(No Model.)

H. L. HOPKINS.

AUTOMATIC ADJUSTER FOR BEARING BOXES.

No. 441,797. Patented Dec. 2, 1890.

Fig 1

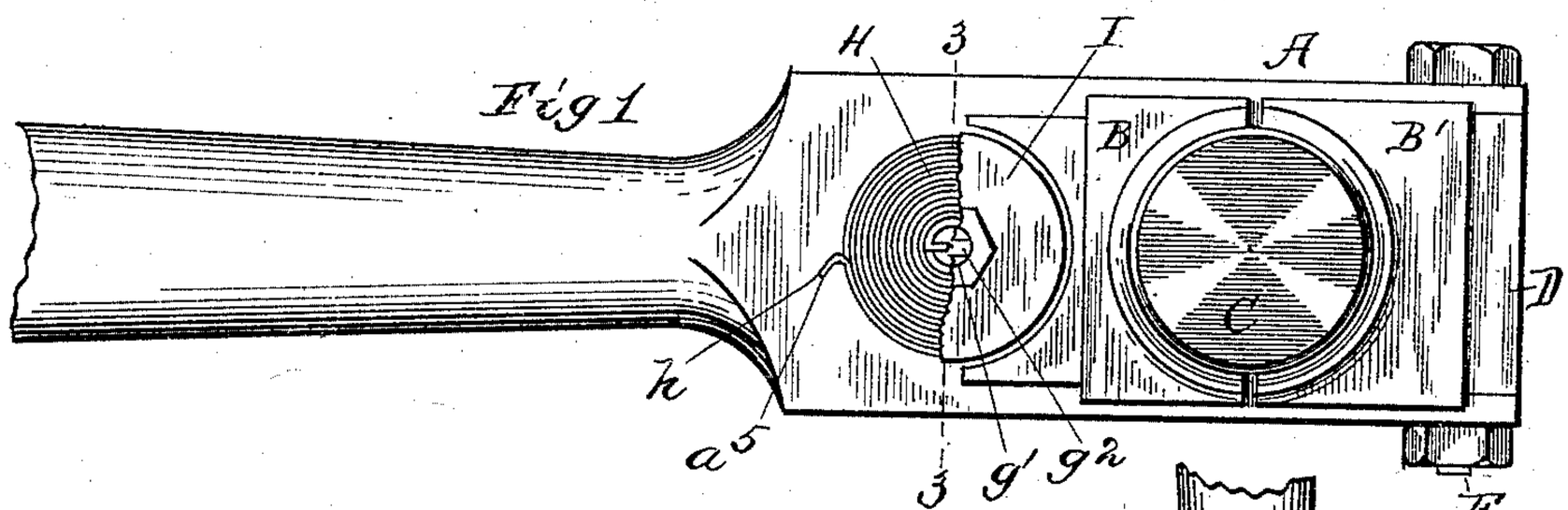

Fig 3

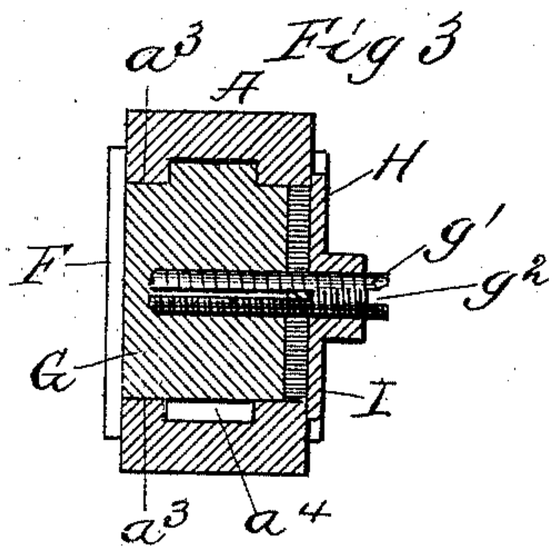

Fig 2

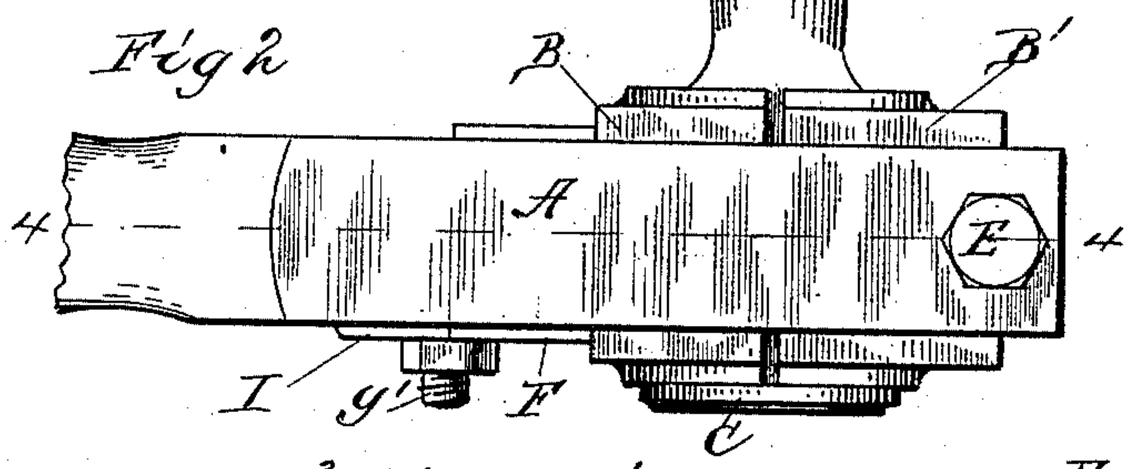

Fig 4

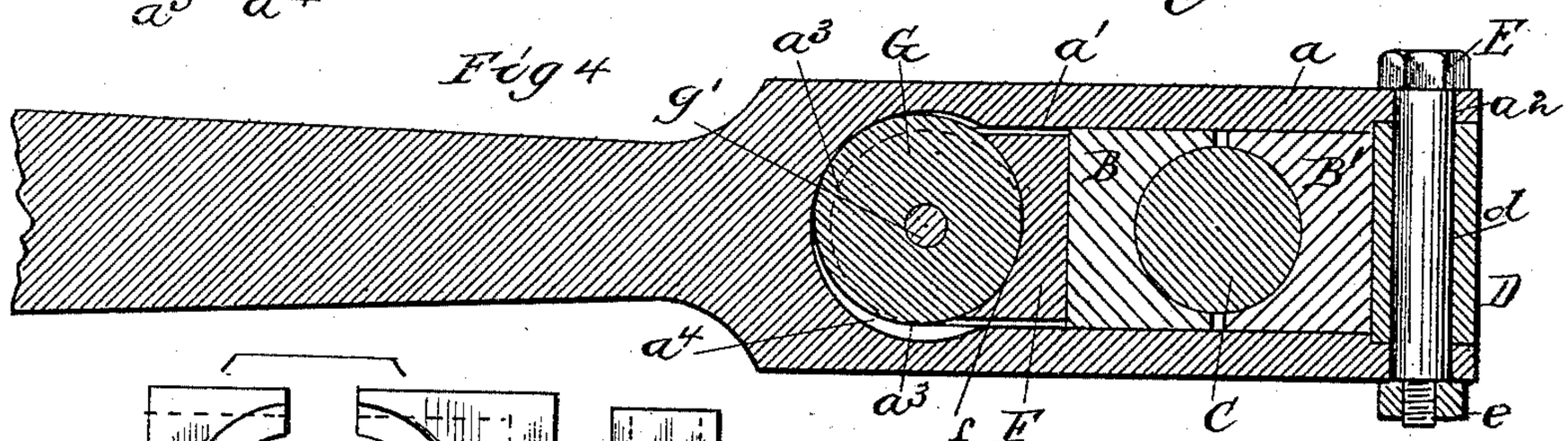

Fig 5

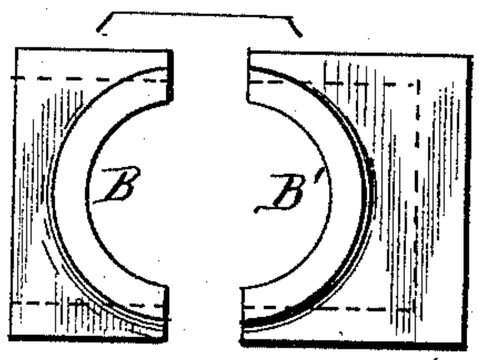

Fig 6

Fig 7

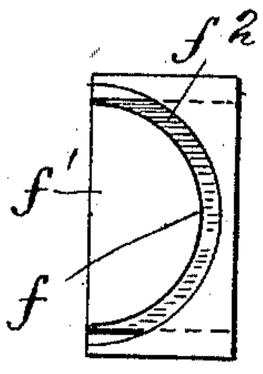

Fig 8

Fig 9

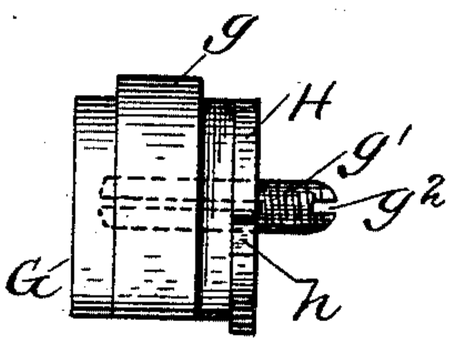

Fig 10

Witnesses

W. C. Cockley

A. M. Best

Inventor

Harvey L. Hopkins

By Coburn & Thacher

Attys

UNITED STATES PATENT OFFICE.

HARVEY L. HOPKINS, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHARLES HIMROD, OF SAME PLACE.

AUTOMATIC ADJUSTER FOR BEARING-BOXES

SPECIFICATION forming part of Letters Patent No. 441,797, dated December 2, 1890.

Application filed July 2, 1890. Serial No. 357,554. (No model.)

To all whom it may concern:

Be it known that I, HARVEY L. HOPKINS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Adjusters for Bearing-Boxes, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of the head of a pitman or connecting-rod embodying my invention, a portion of the spring-cap being broken away; Fig. 2, a plan view of the same; Fig. 3, a cross-section of the same, taken on the line 3 3 of Fig. 1; Fig. 4, a longitudinal section taken on the line 4 4 of Fig. 2; Fig. 5, a side elevation of the boxes detached; Fig. 6, a similar view of the head-block detached; Fig. 7, a similar view of the cam-block detached; Fig. 8, a side elevation of the cam detached; Fig. 9, an edge elevation of the same and its actuating-spring; Fig. 10, an elevation of the cam-screw.

