

J. S. Barden,

Steam-Engine Attachment,

N^o 34,400,

Patented Feb. 18, 1862.

Fig. 5.

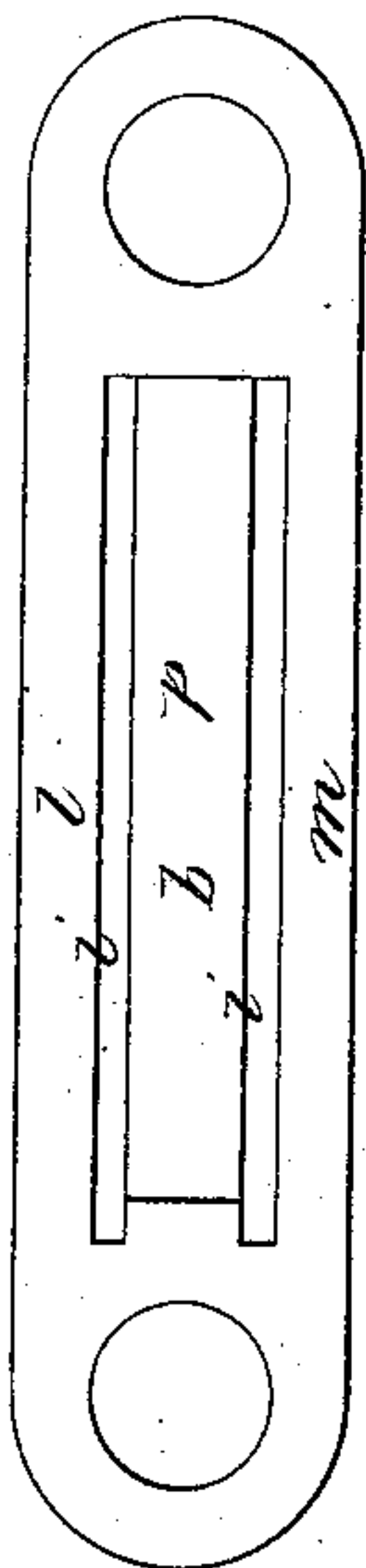


Fig. 2.

