

(No Model.)

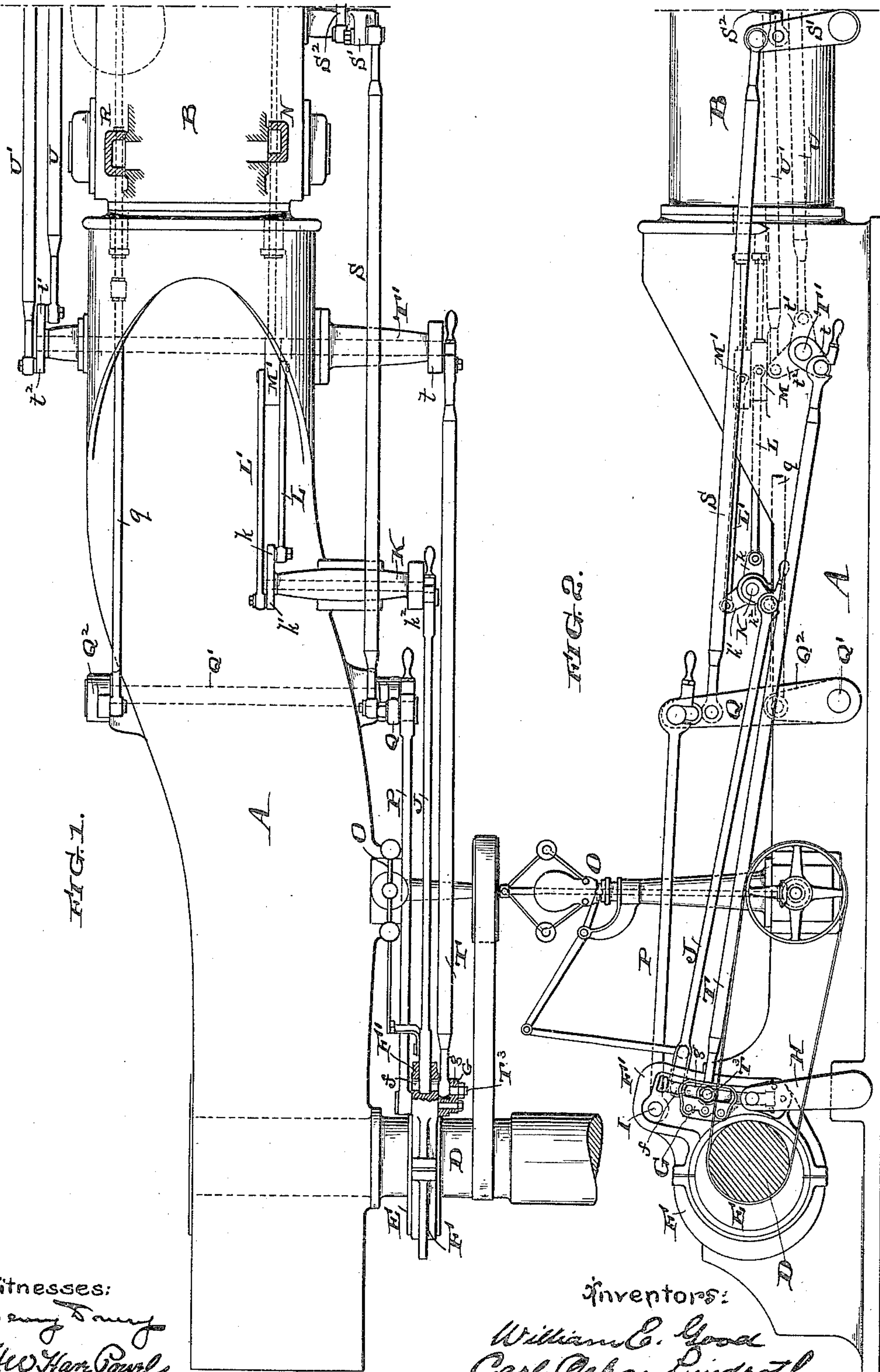
3 Sheets—Sheet 1.

W. E. GOOD & C. O. LINDROTH.

LINK MOTION FOR COMPOUND ENGINES.

No. 446,444.

Patented Feb. 17, 1891.



Witnesses:
Henry D. ...
H. W. ...

Inventors:
William E. Good
Carl Oscar Lindroth
by their atty.
Francis J. Chambers

(No Model.)

