

(No Model.)

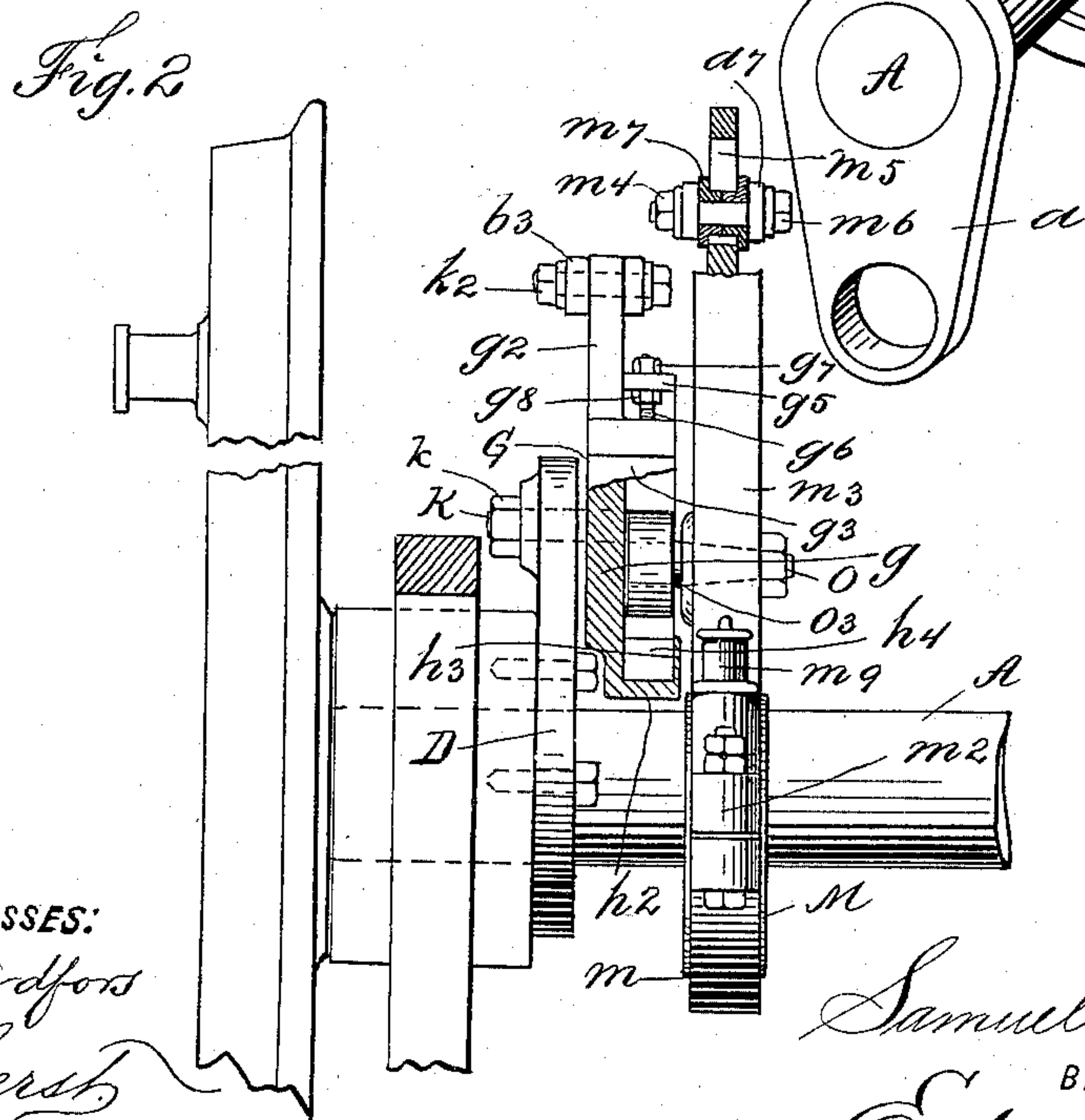
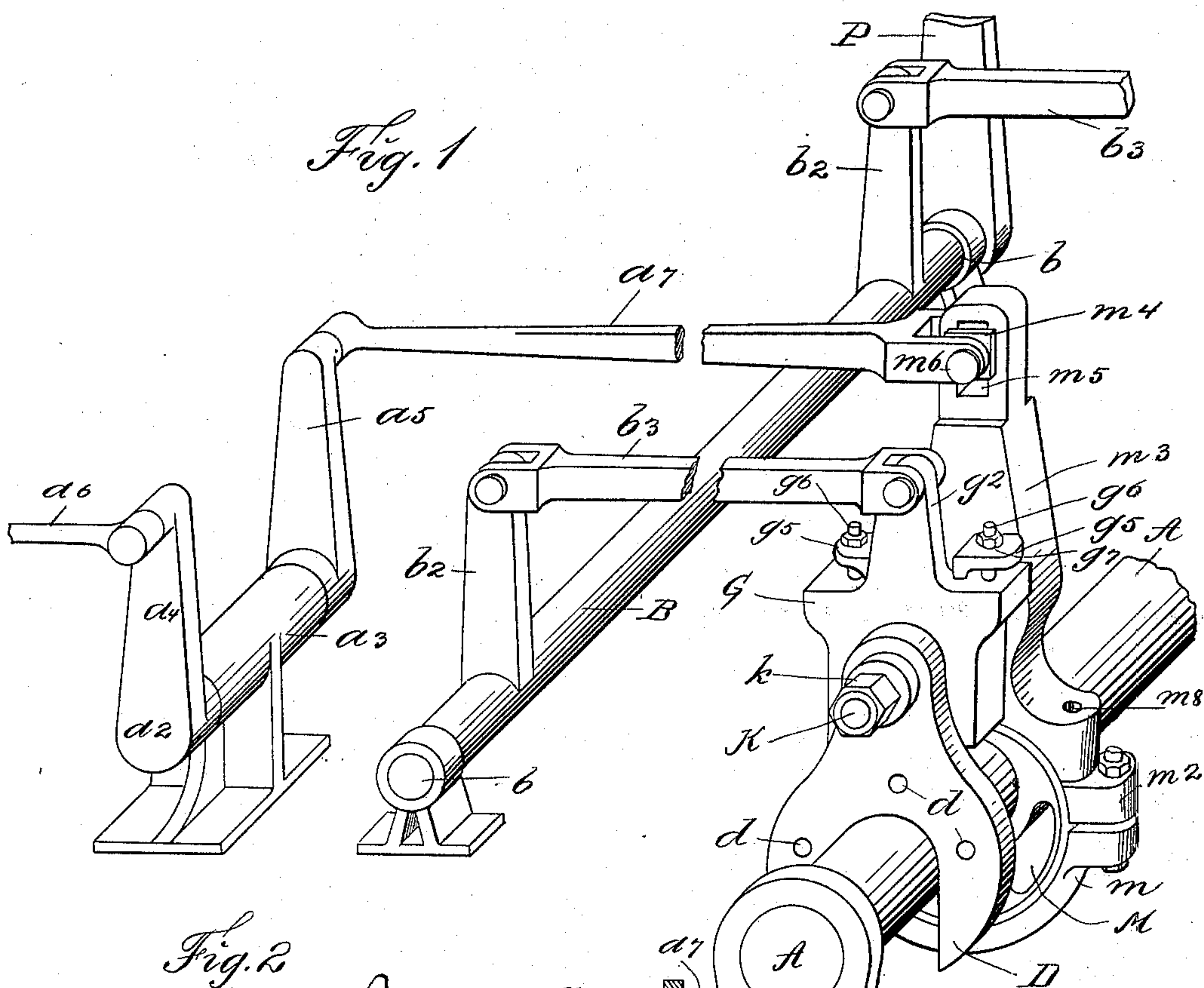
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S. A. HINTON.

