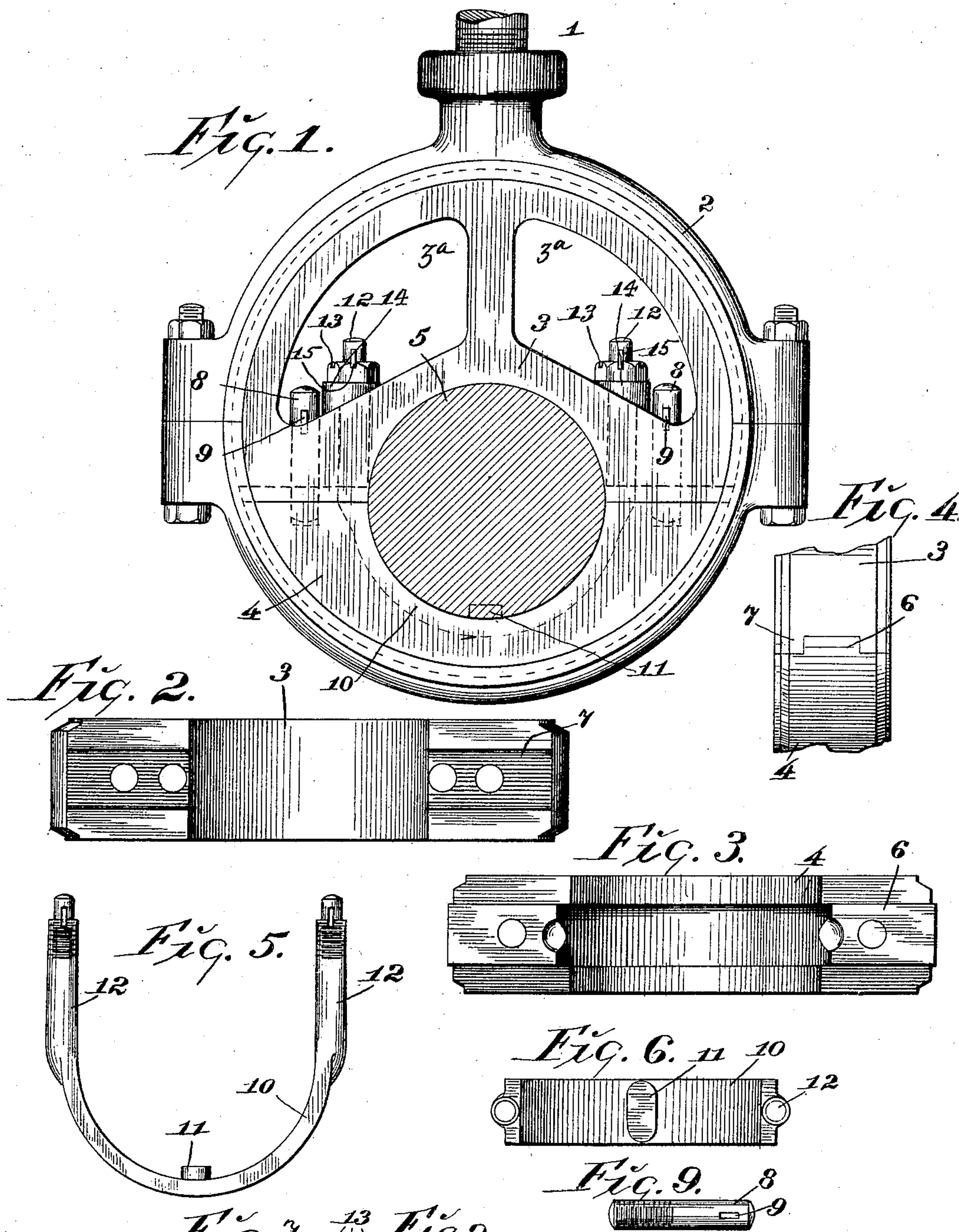


J. W. H. HANDLEY.

ECCENTRIC.