My invention relates to a device for automatically adjusting the boxes of connecting-rods, pitmen, and all other similar box-bearings, whereby all wear is automatically taken up as it occurs and the boxes are always held in proper bearing contact with the journal which they inclose.

Heretofore Letters Patent have been granted to me, No. 421,715, dated February 18, 1890, for the general invention which is here involved; and the present invention may be regarded as in some sense an improvement upon the said patented invention, whereby it is adapted for application to the particular class of devices mentioned above.

I will proceed to describe in detail one way in which I have carried out my invention in practical form, and will then point out more definitely in claims the special improvements which I believe to be new and wish to secure by Letters Patent.

The particular device shown in the drawings with this invention applied thereto is the connecting-rod of a locomotive; but this particular device is adopted simply for the purpose of illustration. The invention is applicable to very many other devices and in many other locations where box-bearings are employed, and I wish to be understood as claiming the invention in all its possible applications.

In the accompanying drawings, A represents one end of a connecting-rod, the head *a* of which is forked or slotted, as usual, the respective arms of the fork or slot being marked *a'*. Within this head are fitted the usual bearing part boxes B and B', the former being the inner and the latter the outer part box, and C indicates the wrist or crank, which is inclosed by these part boxes, as usual. When forked, a head-block D is fitted within the outer ends of the forks, as seen in Fig. 4 of the drawings, to keep them perfectly parallel, having a perforation *d* extending through its entire length, and a fastening-bolt E is inserted through apertures a^2 in the extremities of the fork-arms, and this perforated block is secured by a nut *e* at its other end, whereby the fork-arms are fastened together and the boxes held in place. The recess or opening of the fork in the head of the device is somewhat longer or deeper than usual, and immediately behind the inner part box B is arranged a bearing-block F, which is fitted within the fork-arms by guiding-flanges on each side thereof the same as the box; but the body of this block is a little less in width than that of the box, as seen in Fig. 4, so that the block has a little vertical movement within the fork-arms, this construction being a necessity when the parts are arranged as here shown. The outer face of this block is perfectly plane and adapted to fit the inner or back face of the part box B; but its inner face is concave, the concavity *f* being very deep, as seen in Fig. 7 of the drawings. The flange *f'* on one side of this block extends out past the recess, as is also seen in Fig. 7, while at the other side it is cut away so as to be of less width than the thickness of the block even, thereby providing a narrow ledge or seat f^2 at this side of this box, which preferably will be the side arranged on the outer