STEAM VALVE FOR LOCOMOTIVES OR OTHER ENGINES.

No. 605,282.

Patented June 7, 1898.



WITNESSES:

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C. Gerst.

INVENTOR

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Samuel A. Hinton.

BY

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ATTORNEYS

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

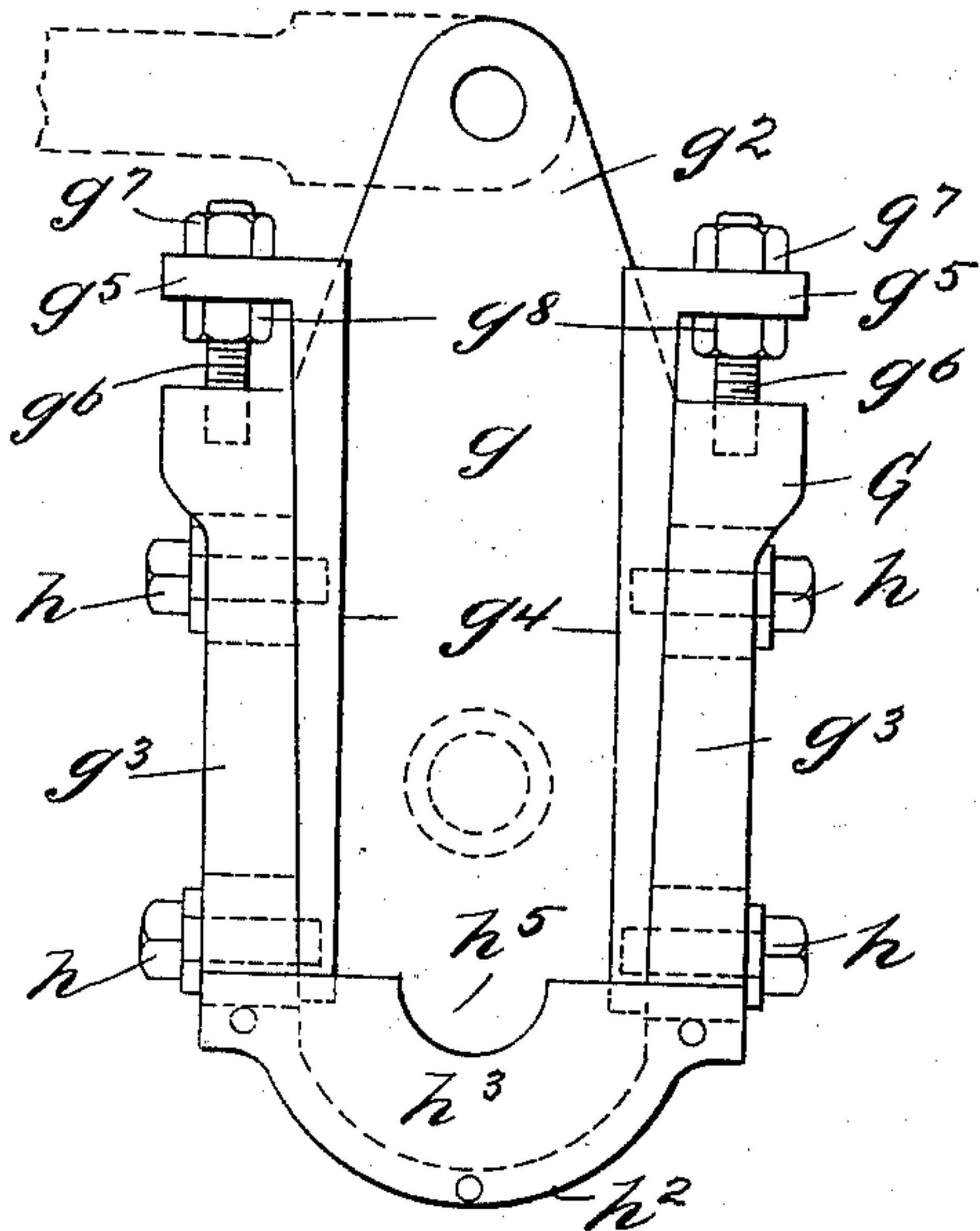


Fig. 4

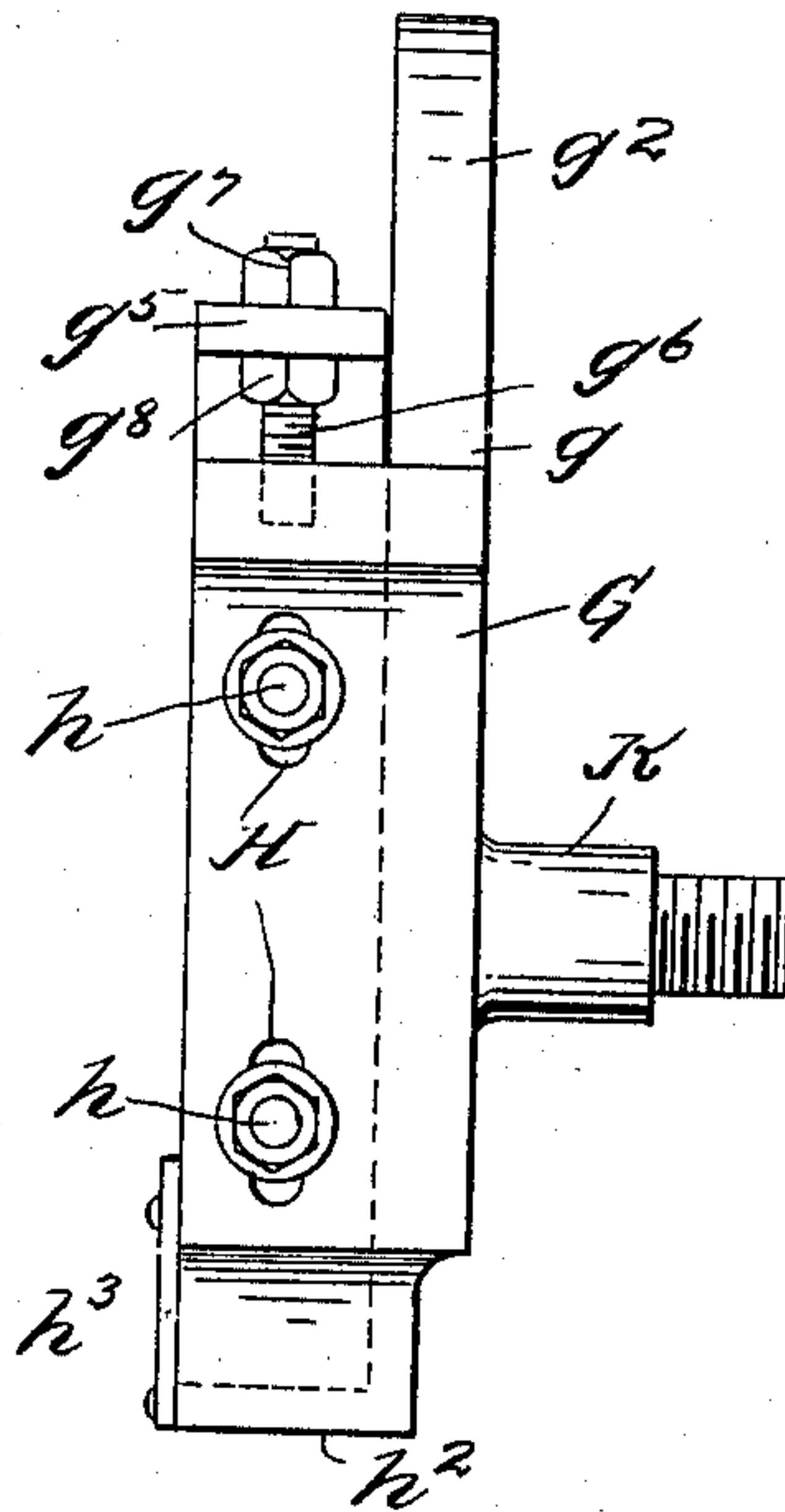


Fig. 5.