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Witnesses

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## UNITED STATES PATENT OFFICE.

JOHN WILLIAM HOMER HANDLEY, OF MACON, GEORGIA.

## ECCENTRIC.

SPECIFICATION forming part of Letters Patent No. 790,892, dated May 30, 1905.

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*To all whom it may concern:*

Be it known that I, JOHN WILLIAM HOMER HANDLEY, a citizen of the United States, residing at Macon, in the county of Bibb and State of Georgia, have invented certain new and useful Improvements in Eccentrics; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to eccentrics which are separable and adjustable, characterized usually by an eccentric block or disk composed of separable sections secured together around the engine-shaft and adjustably clamped thereon by means of a U-bolt embracing the shaft and having its arms inserted through holes in one eccentric-section and fastened by nuts or suitable tightening devices. Eccentrics of this type possess the advantages over ordinary eccentrics of capability of application to a shaft without slipping the eccentric on the shaft from one end, capacity for adjustment without necessitating the removal of the eccentric, as well as others on the same shaft, and planing another key, and facility in repairing and avoidance of long delay in case of breakage of an eccentric of a locomotive on the road, since either of the separable parts can be readily removed if broken and replaced by a duplicate part kept on hand by the engineer. However, as heretofore constructed such separable and adjustable eccentrics have been liable to the tendency to slip around on the shaft in case of the working loose of the U-bolt fastenings and also subject to the disadvantage of slipping around entirely out of place when the nuts have been unfastened or loosened for adjustment, necessitating great care to hold the eccentric in place and prevent such movement. Adjustments have been determined entirely by the judgment of the engineer by loosening the fastening-nuts of the U-bolt and turning the eccentric to the desired position and then tightening the nuts. In cases where the U-bolt has broken, the clamp to the shaft having thus been severed, there has been nothing to prevent the eccentric from turning on the shaft. Furthermore, it has been impractic-

able to mount such eccentrics close beside each other or beside a wheel or bearing, owing to the presence of lateral fastenings and projections, and the difficulty of manipulating such fastenings and driving out the transverse bolts which unite the eccentric-sections from the narrow space between two eccentrics or between an eccentric and wheel or bearing. In the case of a locomotive, where usually two eccentrics are arranged side by side at each end of the driving-wheel shaft, the "back-up" between the wheel and the "go-ahead," it has been necessary either to leave sufficient spaces between the two eccentrics and between the wheel and back-up to permit driving out the transverse bolts or else to take off the go-ahead before separating and detaching the back-up.

My invention consists of an improved eccentric of the separable and adjustable type above described of simple construction, efficient and reliable operation, and by virtue of which all the advantages of such eccentrics over ordinary eccentrics are attained, while the above-mentioned difficulties and objections are avoided, my improved device having the following advantages and distinguishing characteristics, viz: First, the eccentric can be accurately adjusted to change the lead of the valve without removing the eccentric and without the slightest danger of the eccentric slipping around on the shaft when the U-bolt nuts are loosened for such adjustment; second, all the fastening-bolts are transverse to the engine-shaft and contained within the body of the eccentric itself, so that the eccentric can be set close beside another or between a wheel and another eccentric, and either or both of its sections can be removed without disturbing the other eccentric, and, third, the eccentric is of strong construction and cannot possibly slip, even should the U-bolt break, since the lug on the U-bolt keeps it from slipping sidewise, as well as around the shaft.

The invention will first be described with reference to the accompanying drawings, which are to be taken as a part of this specification, and then pointed out more particularly in the claims following this description.

In said drawings, in which corresponding



parts in the several figures are indicated by like symbols of reference, Figure 1 is a side view of an eccentric embodying my invention. Fig. 2 is a detail plan view of the larger member of the eccentric looking at the face which abuts the face of the smaller member. Fig. 3 is a similar view of said smaller member looking at the corresponding or adjacent face thereof. Fig. 4 is a fragmentary front view of the joint between the two members. Fig. 5 is a detail side view of the yoke or U-shaped piece. Fig. 6 is a plan view of the yoke. Fig. 7 embraces side and top detail views of one of the locking-nuts. Fig. 8 embraces side and top detail views of one of the keys. Fig. 9 is a detail view of one of the eyebolts which hold the two parts of the eccentric together.

