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Patented May 12, 1891.



J. H. Travel.
E. C. Bragg.



Cal V. Rhoades
William H. Rhoades
BY
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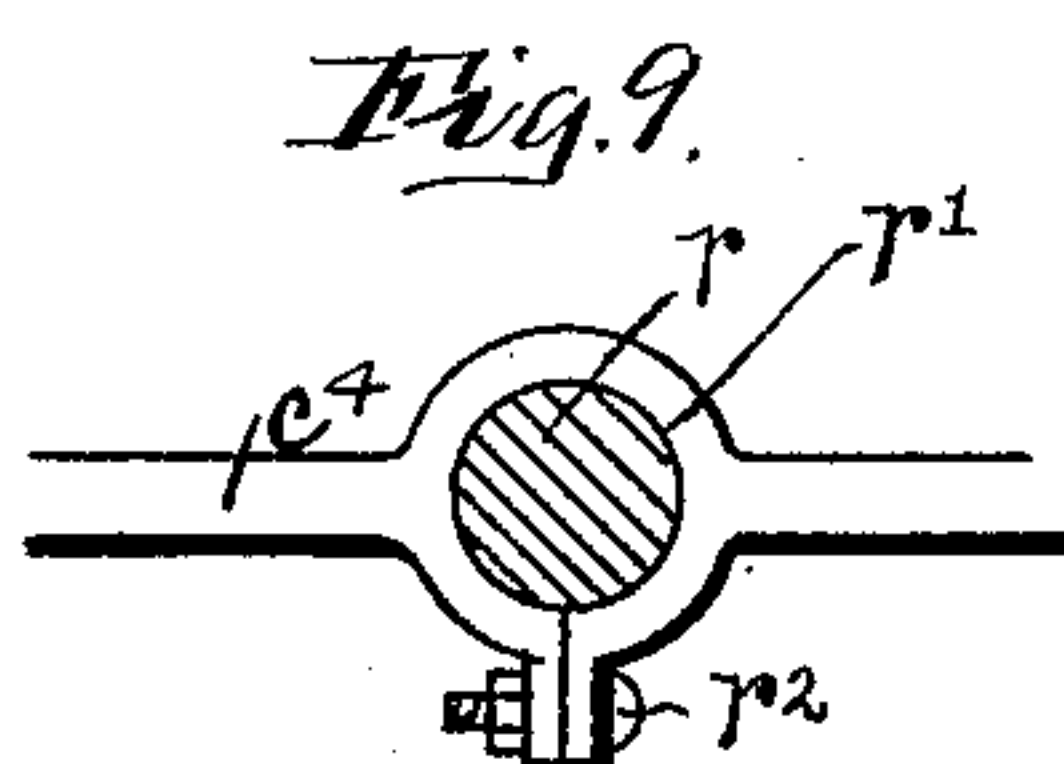