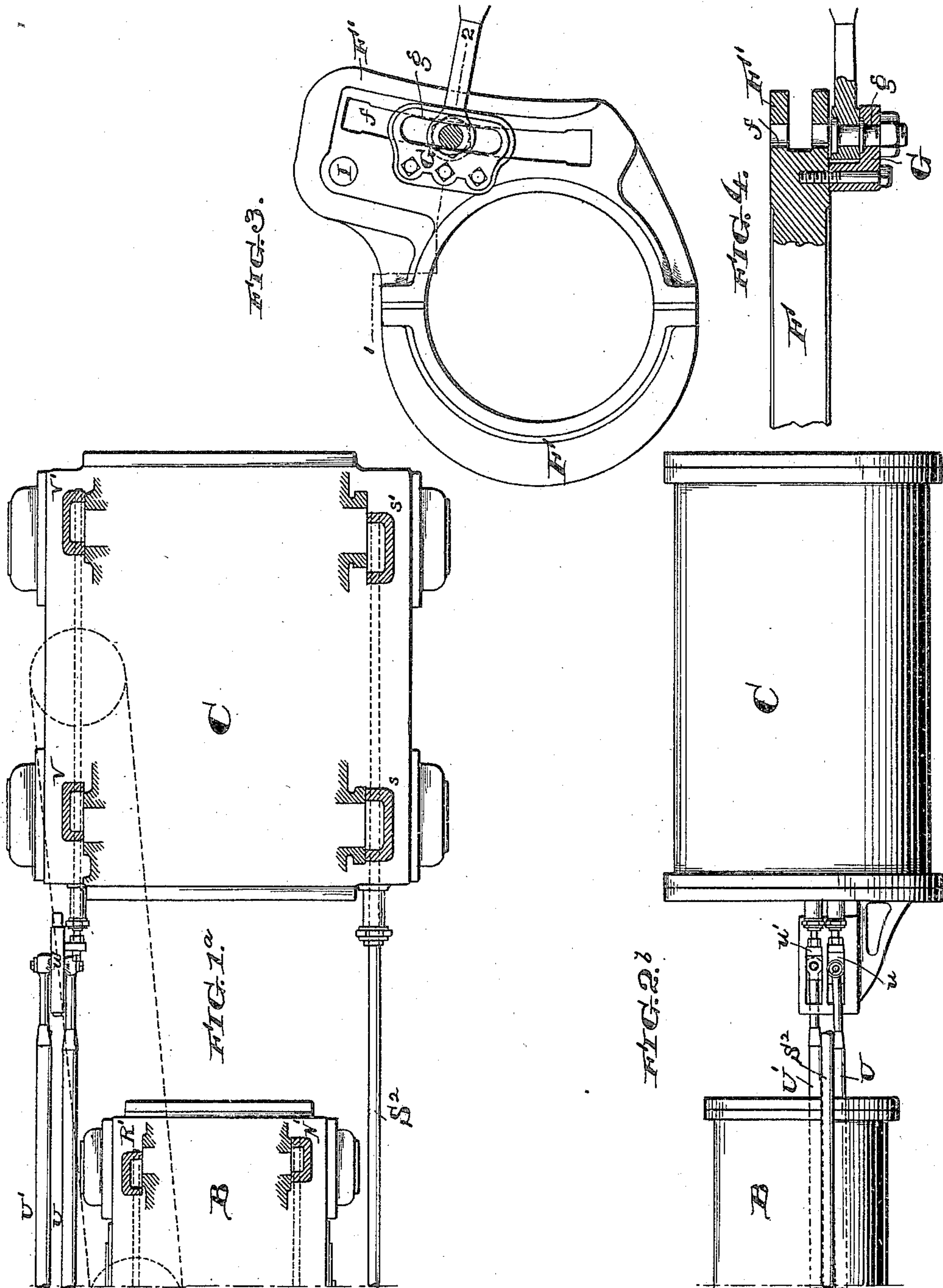
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Witnesses:

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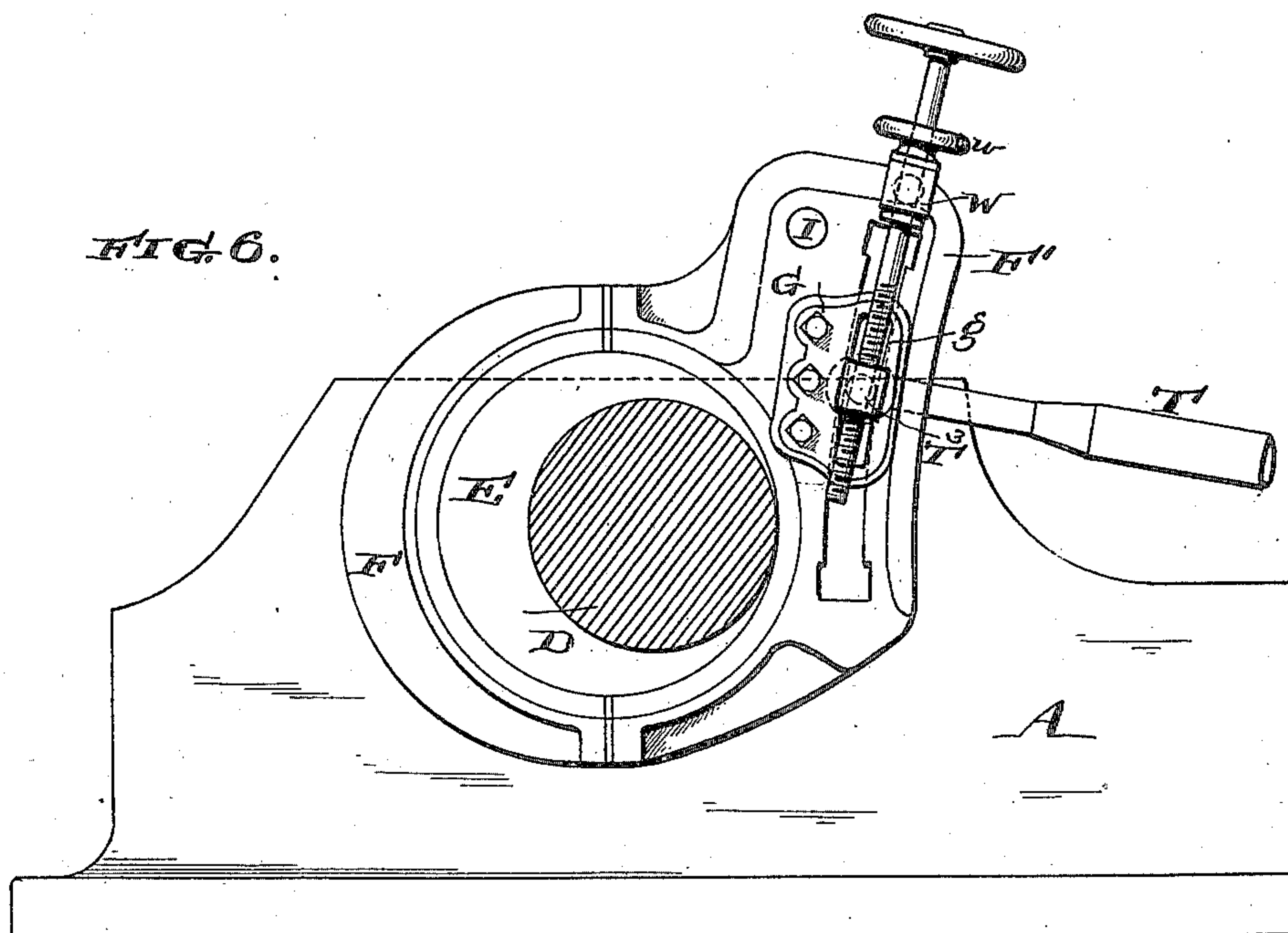