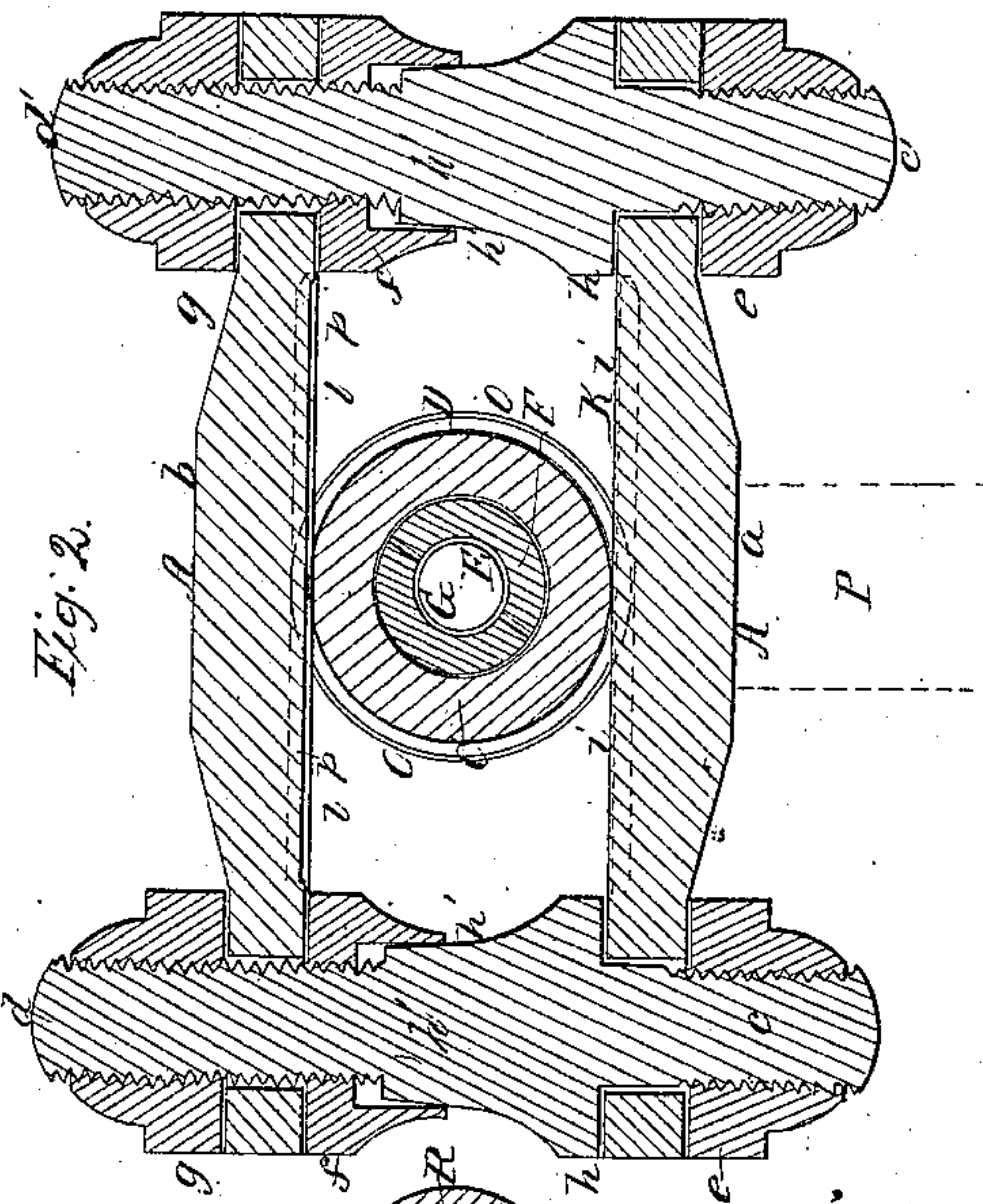


Fig. 3.