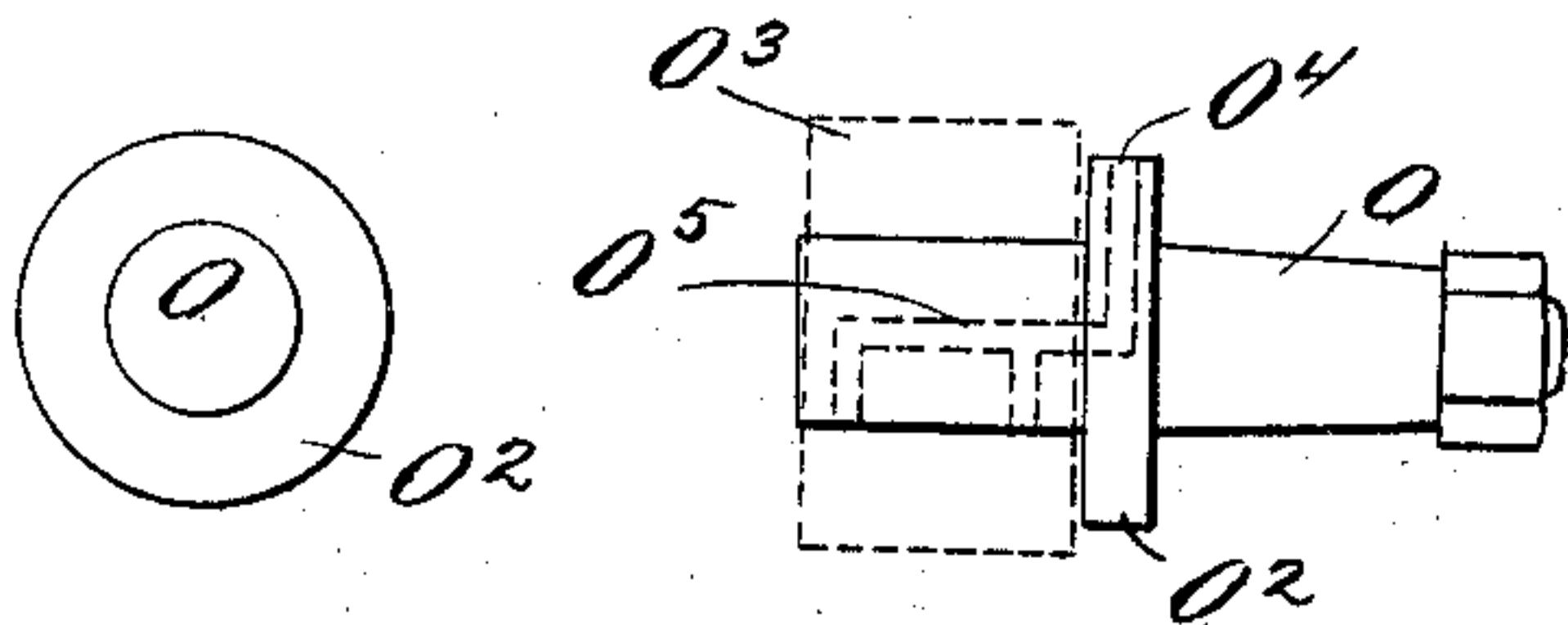
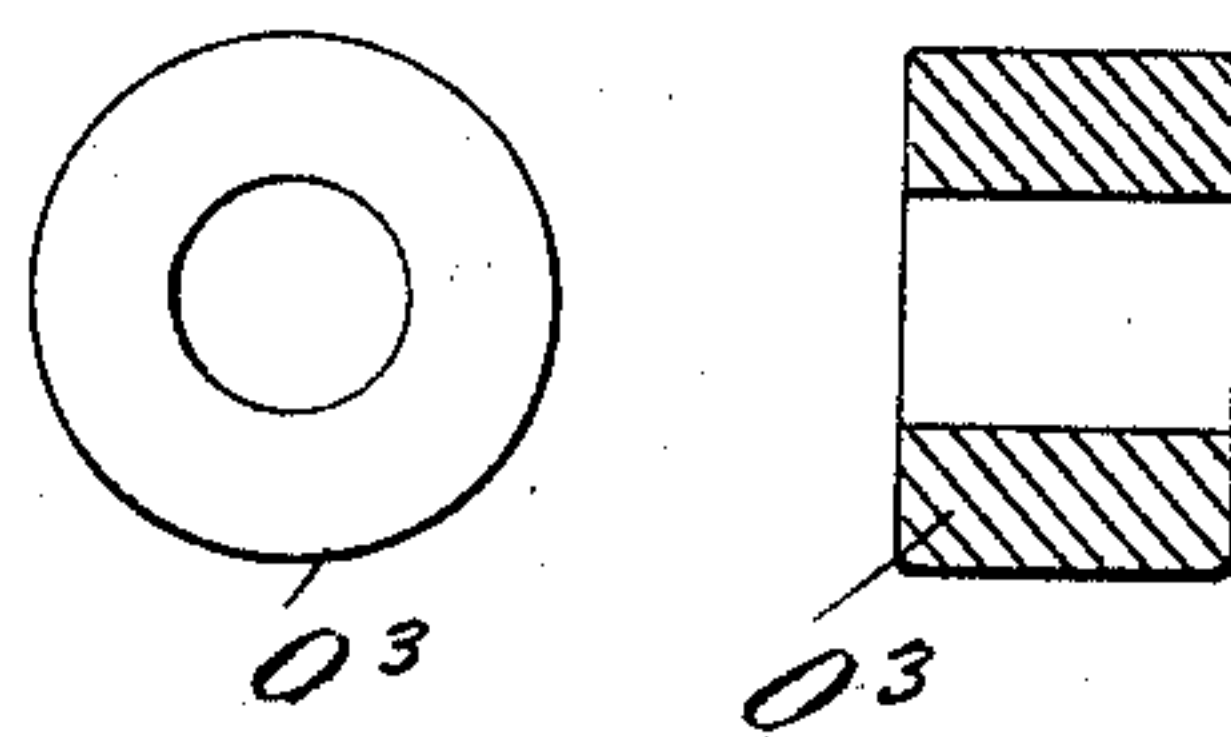