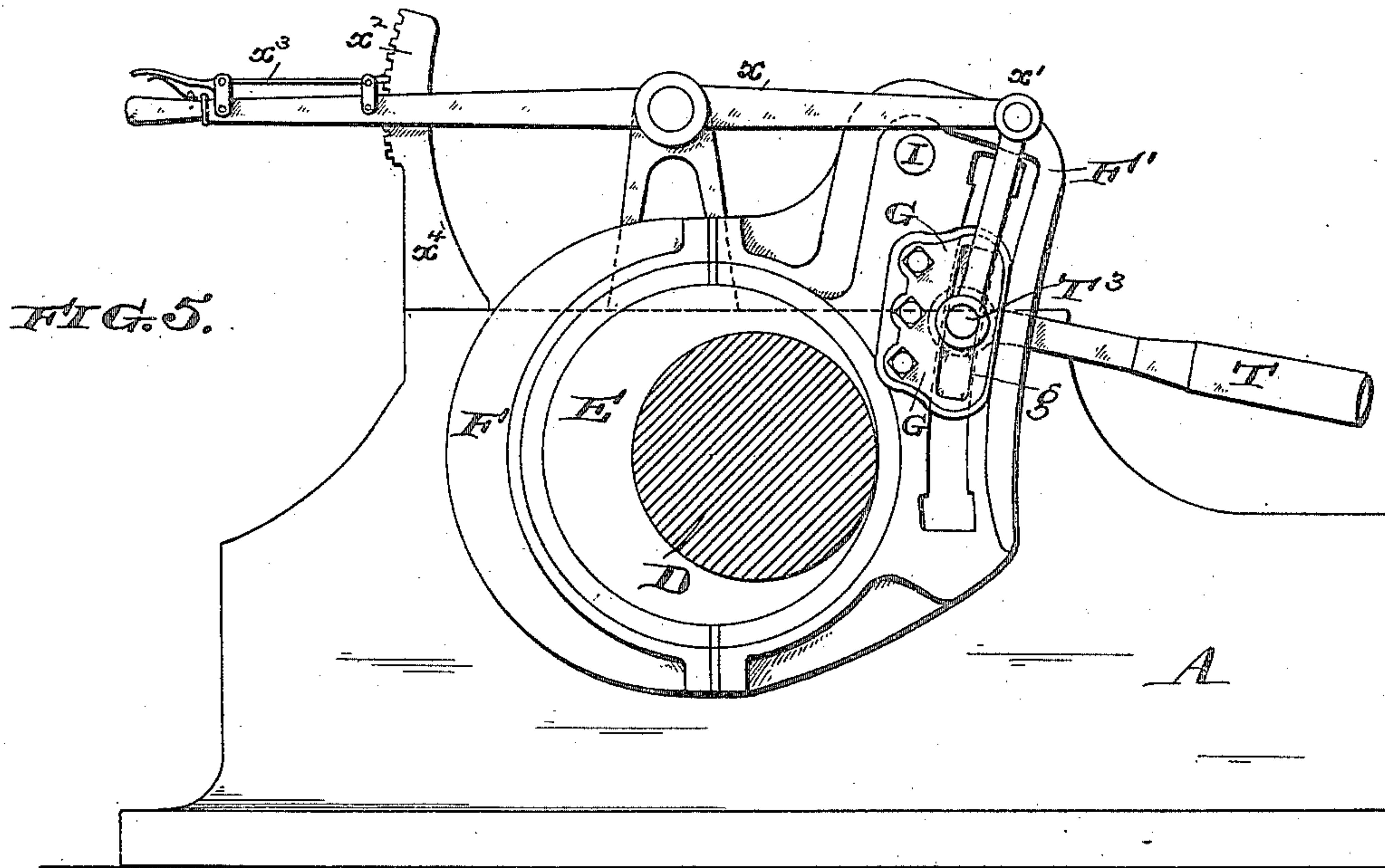
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UNITED STATES PATENT OFFICE.