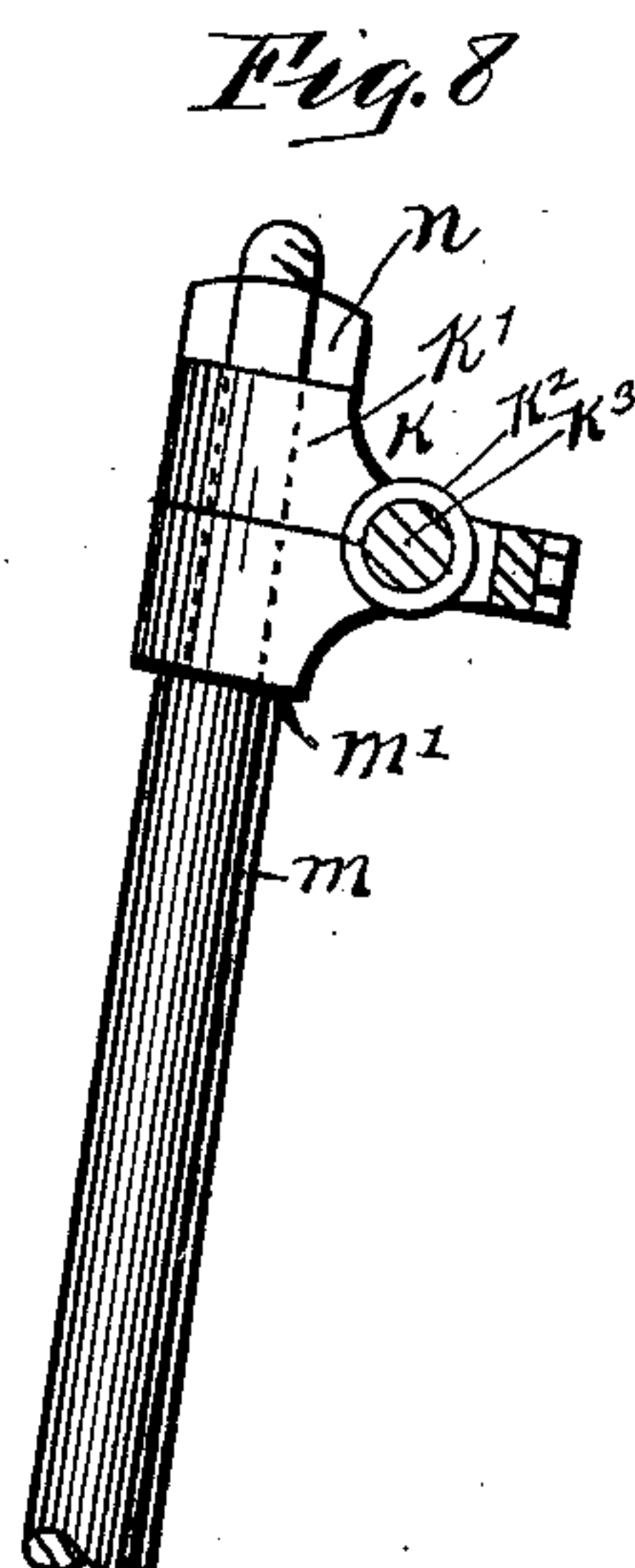
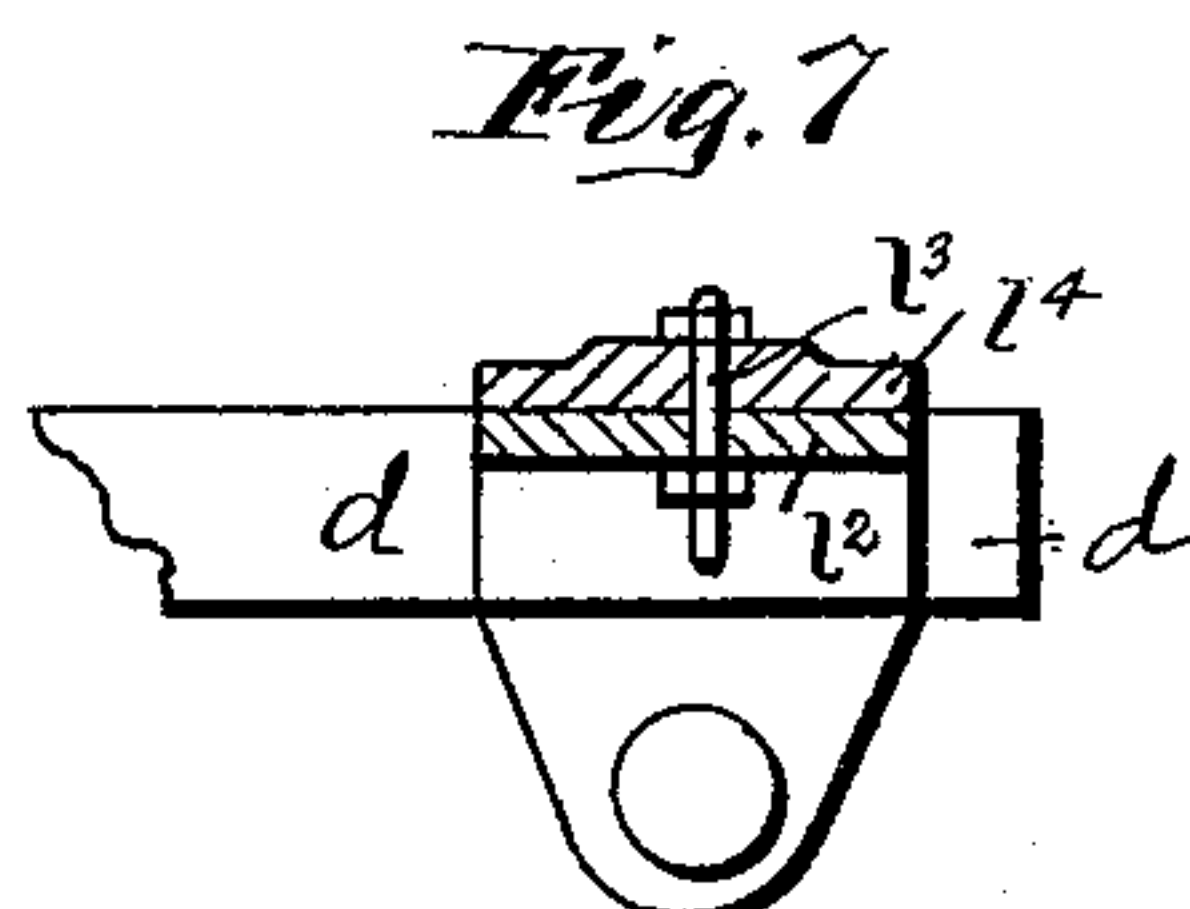
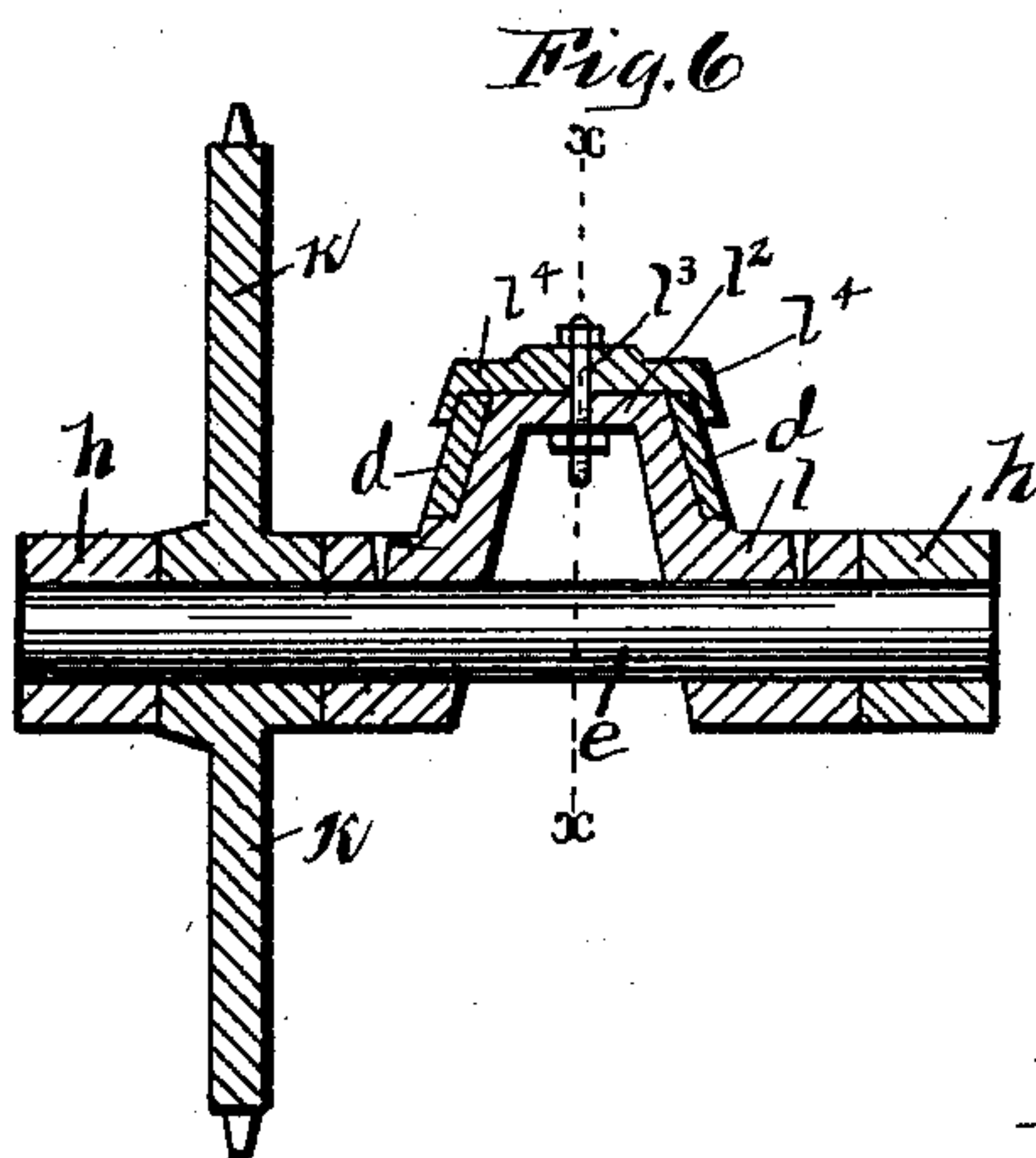
(No Model.)