Fig. 6

Fig. 7



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UNITED STATES PATENT OFFICE.

SAMUEL A. HINTON, OF ALTOONA, PENNSYLVANIA.

STEAM-VALVE FOR LOCOMOTIVES OR OTHER ENGINES.

SPECIFICATION forming part of Letters Patent No. 605,282, dated June 7, 1898.

Application filed May 20, 1897. Serial No. 637,391. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL A. HINTON, a citizen of the United States, residing at Altoona, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Means for Operating the Steam-Valves of Locomotives or other Engines, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to means for operating the steam-valves of locomotives, marine, stationary, and other engines; and the object thereof is to provide improved devices for this purpose which are operated by a single eccentric, so as to reverse the motion of the engine whenever desired, said eccentric being adapted to move said steam-valve either forward or backward.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is an isometric view of the mechanism which I employ; Fig. 2, a front view of a part thereof; Fig. 3, a side view of a roller-box which forms a part of my improvement; Fig. 4, an edge view thereof; Fig. 5, an end view of a detail of the construction; Fig. 6, a side view thereof, showing a roller mounted thereon in dotted lines; and Fig. 7, an end and sectional side view of the roller shown in dotted lines in Fig. 6.

In the drawings forming part of this specification the separate parts of my improvement are designated by the same letters of reference in each of the views, and in said drawings I have shown at A the main driving shaft or axle of a locomotive, which is provided at its ends with the usual crank a , but one of which is shown, and I have also shown at a^2 a rocker-shaft which is supported in a tubular sleeve or bearing a^3 and which is provided at its opposite ends with cranks a^4 and a^5 , and connected with one of these cranks is the valve-rod a^6 , which in practice is connected with a steam-valve, which is not shown. I have also shown at B a supplemental or lifting shaft which is supported in bearings b , and it will be apparent that the bearings b of the shaft B and the bearing a^3 of the rocker-shaft a^2 are connected with the frame-

work of the locomotive or engine in any desired manner, and said shaft B is provided with two similar cranks b^2 , and the shaft B, provided with the cranks b^2 , is of the form applied to locomotives, and connected with the crank a^5 of the rocker-shaft a^2 is an eccentric-rod a^7 , and connected with the cranks b^2 are crank-rods b^3 . I also provide two yoke-shaped brackets or supports D, but one of which is shown, and these brackets can rest on the main driving shaft or axle A or are bolted to the driving-box A' of the locomotive to insure a proper relative position of the said bracket, and for this purpose holes or openings d are formed in said bracket and are made oblong in form in order to provide for a slight movement of said brackets or supports.