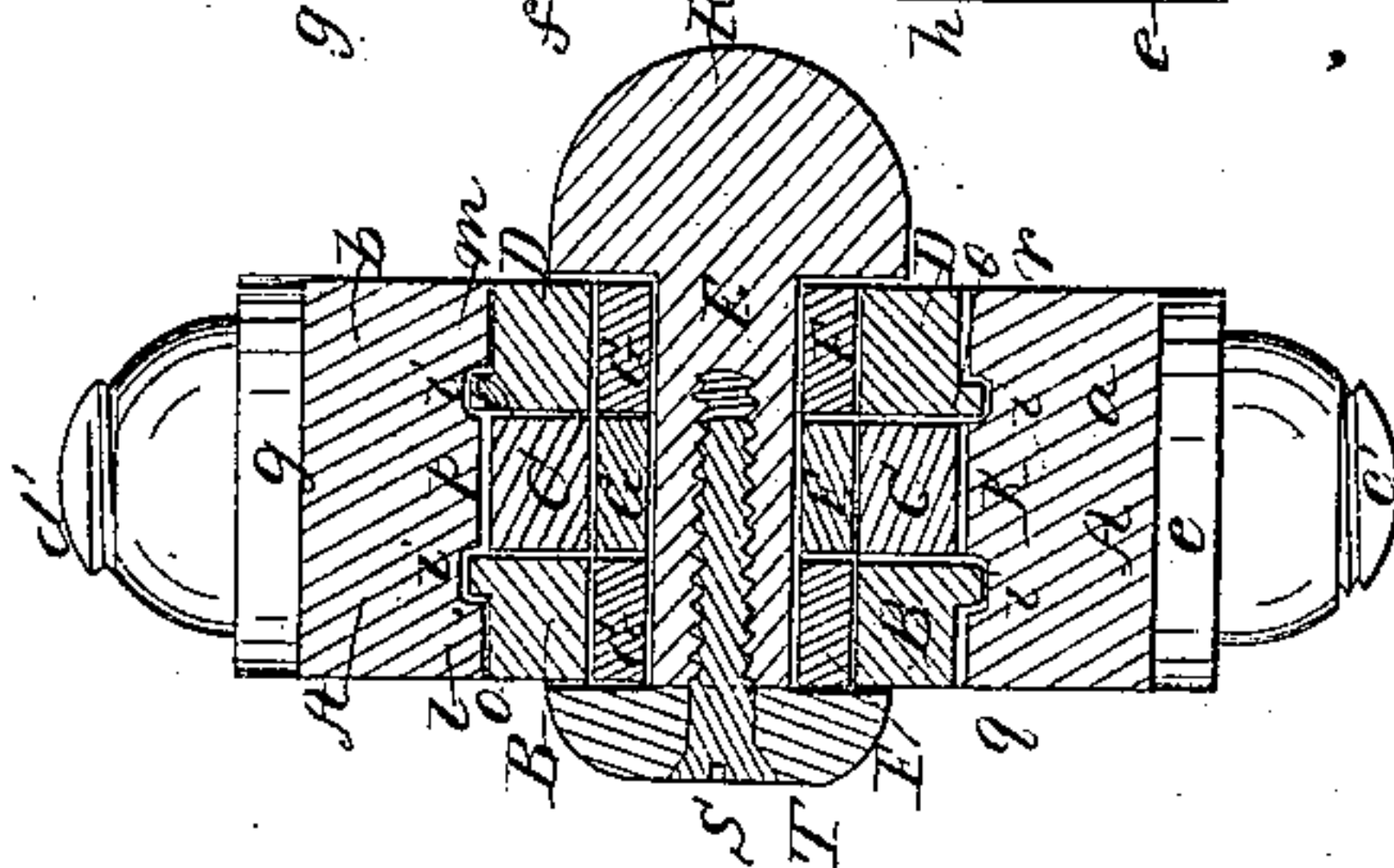


Fig. 4.

