

UNITED STATES PATENT OFFICE.

FRANK E. SOUTHARD, OF TOLEDO, OHIO.

TRICYCLE.

SPECIFICATION forming part of Letters Patent No. 545,105, dated August 27, 1895.

Application filed April 12, 1894. Serial No. 507,254. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. SOUTHARD, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented certain new and useful Improvements in Tricycles, of which the following is a specification.

My invention relates to a novel construction of the bearings and the supports of the frames of tricycles; and its object is to simplify and cheapen the production of machines of this class. I attain this object by means of the device hereinafter described, and shown and illustrated in the accompanying drawings, made part hereof, in which—

Figure 1 is a perspective view of a tricycle, illustrating a mode of applying my invention; Fig. 2, a side elevation of one of the brackets hereinafter referred to with a section of one of the ball-retaining caps removed; Fig. 3, a front elevation of the same, partly in section; and Fig. 4, a sectional view of the same, taken on line *x x*, Fig. 2.

Like letters indicate like parts throughout the several views.

In the drawings, A represents the crank-shaft upon which the frame of the tricycle rests, and by means of which the tricycle is driven, said crank-shaft engaging one or both of the main wheels of the machine. Shaft A is journaled in pieces B, which serve not only as journal-boxes, but as brackets for the backbone-braces and as sockets for the seat-supporting standards. The pieces B, more in detail, are made of malleable cast-iron, have a cylindrical body *c*, having a horizontal axial bore *c'* for the reception of shaft A. Each end of axle-box *c* is formed with a cup-like recess *c²* for the reception of antifriction-balls. To facilitate the casting of piece B one of the recessed ends of the axle-box is cast integral with the piece, while the recess at the other end of the box is formed by means of a correspondingly-recessed collar *d*, which is slipped over the end of the box and secured, preferably, by shrinking the collar in place. Into the recess at each end of the axle-box is slipped a cup-shaped plate *e*, preferably of steel, the mouth of the cup being placed inwardly. Plates *e* have a hole in their center coinciding with the bore of the axle-box. The annular chamber, formed by

fitting the cup-shaped plate *e* into recess *c²*, is filled with a circle of antifriction-balls *f*, thus forming a ball-bearing for shaft A. The plate *e* and balls *f* are secured against displacement by inwardly upsetting the projecting edge or flange of axle-box *c* upon plate *e*, as at *g* in Figs. 3 and 4. This method of securing the plate *e* in recess *c²* is necessary, because of the impracticability of successfully forming and using fine screw-threads cut upon malleable cast-iron, and its advantage is that the plate *e* is quickly, cheaply, and securely fixed in position. Cast integral with each cylindrical body *c* is a second cylindrical portion *h*, having a vertical axial bore, into which seat-supporting standard *i* is slipped, this standard being held at any desired height by means of set-screw *k*. There is also cast integral with portions *c* and *h* an arm *l*, extending forward and downward, and an arm *m*, extending upward and backward, each of these arms having at its outward extremity an eye *l' m'*. The eyes *l'* receive braces *l²*, which are connected near its center with the backbone *n* of the machine. The eyes *m'* receive piece *m²*, which serves as a tie between the bracket-pieces B and as a brace and support for the rear end of the backbone *n*.

It will be seen that the bracket-pieces above described form light, compact, strong, and cheap seat-supports, holders for backbone-braces, and journal-box for driving-shaft, and that by means of my device the ball-bearings may be placed in said bracket-piece, instead of in the wheel, as heretofore, thus permitting the use of common or cheap wheels in a ball-bearing tricycle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein described axle-box or bearing, comprising a body (*c*), formed of malleable cast iron, having an axial bore and an enlarged recess at each end thereof, in combination with cup-shaped caps (*e*), disposed in said recesses with their mouths toward each other, anti-friction balls in the annular chambers formed by said caps, and flanges or lips upset upon the projecting edges or flanges of the axle-boxes (*c*), whereby the cups (*e*) are secured in place, substantially as and for the purpose specified.

2. In an axle-box or bearing, a cylindrical body formed of malleable iron, having an axial bore, an enlarged recess at one end thereof and a sleeve at the opposite end of said cylindrical body having a corresponding recess, in combination with cup-shaped caps or plates (*e*) disposed in said recesses with their mouths toward each other, anti-friction balls in the annular chambers formed by said caps, and flanges or lips upset upon the projecting edges or flanges of the axle-boxes (*c*), whereby the cups (*e*) are secured in place, substantially as and for the purpose specified.

3. In a tricycle, a bracket-piece, formed of malleable cast iron, having an axle-box provided with a recess at one end and a corresponding recessed sleeve at the other end,

cup-shaped caps in said recesses disposed with their mouths toward each other, anti-friction balls in the annular chambers formed by said caps, and flanges or lips upset upon the projecting edges or flanges of the axle-boxes (*c*) upset inwardly, whereby the cup (*e*) is secured against displacement, sockets for seat standards on said bracket-pieces and brace-arms (*l m*) on said bracket-pieces, in combination with the driving shaft and wheels of said tricycle, all substantially as and for the purpose specified.

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Witnesses:

CLEMENT CARPENTER,

L. E. BROWN.