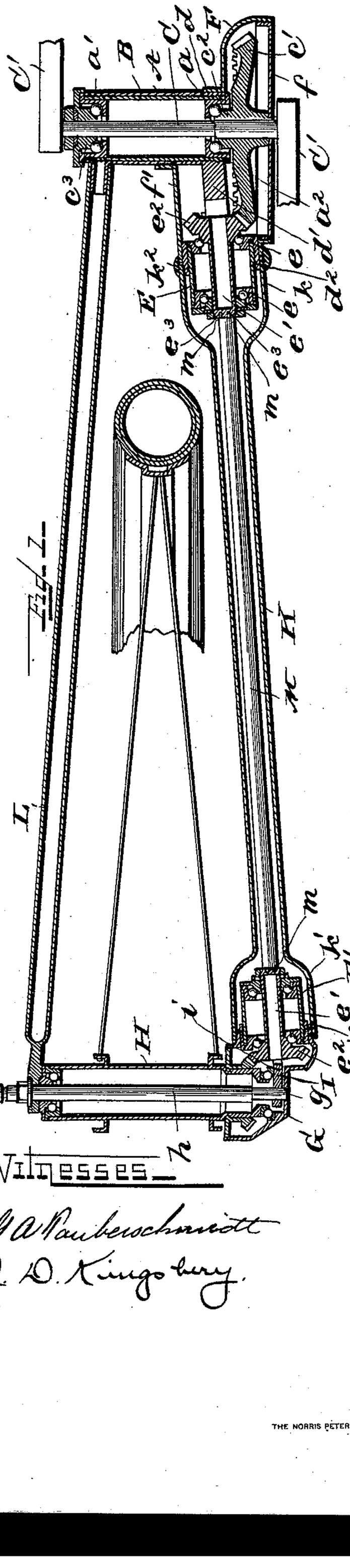
No. 613,886. Patented Nov. 8, 1898.

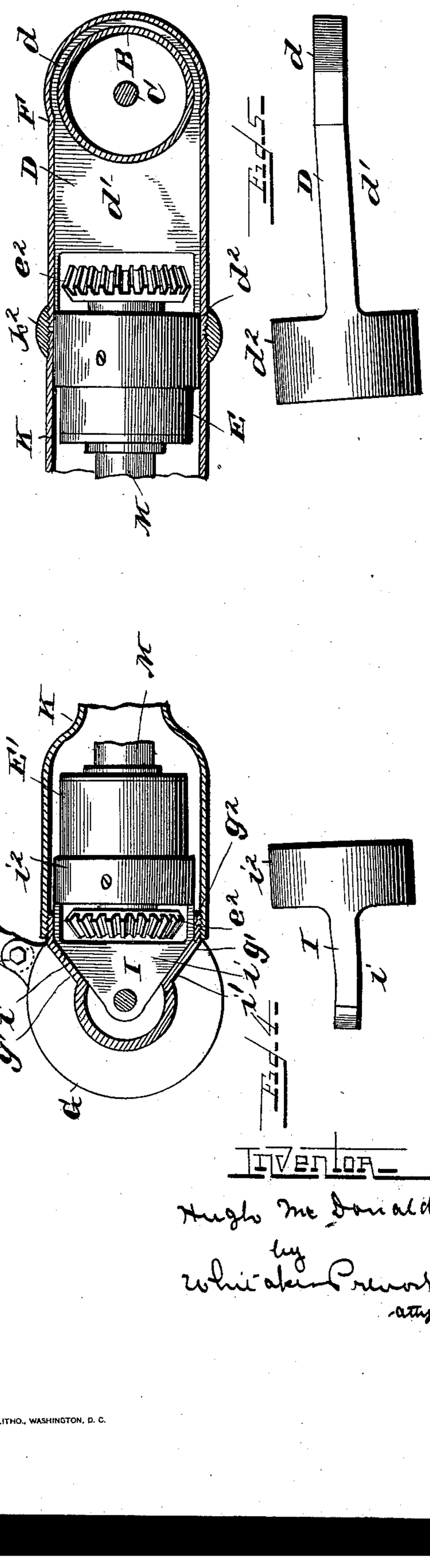
H. McDONALD.

BICYCLE.

(Application filed Nov. 4, 1897.)

(No Model.)





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UNITED STATES PATENT OFFICE.

HUGH McDONALD, OF WILLIAMSPORT, PENNSYLVANIA.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 613,886, dated November 8, 1898.

Application filed November 4, 1897. Serial No. 657,417. (No model.)

To all whom it may concern:

Be it known that I, HUGH McDONALD, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Bicycles; 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.

My invention is an improvement in bicycles; and it consists in the novel features hereinafter described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

Referring to the drawings, Figure 1 is a horizontal sectional view of the crank-hanger, rear side bars, and rear hub, showing the driving-gear and its adjacent parts. Fig. 2 is an enlarged vertical sectional view of the casing for the bevel-gear on the rear hub and the rear portion of the shaft carrying side bar. Fig. 3 is a similar view, the section being taken through the crank-hanger and the forward end of the side bar. Figs. 4 and 5 are detail views of the yokes which carry the bearing-sleeves for the side-shaft pinions.

In the drawings, A represents the crank-hanger, which is cut off on one side, as shown at a, Fig. 1, and is interiorly threaded at its other end at a'.