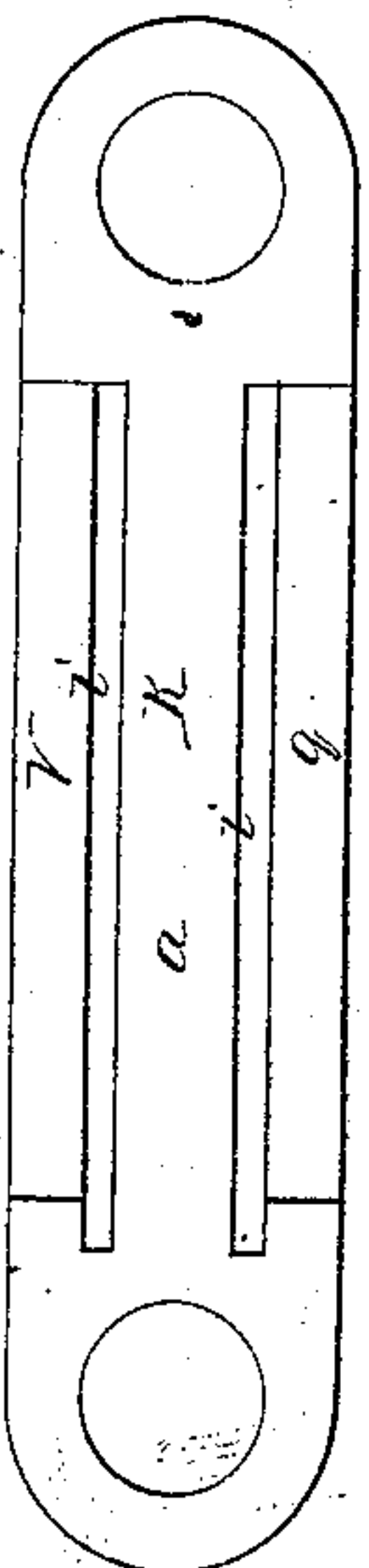
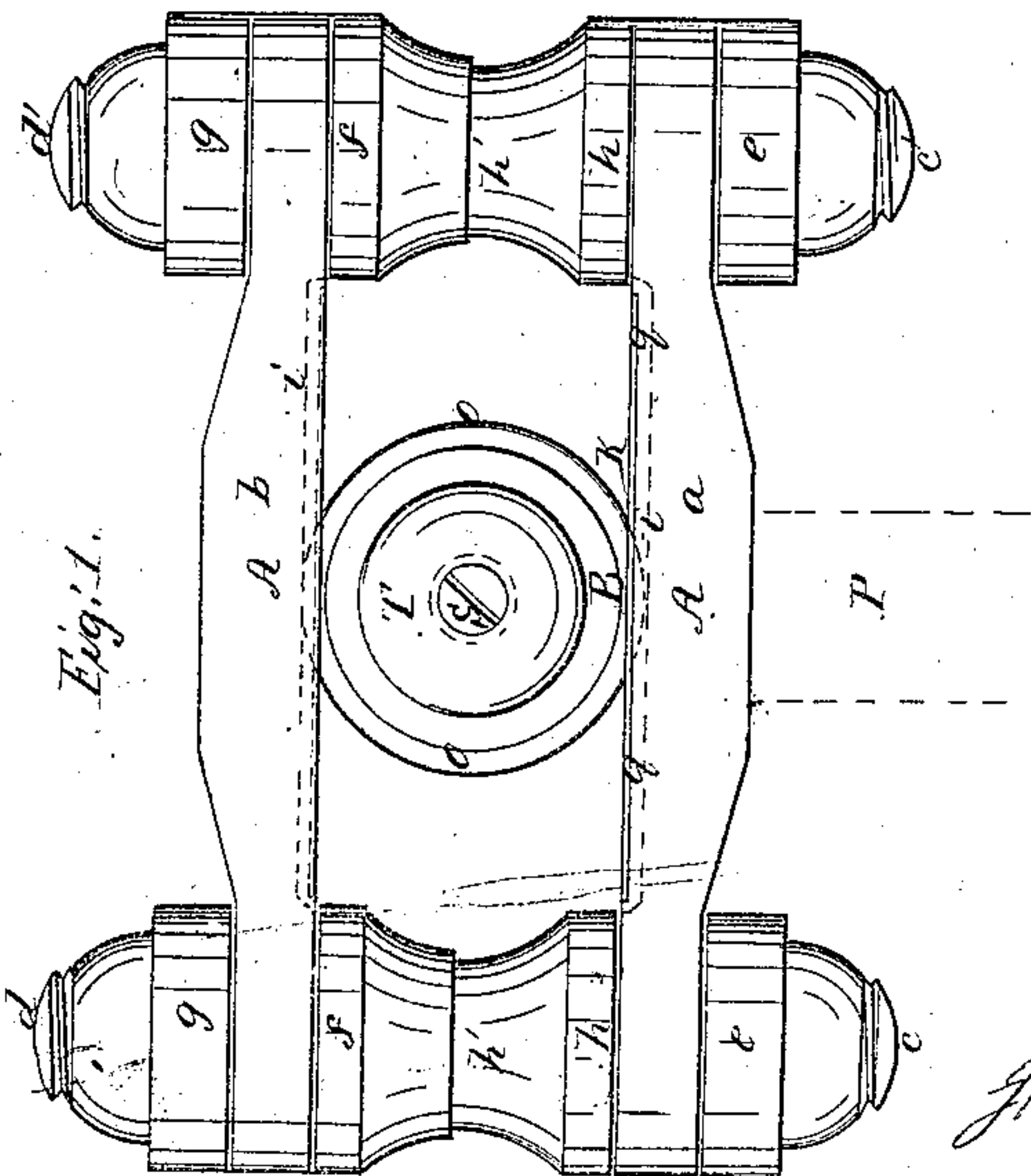


Fig. 1.



Witnesses,

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UNITED STATES PATENT OFFICE.

JOHN S. BARDEN, OF NEW HAVEN, CONNECTICUT.

CRANK AND CROSS-HEAD CONNECTION FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 34,400, dated February 18, 1862.

