(No Model.)

T. T. PROSSER.

STEAM BRAKE.

No. 413,631. Patented Oct. 22, 1889.

Fig. 3.

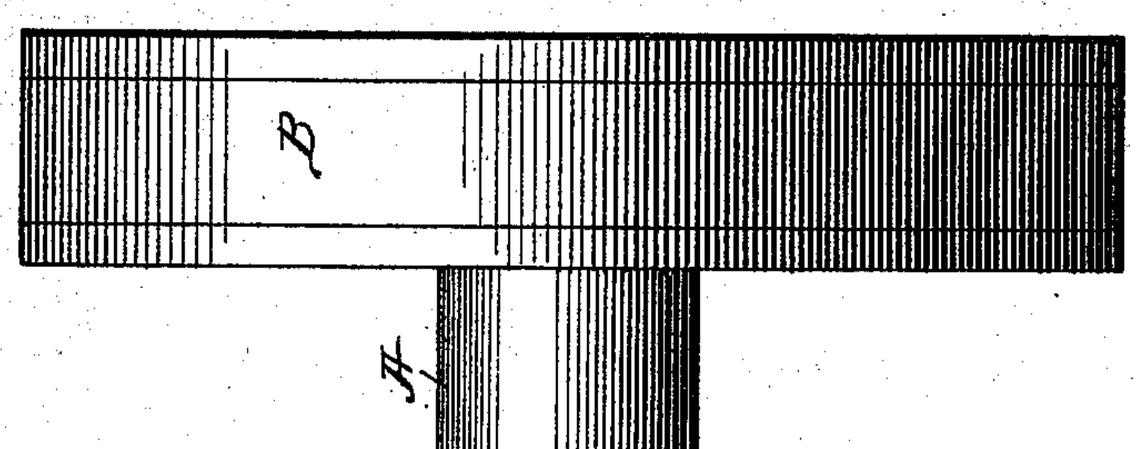


Fig. 2.