2 Sheets—Sheet 2.

H. V. & W. H. RHOADES.
BICYCLE.

No. 452,195.

Patented May 12, 1891.



WITNESSES:

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UNITED STATES PATENT OFFICE.

HAL V. RHOADES AND WILLIAM H. RHOADES, OF COLUMBUS, OHIO,
ASSIGNORS TO THE COLUMBUS CYCLE COMPANY, OF OHIO.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 452,195, dated May 12, 1891.

Application filed May 21, 1890. Serial No. 352,596. (No model.)

To all whom it may concern:

Be it known that we, HAL V. RHOADES and WILLIAM H. RHOADES, citizens of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Bicycles, of which the following is a specification.

Our invention relates to the improvement of bicycles, and has particular relation to that class of bicycles known as the "Safety."

The objects of our invention are to construct a bicycle of this class in a simple, neat, and durable form; to provide a saddle of superior construction; to provide the bicycle with cone-bearings of superior construction and arrangement; to provide superior improved means for regulating the tension of the driving-chain; to provide an adjustable connection of the front-fork standard and handle-bar, and to produce said invention at such low cost of manufacture as to admit of the bicycle being placed on the market at a comparatively low figure. These objects we accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our improved bicycle. Fig. 2 is a central longitudinal section of the bicycle-seat. Fig. 3 is a plan view of the same. Fig. 4 is a central longitudinal section of one of the wheel-bearings. Fig. 5 is a section on line xx of Fig. 4. Fig. 6 is a similar sectional view of the pedal-shaft hub. Fig. 7 is a sectional view on line xx of Fig. 6. Fig. 8 is a transverse section of the handle-bar, and Fig. 9 is a transverse section of the adjustable seat-supporting arm, showing its connection with the main frame or backbone.

Similar letters refer to similar parts throughout the several views.

a represents the front and b the rear wheel of the bicycle.

c represents the main connecting-frame or backbone of the machine, which we preferably cast of malleable iron. This frame c may be produced in any desired form of open-work, and consists of the main arm c' , the rear fender-piece c^2 , which forms, as shown, a cover for the upper and forward portions of the rear wheel, an upright sleeve c^3 on the for-

ward end of the arm c' , and an upwardly-bowed cross-piece c^4 , which connects the arms c' and c^2 , and which, as hereinafter described, supports the seat-rod.