The eccentric is shown in Fig. 1 surrounded by an eccentric-strap 2, connected to a connecting-rod 1. The eccentric is of the usual circular or disk form to revolve freely within its eccentric-strap. It comprises two separate unequal sections or members 3 and 4, having in their adjacent faces confronting semicircular recesses which provide the usual eccentrically-disposed opening to receive the shaft 5. The main section 3 is recessed or cut away at opposite sides of the axis of the connecting-rod, leaving the usual transverse openings 3<sup>a</sup> therein, which afford places within the body of the eccentric itself for the nuts and fastenings of the devices which secure the parts in place. The two sections 3 and 4 are held in fixed relation laterally by an interengaging tongue and groove 6 and 7, and they are secured together by screws or eyebolts 8 at opposite sides of and transverse to the shaft 5. These eyebolts are inserted from said openings 3<sup>a</sup> through holes therefor in member 3, screwed into threaded bolt-holes therefor in member 4, having their outer or free ends projecting in the recesses or openings 3<sup>a</sup> of the member 3 and having wedge-shaped keys 9 inserted through slots in their outer ends to bind them rigidly with the larger member of the eccentric, said keys bearing against the inner faces of the section 3 within its openings 3<sup>a</sup>. In the inner periphery of the smaller member 4 is a groove or recess in which is placed a yoke or U-bolt 10, having a medial lug 11, which engages a slot or recess therefor in the engine-shaft and the two branches of which embrace the engine-shaft and have their ends in the form of bolts 12, projecting through holes therefor in the larger member 3 and having nuts 13 screwed thereon against beds 14 therefor formed on the member 3 within the openings 3<sup>a</sup>. Said nuts 13 are shown locked in place by wedge-shaped keys 15, inserted through slots in the ends of bolts 12 and engaging slots across the faces of the nuts. A number of such slots are formed in the nuts to permit locking them at different positions.

This eccentric is strong and efficient and

possesses decided advantages in the matter of adjustment and mounting it on or taking it off the shaft, obviating the faults of ordinary eccentrics, as before pointed out. When the strap 2 is off, the eccentric can be taken apart simply by withdrawing the keys 9 from the eyebolts 8 and then drawing the member 4 from member 3, then by withdrawing the keys from the U-bolts, and taking the nuts off such bolts. When it is desired to adjust the eccentric to alter its angular advance, this can be accomplished simply by withdrawing the keys 15 and unscrewing one nut 13 and screwing up the other nut, causing the eccentric as a whole to turn on the shaft, the sides of the groove and the holes for the U-bolt having sufficient clearance to allow the necessary play for adjustment. After the desired adjustment is made the keys 15 should be replaced. By virtue of the lug 11 the U-bolt is held in fixed position on the shaft at all times, and thus not only holds the eccentric rigid with the shaft when the nuts 13 are tight, but also prevents the eccentric from slipping around when the nuts are loosened for adjustment. The danger of this mishap being avoided, the nuts can be loosened and the eccentric accurately adjusted without the necessity of employing extraneous means for preventing it from slipping around, the extent of adjustment being determined solely by the manipulation of the nuts 13. For example, one nut can be loosened and the other tightened by turning them both the distance from one cross-slot to another. Such adjustment of the nut shown in Fig. 7 would obviously amount to a one-sixth turn. If a greater adjustment be desired, the nuts can be turned to the next slots or still farther. Thus any desired adjustments may be obtained, according to the number of cross-slots in the faces of the nuts and within the allowed limit of movement of the eccentric with respect to the U-bolt. The whole extent of adjustment need not be great, since large adjustments are not necessary.