Mounted on the inner side of each of the brackets or supports is a roller box or frame G, the form and construction of which are best shown in Figs. 3 and 4, and said roller box or frame consists of an upright plate g , provided with an upwardly-directed extension g^2 and at its opposite sides with flanges g^3 , which project inwardly from the bracket or support D, and connected with the inner sides of each of the flanges g^3 is a steel wedge g^4 , each of which is provided at its upper end with an outwardly-directed arm g^5 , through which passes a screw-threaded bolt g^6 , and the screw-threaded bolt g^6 passes into the upper ends of the flanges g^5 , and said bolts are provided with set-nuts g^7 and g^8 , one of which is mounted above and the other below the arms g^5 of the wedges g^4 , and the flanges g^3 are provided with vertical slots H, through which are passed screws or bolts h , which are screwed into the wedges g^4 , and said wedges g^4 are vertically adjustable by means of this construction.

The lower end of the roller box or frame G is circular in form, as shown at h^2 , and provided with a flange or rim, which projects in the same direction as the flanges g^3 , and bolted thereto is a plate h^3 , whereby an oil-well h^4 is formed, and the plate h^3 is provided in its upper side with a semicircular notch or recess h^5 .

The roller box or frame G is provided with an outwardly-directed shaft K, which passes through the upper portion of the bracket or support D, on which is mounted a nut k , and the said roller box or frame is free to swing

on the bracket or support D, and it will be understood that in practice two of these devices are employed, but one of which is shown, and the crank-rods b^3 , which are connected with the cranks b^2 of the shaft B, are connected with the upwardly-directed extensions g^2 of the roller box or frame, as shown at k^2 .

Mounted on the shaft A adjacent to the inner sides of the roller box or frame G is an eccentric M, but one of which is shown, and said eccentric is provided with the usual strap or band m , which is composed of two parts connected at m^2 , and the upper part of said eccentric band or strap is provided with an upwardly-directed extension m^3 , with which the eccentric-rod a^7 is connected, as shown at m^4 , and this connection is made by means of a vertical slot m^5 , formed in the upwardly-directed extension m^3 of the eccentric band or strap, and a pin or bolt m^6 , which passes through a sleeve m^7 , mounted in the slot m^5 , said sleeve being composed of two parts, each of which is provided at its outer end with a flange or rim, as clearly shown in Fig. 2, and by means of this construction the extent of the movement of the steam-valve may be regulated, the raising of the end of the eccentric-rod increasing the distance through which the steam-valve moves and the lowering of the same decreasing said distance, whereby the passage of the steam into the cylinder is regulated.

The upper portion of the eccentric strap or band m is provided with oil-holes m^8 in the usual manner, on which are placed oil-cups m^9 , and passing through the vertical center of the upwardly-directed extension m^3 of the eccentric strap or band m is a shaft O, which is conical in form where it passes through the said upwardly-directed extension m^3 of the eccentric band or strap, and said shaft is provided with a collar O^2 , and mounted on the outer end thereof is a roller O^3 , which is made of steel hardened and ground inside and outside and which travels in the roller box or frame or between the vertically-movable wedges g^4 , mounted therein, and one end of the shaft B is provided with a crank-arm P, to which connection is made by a reach-rod from the cab of the locomotive or engine.

The collar O^2 of the shaft O, on which the roller O^3 is mounted, is provided with a vertical passage at O^4 , which communicates with a longitudinal passage in the end of said shaft on which the roller O^3 is mounted, said longitudinal passage being provided with side ports or passages which open outwardly through the sides of said shaft, this construction being best shown in dotted lines at O^5 in Fig. 6; and the object thereof is to provide means for oiling the roller O, and the semicircular notch or recess h^5 in the upper side of the plate h^3 , which is bolted to the lower end of the roller box or casing, is adapted to receive the shaft O when the eccentric M is in its lowest position.

It will be understood that this mechanism is adapted for use primarily in connection with reversible engines, and it will be understood that the bracket or support D, the roller-frame G, the eccentric M, and the eccentric strap or band mounted thereon, the valve-rod a^6 , the rocker-shaft a^2 , the cranks a^4 and a^5 , connected therewith, and the eccentric-rod a^7 are all duplicated; but in the drawings the only parts of this construction which are shown duplicated are the cranks b^2 on the shaft B and the crank-rods b^3 .