WILLIAM E. GOOD AND CARL O. LINDROTH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO THE SOUTHWARK FOUNDRY AND MACHINE COMPANY, OF SAME PLACE.

LINK-MOTION FOR COMPOUND ENGINES.

SPECIFICATION forming part of Letters Patent No. 446,444, dated February 17, 1891.

Application filed November 20, 1890. Serial No. 371,984. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM E. GOOD and CARL OSKAR LINDROTH, both of the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and useful Improved Link-Motion for Compound Engines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to an improvement in valve-actuating links of the kind generally known as the "Pius Fink link," and by which they are adapted for use with compound engines, our object being to adapt the link so that it will actuate the admission and exhaust valves of both the high and low-pressure cylinder.

The nature of our improvement will be best understood as described in connection with the drawings, in which it is illustrated in connection with a compound engine of the Porter Allen type, and in which—

Figures 1 and 1^a make up together a plan view of the engine; Figs. 2 and 2^b, a side elevation thereof; Fig. 3, an enlarged elevation of the link; Fig. 4, a section through the link and attachments on the line 1 2 of Fig. 3; and Figs. 5 and 6 are plan views illustrating two modifications in mechanism for adjusting in the link the rod which actuates the admission-valves of the low-pressure cylinder.

A is the bed-plate of the engine; B, the high-pressure cylinder; C, the low-pressure cylinder.

D is the main shaft of the engine; E, an eccentric situated thereon; F and F', the well-known Pius Fink link, combining the eccentric-strap F and the slotted link F'. *f* is the slot in the said link, in which the rod which actuates the admission-valves of the high-pressure cylinder is secured.

H is the usual guide-link, pivoted to the bed-plate at one end and in the slot *f* at the other end.

In addition to the usual slot *f* we provide in or in connection with the slotted link F F' an independent supplemental slot *g*, in which is secured the end of the rod T, which actuates the admission-valves of the low-pressure cylinder. As shown in the drawings, and as preferably constructed, the supplemental slot *g* is formed in a plate G, which is bolted to the link F F', as shown, so that the slot *g* shall lie substantially in line with the slot *f*.

I is a pin secured to the link F F', as shown, and to which pin is secured the rod P, which actuates the exhaust-valves of both cylinders.

The mechanism shown in the drawings, by which the motion of the rods J, T, and P is communicated to the different valves which they actuate, is that which I have found well adapted for use in connection with the style of engine illustrated, but may of course be modified in many respects. As shown, the rod J is secured to an arm *k*² of a rock-shaft K, upon which shaft are also secured arms *k* and *k'*, which arms actuate, as shown, the connecting-rods L and L', which, acting through the slides M and M', communicate motion to the inlet-valves N and N' of the high-pressure cylinder B. The desired variation in the cut-off is effected in the usual way by means of a governor O, which changes the position of the pivoted end of rod J.

Referring next to the rod T, it will be necessary that it connects with an arm *t* of a rock-shaft T', upon which rock-shaft are also secured the arms *t'* and *t*², which actuate, respectively, the connecting-rods U and U', the other ends of which connect with the slide *u* and *u'*, which in turn, by means of rods extending into the valve-chest, actuate the inlet-valves V and V' of the low-pressure cylinder. The rod P is arranged, as shown, to actuate the exhaust-valves of both cylinders. It is connected to the pin I on the link F F' and to the arm Q of rock-shaft Q', from which shaft also extends another arm Q². From the said arm Q² a connecting-arm communicates motion to the exhaust-valves R and R' of the high-pressure cylinder. Connecting with a second pivot, as shown, of the arm Q, a connecting-rod S communicates motion to a rocking arm S', to which arm is also secured the connecting-rod S², which connects with and actuates the outlet-valves *s* and *s'* of the low-pressure cylinder.

We have found that it is not necessary or advisable to change the stroke of the admission-valves of the low-pressure cylinder during the ordinary normal running of the engine. It is only necessary, therefore, to make an adjustable connection of the end T^3 of rod T in the slot g . This may be done in any convenient way, as by a clamping-nut, but more conveniently by constructions such as are shown in Figs. 5 and 6.

In Fig. 5 the adjustment of the end of rod T in the slot g is effected by a lever X, connecting with rod T at one end by means of a rod X' , and having a catch X^3 at its handle end, by which the lever X can be adjusted in any desired position with respect to a segment X^2 , supported on a standard X^4 .

In Fig. 6 the end of rod T is made adjustable by means of a screw W, supported at the upper part of the link F' , and by turning which the end of rod T is elevated or depressed in the slot g .

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In combination with a compound engine, a link, as $F F'$, having a slot f , and a supple-

mental slot g , as described, a rod J, automatically adjustable in slot f and arranged to actuate the admission-valves of the high-pressure cylinder, a rod T, adjustable in slot g and arranged to actuate the admission-valves of the low-pressure cylinder, and a rod or rods P, also connected with link $F F'$ and arranged to actuate the exhaust-valves of the cylinders.

2. In combination with a compound engine, a link, as $F F'$, having a slot f , and a supplemental slot g , as described, a rod J, automatically adjustable in slot f and arranged to actuate the admission-valves of the high-pressure cylinder, a rod T, adjustable in slot g and arranged to actuate the admission-valves of the low-pressure cylinder, means for adjusting rod T in slot g , as described, and a rod or rods P, also connected with link $F F'$ and arranged to actuate the exhaust-valves of the cylinders.

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