It will be observed that the arrangement is such that the fastenings are transverse to the shaft 5, and the fastening devices project within the openings 3<sup>a</sup> in the body of the eccentric-block, thus obviating all lateral projections, which if present would interfere with mounting the eccentric close to another eccentric or wheel or other body and also render it difficult, if not impossible, to mount or detach one eccentric close beside another or between another and a wheel. For example, in a locomotive two eccentrics—a go-ahead and back-up—are mounted on each end of the driving-wheel shaft, the back-up being usually located between the go-ahead and the driving-wheel. By virtue of my improved construction the two eccentrics can be mounted close beside each other and near the driving-wheel without interference from lateral projections, and either eccentric can be ad-



justed or taken off or put on the shaft entirely independently of the other, since the fastenings are all operated within the openings 3<sup>a</sup> of the eccentric-block.

5 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An adjustable eccentric comprising a disk having an eccentric-bore, and a U-bolt associated therewith, adapted to embrace the shaft, having a lug adapted to engage a recess therefor in the shaft, having its arms extending through holes in the disk transverse to said bore, and fastening-nuts screwed on its ends 15 for clamping the eccentric to the shaft.

2. An eccentric comprising a disk having an eccentric-bore and composed of two separable sections, means securing said sections rigidly together, a U-bolt adapted to embrace the shaft 20 and having its arms extending transversely to said bore through holes therefor in one section, said U-bolt having means for connection with the shaft to prevent the former from slipping on the latter, and fastening devices 25 engaging the ends of said U-bolt for clamping said section thereby to the shaft.

3. An adjustable eccentric comprising a disk having an eccentric-bore and composed of two separable sections, means securing said sections rigidly together, a U-bolt placed in a groove or recess therefor in one section, adapted to embrace the shaft, said U-bolt having a lug adapted to engage a recess in the shaft, and having its arms extending through 35 holes transverse to the shaft in the other section, and fastening-nuts screwed on the ends of said U-bolt for clamping the eccentric to the shaft.

4. An eccentric comprising a disk having an eccentric-bore and composed of two separable sections, fastening-bolts at opposite sides of said bore uniting said sections and inserted in bolt-holes therein transverse to said bore and between the opposite faces of the eccentric, a 45 U-bolt adapted to embrace the shaft lying in a grooved recess therefor in one section and

having its arms extending through holes in the other section, said U-bolt also being contained within the eccentric between its opposite faces, and fastening-nuts on the ends of 50 said U-bolt for clamping the eccentric to the shaft.

5. An eccentric comprising a disk having an eccentric-bore and composed of two separable sections, the larger section having transverse 55 openings therein, fastening-bolts at opposite sides of said bore rigidly uniting said sections and inserted through bolt-holes in the body of the eccentric transverse to said bore, the heads of said bolts being located in the afore- 60 said openings in the larger section, a U-bolt placed in a groove or recess in the smaller section, adapted to embrace the shaft, and having its arms extending through holes in the larger section and protruding into said open- 65 ings, said U-bolt having means for connection with the shaft to prevent the former from slipping on the latter, and adjustable fastening-nuts screwed on the ends of said U-bolt.

6. An eccentric comprising a disk having an eccentric-bore and composed of two separable sections, the larger section having two open- 70 ings therethrough at opposite sides of said bore and four bolt-holes two of which extend from each opening to the edge of the section adjacent to the other section, a U-bolt placed 75 in a groove in the smaller section and adapted to embrace the shaft and having its arms extending through two of said bolt-holes at opposite sides of said bore, adjustable nuts 80 screwed on the ends of said arms, eyebolts inserted in the other two bolt-holes and screwed into threaded sockets in the smaller section, and fastening-keys driven through the eyes or openings in the heads of said eyebolts to hold 85 the sections rigidly together.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WILLIAM HOMER HANDLEY.

Witnesses:

M. FELTON HATCHER,  
AUGUSTIN DALY.