The operation will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

By simply manipulating the crank P, which is under the control of the party in charge of the locomotive or engine, the valves with which the valve-rods a^6 are connected may be operated so as to reverse the motion of the engine or locomotive whenever desired, this operation being accomplished by means of the swinging rocker box or frame G, with which the crank-rods b^3 are connected, and the eccentrics M, with which the eccentric-rods a^7 are connected, together with the rollers O^3 , which operate in connection with the roller boxes or frames, and the wear of the rollers O^3 may be taken up at any time by means of the wedges g^4 , so as to cause the parts to operate smoothly and regularly at all times. By means of this construction the finest adjustments may be made, and the roller boxes or frames may be incased, if desired, so as to exclude dust and dirt therefrom, and the eccentrics may be kept well oiled at all times, and the direction of the motion of the steam-valves is regulated by the roller boxes or frames by which the eccentrics and the parts connected therewith are operated, and the roller boxes or frames may be so adjusted as to increase or decrease the space through which the valves move and thus regulate the point of cut off so as to control the admission of steam to the cylinders, whereby only the desired amount of steam is admitted, the result being that the steam is utilized to the highest degree and in the best possible manner, thus largely increasing the power of the engine and economizing in the amount of the steam used. The mechanism is also simple in construction and is not liable to get out of order or to be broken and thus frequently necessitate repairs, and many other changes will readily suggest themselves to all those familiar with this class of devices.

It will thus be seen that I accomplish the object of my invention by means of a mechanism which is simple in construction and operation and well adapted to produce the result for which it is intended, and it will be apparent that changes in and modifications of the construction herein described may be made without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with the driving shaft 5 or axle of a locomotive or engine, of brackets or supports mounted thereover, a roller box or frame pivotally connected thereto, an eccentric mounted on said shaft or axle adjacent to said roller box or frame, a strap or 10 band encompassing the same, an upwardly-directed extension, an antifriction-roller supported thereby and operating in said roller box or frame, connections between said upwardly-directed extension and the steam- 15 chest, means for operating said roller box or frame and means for taking up the wear on the bearing-surfaces of said roller box or frame, substantially as described.

2. The combination with the driving shaft 20 or axle of a locomotive or engine, of brackets or supports mounted thereover, a roller box or frame pivotally connected thereto, an eccentric mounted on said shaft or axle adjacent to said roller box or frame, a strap or 25 band encompassing the same, an upwardly-directed extension, an antifriction-roller supported thereby and operating in said roller box or frame, connections between said upwardly-directed extension and the steam- 30 chest, means for operating said roller box or frame, adjustable wedges for taking up the wear on the bearing-surfaces of said roller box or frame, and means for securing said wedges in position, substantially as described.

3. The herein-described valve-operating 35 mechanism for locomotives or engines, comprising the main drive shaft or axle of the locomotive or engine, brackets or supports mounted thereover, roller boxes or frames 40 pivotally connected with said brackets or supports, eccentrics mounted on said shaft or

axle adjacent to said roller boxes or frames, and provided with straps or bands having outwardly-directed extensions, rollers connected with said upwardly-directed extensions, and 45 operating in said roller boxes or frames, operative devices connecting said extensions of the eccentric straps or bands with the valves, and means for operating said roller boxes or frames, consisting of a shaft, suitably supported, and provided with crank-rods 50 which are connected with said roller-boxes said shaft being also provided with means for operating the same, substantially as shown and described. 55

4. In a valve-gear for locomotive or other engines a roller box or frame comprising a plate, guide-flanges supported thereon, a well for oil or other lubricant attached to the lower 60 portion thereof, a roller operating in said frame and connections between said roller and the power-shaft, and between said roller and the steam-chest, substantially as described.

5. In a valve-gear for locomotive or other 65 engines a roller box or frame comprising a plate, guide-flanges supported thereon, wedge-shaped bars bearing against said flanges and removably attached thereto, a well for oil or other lubricant attached to the lower portion 70 thereof, a roller operating in said frame, and connections between said roller and the power-shaft, and between said roller and the steam-chest, substantially as described.

In testimony that I claim the foregoing as 75 my invention I have signed my name, in presence of the subscribing witnesses, this 12th day of May, 1897.

SAMUEL A. HINTON.

Witnesses:

CATHERINE V. HINTON,
HARRY W. JAMES.