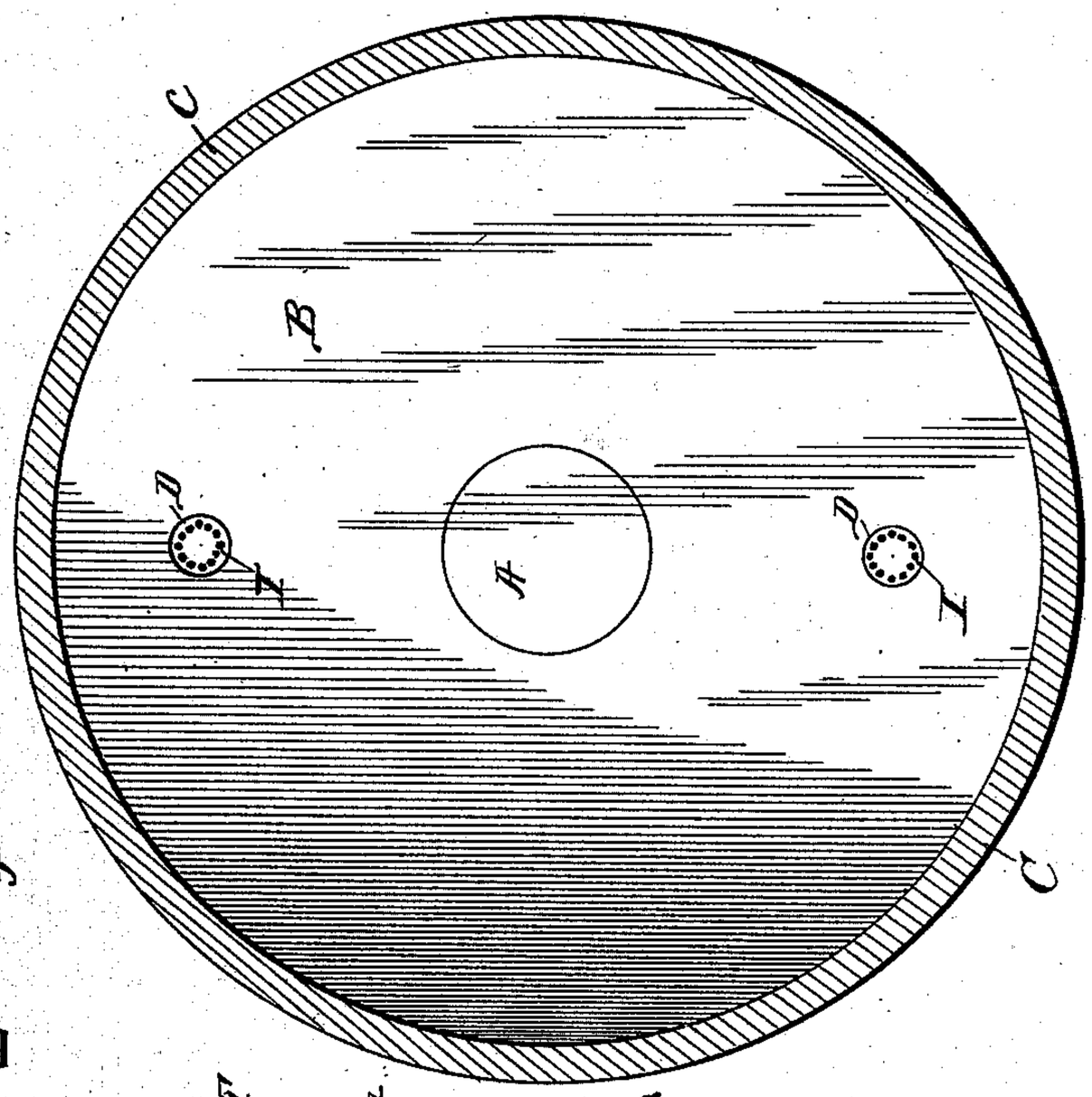


Fig. 4.

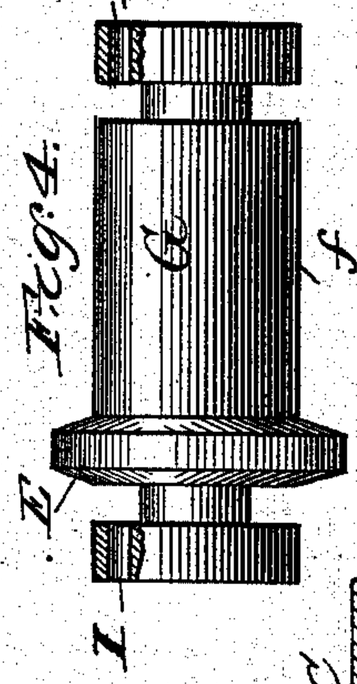
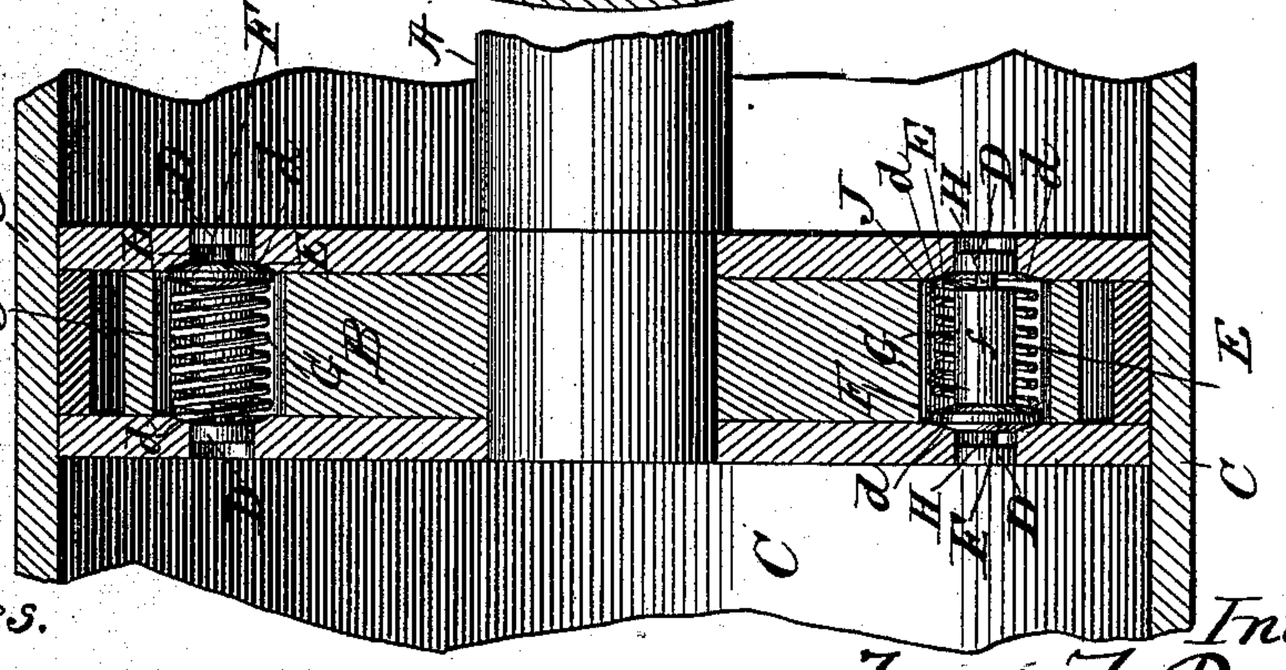