or front side of the connecting-rod. The bottom of the fork is concaved, so as to provide a circular seat a^3 at the bottom or inner end of the fork. This seat is, however, cut out centrally, so as to form quite a wide groove a^4, which extends in somewhat deeper than the outer portions of the seat, making a kind of concave recess between the latter. This construction at the bottom of the fork is for the purpose of properly seating a short cam-cylinder G, the outer diameter of which corresponds to the spread of the forks, so that the cylinder may be fitted within the arms of the fork and seated at the bottom thereof on the circular seat just described. This cylinder is solid, and on one side thereof is thrown up a regular cam or eccentric g, extending around the middle portion of the cylinder and somewhat more than one-half its circumference, as seen in Figs. 8 and 9 of the drawings. This cam-cylinder is arranged in the fork between the bottom of the latter and the bearing-block F, as seen in Fig. 4, the cam projection g being received in the groove a^4 of the seat, while the outer ends of the cylinder proper, on either side of this projection, will find a bearing upon the outer sections of the seat a^6 on each side of said groove. The eccentric or cam cylinder G is cut off slightly at one end, so that it does not come out flush with the side of the head, this being preferably at the front side of the latter, and a coiled spring H is applied to this end of the cylinder, the latter being provided with a stud or pin g', rigidly fastened to the cylinder, and the spring being attached at its inner end to this stud and at its outer end to the head of the connecting-rod by giving the spring a slight bend or hook h at this end, which is inserted in a little niche a^5 in the head, as seen in Fig. 1. The width of this spring is preferably such as to fill the space provided by cutting away the end of the cylinder, so that the outer edge of the spring will be flush with the face of the head. The outer end of the stud g' is threaded, and upon it is turned a cap or cover I, which completely fits over and covers the spring within, thereby holding it in position and keeping out dirt. The outer end of the stud or pin g' has a cross-notch g^2 for convenience in turning the latter by a small screw-driver or any other suitable piece, this being desirable for the purpose of turning back the eccentric when the parts are to be released. These several parts described above are arranged in position, as seen in Figs. 1 and 4 of the drawings, under which arrangement the cam portion of the cylinder is mainly back in the groove or recess at the bottom of the fork and the spring sufficiently coiled to give it the required tension. Obviously under this arrangement the spring acts constantly to turn the eccentric cylinder around, thereby bringing the cam projection to bear directly upon the bearing-block F, which in turn presses the part box B up into contact with the wrist, thereby bringing the part-box into proper bearing position; but the spring being constant in action it is obvious that at the least release of the resistance to its action the eccentric will be turned so as to keep it constantly up in bearing contact against the block F, and so the proper bearing contact of the part boxes will be constantly maintained, the usual wear being taken up immediately and as fast as it occurs, so that there is no possibility whatever of any looseness in the boxes and no danger whatever of the least "pounding." The slight vertical play of the block F in the fork provides for the proper seating of the cam therein and the forward movement of the block under the action of the latter. At the same time it will be seen by following the bearing-line from one end to the other of the head that the bearing is a perfectly solid one, one unyielding face coming against another similar face until the bottom of the fork is reached and no one part can yield in either direction without the application of force. This feature is a very important one, which will be appreciated by mechanics.

Modifications may be made in the application of my invention to different devices and in different situation. Hence I do not wish to be understood as limiting my invention to the particular construction and arrangement of the devices herein shown and described, provided always a wedging surface is brought to bear upon one of the boxes under the constant force of a spring, and the parts are constructed and arranged so that a solid bearing is obtained throughout.

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

1. A connecting-rod provided with a fork or slotted head, in combination with part-box bearing arranged within said fork or slot, a wrist mounted in said bearing, a circular cam or eccentric seated within the fork or slot of the head in the rear of the box and free to turn in its seat, and a spring applied to said cam and arranged to constantly turn the latter outward toward the box, substantially as and for the purposes specified.

2. The forked head a, in combination with the bearing-box B B′, the wrist C, the bearing-block F, the circular cam or eccentric G, and the coiled spring H, substantially as and for the purposes specified.

3. The forked head a, provided at the bottom of the fork with a concave seat a^3, having a central groove a^4, in combination with the box B B′, the eccentric G, mounted in said seat with its cam projection g in said groove, and a coiled actuating-spring H, applied to the eccentric, substantially as and for the purposes specified.

4. The forked head a, in combination with

the bearing-box B B′, the bearing-block F, a little less in width than the space between the fork-arms, the eccentric G, and the coiled spring H, substantially as and for the purposes specified.

5. The forked head *a*, in combination with the bearing-box B B′, the bearing-block F, constructed as described, the eccentric G, the coiled spring H, arranged at one end of the eccentric, and the cap I, substantially as and for the purposes specified.

HARVEY L. HOPKINS.

Witnesses:
CARRIE FEIGEL,
A. M. BEST.