$d d$ represent the forwardly-extending and horizontal brace-arms which support the drive-wheel shaft and which have their forward terminations in front of the rear wheel b and have their rear ends connected in the usual manner with the ends of the rear-wheel axle b' .

e represents the pedal or drive-wheel shaft, the ends of which are rigidly connected with the ends of the pedal-arms h , said pedal-arms being of the usual form, and having mounted on their lower ends in the usual manner the ordinary forms of foot-pedals i . Rigidly mounted on the shaft e and abutting against the inner side of one of the pedal-arms h is a small sprocket drive-wheel k .

Loosely surrounding the shaft e , between the hub of the wheel k and the pedal-arm h , which is on the opposite end of the shaft from said wheel, is a hub l . The central portion of this hub is divided or bent upwardly to an approximately inverted-U shape, as shown in detail in Fig. 5 of the drawings. This inverted-U-shaped center or arched portion of the hub, which we have designated as l^2 is, as shown, inclined inwardly from its base, and is adapted to be inserted and fitted between the arms d at or near the outer ends thereof, said brace-arms being inclined to correspond with the inclination of the hub portion l^2 . The hub portion l^2 having been inserted, as described, upwardly between the arms d is clamped therein by means of a vertical bolt l^3 , which passes downward through a cap-plate l^4 , which fits over the top of the portion l^2 of the hub, and the downwardly-flanged lateral edges of which embrace the upper portions of the outer sides of the arms d . Through this connection of the hub and arms d the pedal-shaft is supported from said arms at the desired point in the length of the latter. The point of connection between the arms c' and c^2 of the frame is immediately in front of the central portion of the rear wheel, and said frame is rigidly connected at this point with the arms d , as shown.

g represents the front frame-fork, the diverging arms of which may be of the usual pattern.

m represents the upright fork-standard or guiding-shaft of the machine, which passes upwardly from the front forks loosely through the frame-sleeve *c*³.

k represents a handle-bar clamping-piece, consisting of a short vertical sleeve *k'*, on the rear side of which is formed a short horizontal sleeve *k*². The sleeve *k'* is split or divided transversely, said split extending to the inner side of the sleeve *k*². The vertical portion of the sleeve *k* is made to surround the upper and smaller portion of the guiding-rod *m* and rest upon a shoulder *m'* formed in said rod.

Through the horizontal sleeve *k*² is made to pass the central portion of the handle-bar *k*³. The handle-bar having been turned until its handles project at right angles, the nut *n* is screwed upon the upper screw-threaded end of the rod *m* and turned thereon until the divided halves of the clamping-piece *k* are sufficiently clamped together to firmly grasp and hold the handle-bar.

The lower ends of the fork *g*, which terminate on opposite sides of the center of the forward wheel, are each provided with a transverse screw-hole, into which is screwed, as shown, a bearing-plug *p*, which has formed in its inner end a conical depression *p'*.

q represents the forward-wheel hub, within which is journaled the wheel-axle *q'*. This axle projects at each end beyond the end of the hub and has said projecting end portions formed cone-shaped, as shown. These cone-shaped axle ends enter and bear within the conical depressions *p'* of the screw-threaded plugs *p*. Through the centers of the plugs *p* and the axle *q'* passes loosely an adjusting rod or bolt *q*², one or both ends of which may be provided with an adjusting-nut *q*³, which bears against the outer sides of the plugs *p*. By turning this nut *q*³ the fork ends may be forced inward or outward, as may be desired, to regulate the contact between the cone-shaped axle and their socket-pieces.

r represents the seat-supporting rod or arm, the upper portion of which is bent, as shown, at right angles with its vertical body. The vertical portion of the rod *r* is adjustably supported in a split or divided socket *p'*, formed in the arm *c*⁴ of the frame. On each side of the split of the socket is formed an outwardly-projecting flange, said flanges being drawn together or sufficiently near each other to hold firmly the rod *r* by bolts *r*². The upper and horizontal portion of the rod *r* passes, as shown, through a rod-hole formed through lug *s*, which depends from the center of a metallic plate *s'*. A set-screw *s*² serves to hold the rod *r* in adjustable connection with the lug *s*. The plate *s'* is, as shown, made to support a saddle-frame of peculiar construction. The forward portion or half of the saddle-frame is formed of one piece of spring-wire *t*.