Fig. 1.



Witnesses.

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Flora L. Brown.

Inventor:

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UNITED STATES PATENT OFFICE.

TREAT T. PROSSER, OF LAKE SIDE, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO HIMSELF, ALLEN A. GRIFFITH, JR., AND FRANK SAYRE OSBORNE.

STEAM-BRAKE.

SPECIFICATION forming part of Letters Patent No. 413,631, dated October 22, 1889.

Application filed March 5, 1889. Serial No. 302,029. (No model.)

To all whom it may concern:

Be it known that I, TREAT T. PROSSER, a citizen of the United States, residing at Lake Side, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Steam-Brakes, of which the following is a full and complete description.

My invention relates to brakes for motors wherein rotation of a driving-shaft is obtained by suitably connecting to a crank thereon a piston-rod having on one end a piston-head inclosed in a cylinder, reciprocatory motion being imparted to said piston-head by the alternate admission and liberation of steam or other fluid on one and the other side thereof in said cylinder; and the purpose of my invention is to obtain a device whereby the rotation of said shaft so connected to said piston-rod may be stopped by the admission of steam in said cylinder on the driven side of said piston-head without danger of forcing outward the head of said cylinder when by the rotation of said shaft the said piston-head is forced against the steam so injected into or contained within said cylinder and compressed thereby; and I accomplish these results by the mechanism illustrated in the drawings accompanying and forming a part of this specification, in which—

Figure 1 is a vertical central section. Fig. 2 is a face view. Fig. 3 is a side elevation of my invention, and Fig. 4 is a detail of the valve used by me in my invention.

Like letters refer to like parts throughout the several views.

A is a piston-rod attached by an ordinary connection-rod to a crank-shaft. B is a piston-head. C is a cylinder.

Where two piston-rods are attached to a crank-shaft, as is usually done, by suitable connecting-rods, one of said cranks extending out from said crank-shaft at an angle of ninety degrees from the other of said cranks, the said piston-rods with the piston-heads thereon and the cylinders within which said piston-heads reciprocate are duplicates the one of the other, and in order to thoroughly understand my invention, therefore, it is necessary to describe but one thereof.

D D are holes extending through the face-plate of piston-head B toward and to hole E, which extends through the central part of said piston-head.