B represents the bearing-sleeve for the crank-shaft, which is threaded on its exterior and is screwed into the hanger A. This sleeve is provided at each end with a ball-cup and bearing-balls. The crank C is provided adjacent to one end with a beveled driving-gear c' and cone c^2, preferably formed integral with said gear for engaging one of the bearings in the bearing-sleeve. The other end of the shaft is threaded to receive the usual adjustable cone c^3, with its washer and jam-nut, as shown.

C' C' represent the cranks, which are secured to the ends of the shaft C in any desired manner.

D represents a yoke which carries the bearing-sleeve for the forward pinion of the side shaft. This yoke (see Fig. 5) has a collar d, adapted to encircle the bearing-sleeve B and to abut against the end a of the crank-hanger. The collar d is preferably interiorly threaded and is screwed onto the said sleeve B; but it may be made plain. In any case it is clamped against the end a of the crank-hanger by a clamping-ring a^2. This yoke D is preferably made solid in its central portion, as shown at d', and at its rear end is provided with an interiorly-threaded cylindrical portion d^2, into which the bearing-sleeve E of the forward pinion is screwed.

The sleeve E is provided at each end with a ball-bearing e for a short shaft e', preferably hollow, which carries at its end the pinion e^2, said pinion being adapted to mesh with the driving-gear c'. By reference to Figs. 1 and 3 it will be apparent that the pinion e^2 can be adjusted longitudinally by rotating the sleeve E, and said sleeve will be clamped in its adjusted position by means of a set-screw, as shown, or other suitable means. The rear end of pinion-shaft e^2 (which is plugged, if a hollow shaft is used) is provided with a plurality of holes or recesses e^3, preferably four in number, to engage with suitable projections on the side shaft, as hereinafter described.

F represents a casing which surrounds the driving-gear c' and the main portion of the yoke D, said casing being riveted or otherwise secured to the wing d and crank-hanger and provided at the side of the machine with a removable face-plate f, screwed or otherwise detachably secured to the casing, and at its rear side with a cylindrical extension f', which is exteriorly threaded at its end.

G represents the casing for the pinion on the rear-wheel hub, said casing being provided with walls for inclosing the pinion. In the side walls g a threaded aperture is formed, into which the spindle h of the rear wheel is firmly screwed. Upon this spindle is placed one end of a yoke I, which carries the bearing-sleeve for the rear side-shaft pinion. This yoke is provided with a portion i, having inclined upper and lower faces i' i', and with a cylindrical interiorly-threaded portion i^2, into which the bearing-sleeve E', carrying its pinion e^2 and pinion-shaft e', is screwed. This sleeve, shaft, and pinion are

constructed in the same manner as the forward sleeve and its connected parts and need not be specifically described. The casing G is provided with forwardly-extending inclined walls g' g', which engage and support the inclined faces i' i' of the yoke I, and said casing is provided on its forward side with a cylindrical extension g^2, which is exteriorly threaded.

K is the removable side bar, which is tubular and provided at its forward end with an enlarged portion k and at its rear end with a similar enlarged portion k'. The portion k' is preferably interiorly threaded and screwed upon the threaded extension g^2 of the rear casing, and the forward enlarged portion k is united to the cylindrical extension f' of casing F by means of a reversely-threaded coupling-ring k^2, which is provided with right and left hand threads to engage right-hand threads on one of the meeting parts and left-hand threads on the other.

H represents the hub of the rear wheel, which is mounted upon the spindle h and provided with the usual ball-bearings.

L represents the stationary side bar of the frame, which is brazed or otherwise secured to the hanger A and is provided at its rear end with a perforated portion to engage the spindle h of the rear wheel in the usual manner.

The rear casing G is provided on its upper side with perforated ears g^3 g^3, to which is bolted one of the rear-fork bars of the bicycle-frame, as will be readily understood.

M represents the side shaft, which is provided at each end with projections m, having rounded ends, which enter the recesses in the pinion-shafts, and thus connect the side shafts with the pinions.

What I claim and desire to secure by Letters Patent is—

1. In a bicycle, the combination with the crank-hanger, of a bearing-sleeve detachably mounted within said hanger and carrying the crank-shaft bearings, the crank-shaft and the driving-gear thereon, a yoke secured to said sleeve and provided with an adjustable bearing-sleeve carrying the forward side-shaft pinion, the casing surrounding the driving-gear, and provided with an extension and the hollow side bar connected to said extension, substantially as described.

2. In a bicycle, the combination with the rear-wheel spindle, of a yoke secured thereto and provided with an adjustable sleeve carrying the rear side-shaft pinion, the rear hub mounted on said spindle and provided with a driving-pinion engaging said rear side-shaft pinion, a casing surrounding said driving-pinion and the hollow side bar secured to said casing, substantially as described.

3. In a bicycle, the combination with the crank-hanger, of a sleeve detachably mounted therein and carrying the driving-shaft bearings, the yoke secured to said sleeve and provided with an adjustable bearing-sleeve carrying the forward side-shaft pinion, the rear-wheel spindle, a yoke secured to said spindle provided with an adjustable bearing-sleeve carrying the rear side-shaft pinion, a casing secured to said spindle having an exteriorly-threaded portion, a casing for said driving-gear having a threaded cylindrical extension, a side shaft connecting said pinions, the hollow side bar provided at its rear end with an interiorly-threaded portion adapted to engage the threaded portion of the rear casing, and having exterior threads at its forward end, and a coupling-ring for connecting the forward end of said extension of the driving-gear casing, substantially as described.

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

HUGH McDONALD.

Witnesses:

THOS. A. DAVIES,

JOHN H. WATSON.