This wire *t* has its central portion bent to form on each side of its center a coil-ring *t'* and has its central portion between said coils bent or looped rearwardly to form, as shown, a catch for hook *t*², which projects outwardly from the front end of the saddle-top or cover-piece *t*³. From the coils *t'* the two arms of the wire *t* are bent rearwardly and have their rear end portions secured upon the plate *s'* near opposite ends thereof, as hereinafter described.

The rear half of the seat-frame is composed of two sections or pieces of spring-wire *u*, each having its forward end resting upon the plate *s'* and adjacent to the wires *t*, and each having its rear portion terminating in an upward coil *u'* and forwardly-extending coil end. These coil ends each enter a hole formed in the lower end of a pin or hanger *u*², both of which depend from a transverse stiffening or supporting plate *u*³, which conforms to the shape of the rear portion of the saddle-top, and to which the latter is secured. The loop ends are clamped in said hangers by set-screws *u*¹. The forward end of the rear seat wires or rods *u* and the rear ends of the forward rods *t* are, as shown, clamped side by side on the plate *s'* by means of hook-bolts *s*³, the screw-threaded portions of which pass downward through the plate *s'*, and the hook-shaped upper ends of which clamp against the upper sides of the seat-frame wire end portions.

From the method hereinbefore described of connecting the driving-wheel or pedal-shaft with the frame it will be seen that in case the driving-chain *k'*, which, as usual, connects the drive-wheel *k* and a small sprocket-wheel on one end of the rear axle *b'*, should become slack it may be readily tightened by removing the bolt *b* and sliding the hub *l* farther forward on the arms *d* and again inserting the bolt.

From the description hereinbefore given of the axle-bearings it will be seen that the conical bearing depression, instead of being formed, as is usual, in the axle, is formed in the plug *p*. As a result of this reversal in the bearings, it will be seen that in case the conical bearing-seat should become worn or unfit for use the plug *p* may be unscrewed from the fork *n* and a new one substituted with but slight trouble and expense. It will also be observed that by the construction shown and heretofore described the pressure or frictional contact between the axle and its bearing-pieces may be reduced or increased by turning the nut *q*³.

It is obvious that the form of spring supporting-frame for the saddle herein shown will produce a strong and comfortable support, the arrangement of the spring-rods being such as to produce a central bearing therefor and result in the seat or saddle top being suspended between spring-coils which will impart the desired flexibility to the said seat. It will also be seen that in case one of the

5 seat-spring rods should be broken it may readily be replaced at a slight expense, and that the manner of connecting the seat-frame and seat-supporting rod is simple and reliable.

10 In case it is desired to lower or elevate the seat-rod r it may be accomplished by loosening the screws r^2 and thus increasing the size of the socket r' sufficiently to allow for the upward or downward movement of the rod r , which may again be firmly clasped in said socket by tightening said screws.

15 From the construction and arrangement of the various parts composing our improved bicycle it will be seen that the parts are few and that no complicated joints or connections are involved, which would involve great expense or extreme accuracy in the manufacture of the same.

20 The formation of the main frame, arms c' c^4 c^2 , the sleeve c^3 , and the socket r^2 in one cast piece will greatly reduce the expense in the construction of a bicycle and at the same time give the machine-frame a neat and substantial appearance.

Having now fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a bicycle, the combination, with the front and rear wheels and a driving mechanism connected with said rear wheel, of a main frame or backbone including the arms c^2 and c' , the fork-arm sleeve c^3 , and split socket r' , all cast in one piece, substantially as described. 30

2. In a bicycle, the combination, with the front and rear wheels, rear-wheel pedal-supporting frame d , and a connecting-frame between said wheels, of the pedal-shaft e , carrying drive-wheel k , a belt connection between said drive-wheel and rear-wheel axle, and hub l , loosely surrounding shaft e and having upwardly-projecting portion l^2 , the latter detachably and adjustably connected with arms d , substantially as described. 35 40

HAL V. RHOADES.

WILLIAM H. RHOADES.

In presence of—

BARTON GRIFFITH,

C. C. SHEPHERD.