F is a valve in hole E. Hole E is of somewhat larger diameter than are holes D, and also of larger diameter than valve F. The inner end of hole D forms the seat *d* of valve F, and may be slightly beveled, if desired.

G is the stem of valve F, and is of the same diameter as are holes D D.

H H are grooves extending around valve-stem G, one at each end thereof; and I I are small holes in stem G, extending from the face of said stem in to groove H.

J is a spring placed on stem G of valve F. One end of spring J presses against one of the valve-seats *d* and the other end thereof presses against the inner side of valve F, thereby holding said valve against seat *d* with a force determined by said spring, but greater than the pressure against the valve, tending to open it by the steam actuating the motor in the ordinary operation thereof.

It will be observed that by the construction of valve F and stem G thereof when steam is admitted to the cylinder C at either end thereof, such steam may pass through holes I I in valve-stem G and to valve F, where it is prevented from passing farther by said valve, so held, as described, against seat *d* by spring J, while at the same time the said stem G, or that portion thereof in holes D D, serves as a guide for said valve and stem.

In one of the holes E in piston-head B this valve F, stem G, and spring J are so arranged that if steam be admitted to one end of the cylinder and against one of the faces of said piston-head it passes through holes I I into groove H at one end of the valve-stem G and against valve F, and when from any cause such steam exerts greater pressure on said valve F and the end of its valve-stem G than spring J can resist the valve will be forced back from its seat, and the steam passing around said valve into groove H at the other end of the valve-stem passes through holes I I to the other side of the piston-head. In the other of said holes E in piston-head B valve

F and its stem G are so placed that steam exerting a sufficient pressure thereon and on the other face of said piston-head may pass in like manner in the other direction through said piston-head.

By the construction of the piston-head and the valves placed therein as described, it will be readily seen, if steam (or other fluid) is within said cylinder upon one side of the piston-head, and the said piston-head be moved against said steam by the rotation of the crank-shaft, thereby compressing said steam so contained in said cylinder, when the same is so compressed that the tendency thereof to move valve F and stem G back from seat *d* is greater than the pressure exerted by spring G tending to hold said valve in place against its seat, a way will be opened through such piston-head to the other end of the cylinder for such steam, and hence a pressure in said cylinder against either side of said piston-head or against either ends of said cylinder greater than that required to force said valve F back from its seat cannot be secured either accidentally or willfully.

When my invention is used as a brake, the admission of steam into the cylinder is "reversed," as it is termed, and the steam contained in said cylinder may be, and at times is, compressed by the movement of the piston-head actuated by the crank-shaft, so that said steam exerts a pressure greatly in excess of the ordinary pressure of the steam employed in actuating the said piston and its connecting parts. For this reason, as piston-heads are ordinarily constructed and without my device contained therein, the reversal of the steam in the cylinder is attended with greater or less danger of blowing out the cylinder-heads. By the use of my device, however, I may safely reverse steam in said cylinder for braking said crank-shaft.

Incidentally, it will be observed that in the actuating of the crank-shaft by the admission of steam into the cylinder behind the piston it is impossible with my device to obtain a pressure upon said cylinder-head or said piston greater than desired and determined by the pressure of spring F holding valve F on its seat.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In the piston-head of a fluid-motor, the combination of a valve placed in said piston-head in a hole therein of larger diameter than said valve, a stem on said valve moving freely in a hole extending from said first-named hole to the face of said piston-head, said valve-stem having therein ways extending from the face thereof to a groove in front of the valve thereon, and a spring holding said valve against the seat thereof, all substantially as described.

2. In the piston-head of a fluid-motor, the combination of valve F, stem G, having holes I therein and grooves H thereon, valve-seat *d*, and spring J, whereby, when the pressure of said fluid against said valve and stem actuates said spring, such fluid may pass through said piston-head, all substantially as described.

TREAT T. PROSSER.

In presence of—
ALLEN A. GRIFFITH,
JAMES H. DAVIDSON.