the channels  $h$  is preferably extended obliquely across the path of the feed-passage, and in position to scrape off the oil which will collect at the discharge-orifice of the oil-passage  $l$  through the upper guide during the short intervals when the cross-head is clear of the said passage. By this means an ample supply of lubricant to the upper guide is insured, while at the same time the other parts to be lubricated will be properly fed, the feed-passage from the oil-cup or reservoir being of course of proper size to give a sufficient supply of oil for all the surfaces to be lubricated.

In order to provide means for lubricating the lower guide,  $H'$ , a passage, P, is formed through the lower wall of the box  $A'$  and the plate  $a'$ , whereby such oil as may pass from the bearings for the wrist-pin and collect in the bottom of the hollow cross-head will be

conducted to the lower guide,  $H'$ . In order to direct the oil to central opening through the bottom of the hollow cross-head, the inner surface of said bottom may be depressed somewhat around this opening, as shown. By this construction it is obvious that the upper and lower guides, and also the wrist pin, may be lubricated from a single oil cup or reservoir located over the lower slide.

Although, as here shown, the oil for the lower slide must first pass over or through the wrist-pin bearings, yet the result of oiling the lower guide from oil fed to the upper one may obviously be obtained by a passage connecting the upper surface of the cross-head with the lower one; or, when the box-form of cross-head is used and the wrist-pin is otherwise located than as herein shown, oil may drop from the passage  $h'$  directly to the passage P.

In the particular construction of the parts herein shown, also, a separate oil-passage for supplying the lower guide may be formed in the top of the cross-head, and such passage may be so arranged that the oil may drip from it to the bottom of the box  $A'$  without encountering the end of the connecting-rod, or a tube may be used connecting the said separate passage with the exit-passage at the bottom of the cross-head.

The latter construction is illustrated in dotted lines in Figs. 1 and 2, in which one of the passages  $h$  in the top of the slide is shown as communicating with a passage shown in dotted lines at  $h^3$ , Figs. 2 and 3, which passage is connected by means of a tube (indicated at  $h^4$  by dotted lines) with the passage P.

Inasmuch as a construction in cross-heads whereby lubricant is conveyed from the upper to the lower guide through a passage or passages in said cross-head is novel with me, I desire to claim, broadly, a cross-head provided with such passage or passages, whether used in the particular form of the cross-head herein shown or in cross-heads of other forms.

The lower guide may be provided at its ends with the usual recesses or pockets, one of which is shown at O, Fig. 1, in which the surplus oil from the lower slide is received.

I claim as my invention—

1. The combination, with the cross-head guides and connecting-rod of an engine, and means for feeding a lubricant to the upper guide, of a cross-head provided with a passage adapted to convey the lubricant from the upper guide to the bearing-surfaces of the pivotal joint between the said cross-head and rod, substantially as described.

2. The combination, with the cross-head guides of an engine, and means for feeding a lubricant to the upper guide, of a cross-head constructed with a passage to convey the lubricant from the upper to the lower guide, substantially as described.

3. The combination, with the cross-head guides of an engine, and means for feeding a lubricant to the upper guide, of a cross-head provided in its upper bearing-surface with a



channel adapted to collect lubricant fed to the upper cross-head guide and connecting with a feed-passage leading to other parts to be lubricated, substantially as described.

5 4. The combination, with the cross-head guides and connecting-rod of an engine, and means for feeding a lubricant to the upper guide, of a hollow cross-head adapted to receive the end of the connecting-rod, and provided with a passage, *h'*, for conveying lubricant from the upper guide to the interior of the cross-head, said connecting-rod being provided with a funnel communicating with the bearing-surfaces of the pivotal joint between  
10 the rod and cross-head, substantially as and for the purpose set forth.

5 5. The combination, with the cross-head guides and connecting-rod of an engine, and means for feeding a lubricant to the upper  
20 guide, of a hollow cross-head adapted to receive the end of the connecting-rod, and pro-

vided with a passage, *h'*, in its top to convey the lubricant from the upper guide to the interior of the cross-head, and with a passage, *P*, in its bottom for the passage of lubricant  
25 to the lower guide, substantially as described.

6. The combination, with the cross-head guides of an engine, of the hollow cross-head *A*, a connecting-rod, *B*, provided with a funnel, *N*, communicating with the bearing-surfaces of the pivotal joint between the cross-head and rod, and a depending tube, *M*, located in the said cross-head over the said funnel, substantially as and for the purpose set forth.  
30

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

ALBERT L. IDE.

Witnesses:

JAMES C. CONKLING,  
CLINTON L. CONKLING.