To all whom it may concern:

Be it known that I, JOHN S. BARDEN, a citizen of the United States of America, and a resident of the city and county of New Haven, of the State of Connecticut, have invented a new and useful or Improved Crank and Cross-Head Connection for Steam-Engines or Various other Machinery; and I do hereby declare the same to be fully described in the following specification and illustrated in the accompanying drawings, of which—

Figure 1 is a side view, Fig. 2 a longitudinal section, and Fig. 3 a transverse section, of my device.

The object of my invention is to enable the piston-rod of a stationary cylinder of a steam-engine to be applied to a crank of the driving-shaft without the intervention of a connecting-rod such as is commonly employed. For this purpose I make use not only of a cross-head composed of two parallel grooved bars, but of three rollers, two of which are provided with flanges to extend into the two grooves of each of the said bars, the whole being constructed in manner and so as to operate substantially as hereinafter described.

In the drawings, A is the cross-head or rail-frame, composed of two bars *a b* and two connection-screws *c d c' d'*, each two of which are furnished with three nuts *e f g* and one shoulder *h*, as shown in the drawings. The middle nuts *f f* are made with cylindrical sockets to receive corresponding extensions *h' h'* from the shoulders and make a good finish, as shown in Fig. 1. The screws extend through the two bars *a b*, one of such bars being made to rest against the two shoulders, while the other is supported against the two interior nuts *f f*, these latter serving with their screws to adjust the distance of the two bars apart from one another. The other nuts with their screws operate to confine the bars in place when once adjusted. Each bar is constructed with two grooves *i i*, running lengthwise of it and on its inner surface, as shown in Figs. 4 and 5, which are respectively inner side views of the said bars. Furthermore, the lower bar between its grooves is provided with a bearing surface or rail *k*. The upper bar, however, has two such bearing surfaces or rails *l m*, which are placed outside of the grooves.

The frame A when in use is to be affixed to the end of a piston-rod and with respect to such as seen in the drawings, where the said rod is exhibited at P by dotted lines. Between the said two bars are three rollers B C D, two of which—viz., those marked B and D, and which have the other roller C between them—are furnished with flanges *o o* to extend into the grooves of the bars *a b*, as shown in the drawings. The middle roller C is plain or without any flange and bears against the rail *k*, but does not touch the surface *p*, which is immediately between the two rails *l m*, without touching the surfaces *q r*, which are opposite to them and on the lowermost bar. The axes of all three of the rollers are to be in one straight line, each of the rollers being bored, so as to receive a crank wrist or neck E and two semi-tubes F G, which are arranged within the rollers and on the neck E, as shown in Figs. 2 and 3. The rollers and the movable parts or semi-tubes F G of each one of them are confined on the crank-neck by means not only of a shoulder R, but by a screw *s*, acting against a washer T, the whole being arranged as exhibited in Fig. 3. The purpose of the movable parts F G is to enable the rollers to be passed over one of the arms or thicker portions of a bell-crank when necessary in order to apply the rollers to the neck of such crank. To accomplish this the parts F G are first to be removed from their sockets in the rollers. The sockets being large enough, the rollers are to be simultaneously slipped over the crank-arm and upon the semi-tubular parts F G previously applied to the crank wrist or neck. The flanges of the two external rollers serve to keep the cross-head frame A in proper engagement with the crank. During one half of each revolution of the crank the middle roller will bear and run against its rail *k*, the other rollers in the meantime not revolving. During the next half-revolution of the crank the other rollers will work against their rails, the middle roller in the meantime not revolving. This results from the peculiar arrangement of the rollers and their three bearing-rails *k l m*, such arrangement being as exhibited in the drawings. Each roller operates with one rail only, and thus it will be free to revolve in its turn

on the crank-wrist, and so as to obviate much of the friction which would ensue were the crank-wrist to work in a slot unprovided with such rollers.

I claim—

1. The combination and arrangement of the flanges *o o*, grooves *i i*, and rail-bearings *k l m* with the three friction-rollers and the cross-head A, the whole being applied to a crank

and a piston-rod and to operate substantially as set forth.

2. The combination of the semi-tubes F G with the rollers, when applied, and to operate within a rail-frame A, as described.

JOHN S. BARDEN.

Witnesses:

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