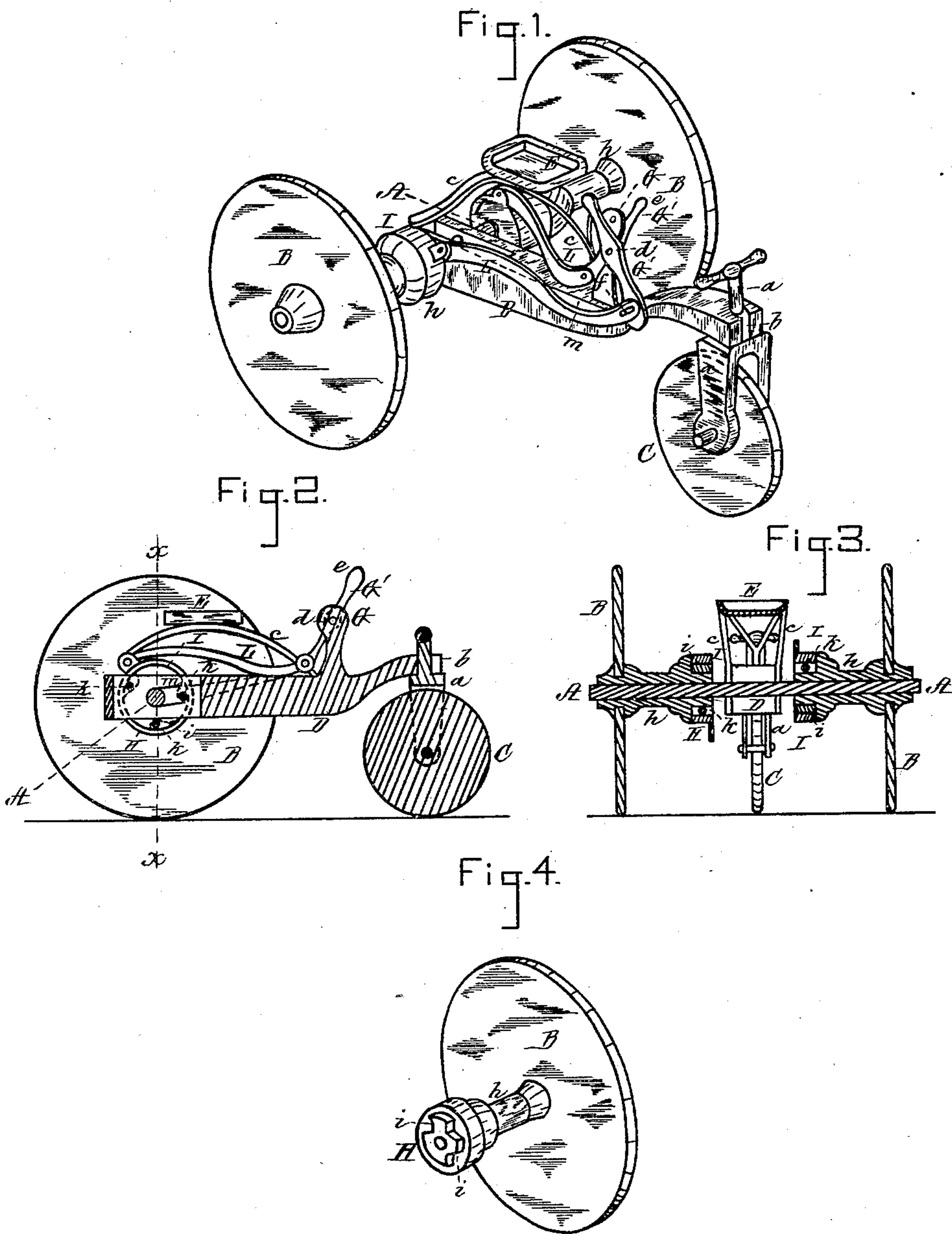


(No Model.)

L. HALL.  
TRICYCLE.

No. 318,725.

Patented May 26, 1885.



WITNESSES.

D. C. Bates.  
H. W. Stearns.

INVENTOR.

Luther Hall,  
per Norman W. Stearns,  
Att'y.



# UNITED STATES PATENT OFFICE.

LUTHER HALL, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO  
HENRY C. WILLIS, OF SAME PLACE.

## TRICYCLE.

SPECIFICATION forming part of Letters Patent No. 318,725, dated May 26, 1885.

Application filed February 28, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, LUTHER HALL, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Tricycles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a tricycle constructed in accordance with my invention. Fig. 2 is a longitudinal vertical section through the center of the same. Fig. 3 is a transverse section on the line *x x* of Fig. 2. Fig. 4 is a perspective view of a driving-wheel with a long hub extending inwardly and having a portion of my clutching device formed integral therewith.

My invention has special reference to the propelling mechanism of a tricycle, one of the leading features of which consists in a portion of a specific clutch mechanism formed integral with or secured to the inwardly-extended hub of each of the pair of driving-wheels rotated on their common axle, whereby a steady, prompt, and rapid motion may be imparted, and lightness, great simplicity, and maximum strength secured.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents a stationary axle; BB, the two driving-wheels free to rotate thereon; C, the guide or steering wheel journaled in the bottom of the shank or post *a*, which passes up through and is adapted to turn in a socket, *b*, in the forward end of the reach or backbone D, the rear of the latter being supported by the axle which passes through it.

E is the seat or saddle, mounted, preferably, on arched spring-braces *c*, extending up from and over the reach.

To each side of a standard, G, rising from the reach is pivoted, at *d*, an upright lever, G', the top of which is finished as a handle, *e*, for the application of the hand thereto, the bottom of said lever being provided with a suitable foot-rest or pedal, *f*, all of the foregoing-mentioned parts being of well-known construction.

Each driving-wheel B B has immovably secured thereto, so as to revolve in common therewith, a long hub, *h*, extending inwardly toward the reach, and formed integral with the hub, or permanently fixed thereto, is a portion, H, provided with a series of inclined faces, *i*, separated by recesses—or, in other words, a series of inclined notches—and surrounding this notched portion H is an annular loose-fitting sleeve, I, adapted to turn freely thereon, the spaces between the inner periphery of the sleeve and the inclined faces of the portion H being for the reception of a series of hard-steel spherical balls or rolls, *k*. (See Figs. 2 and 4.) The portion H, its surrounding sleeve, and the balls or rolls *k* constitute a clutch, with which each wheel-hub is provided, the two clutches being independent of each other and having alternate action, to give a continuous rotation to the driving-wheels B B in a forward direction by means of connecting-rods L, extending from the outer peripheries of the sleeves to the lower ends of the upright levers G'.

One or both hands may be applied to the operating lever or levers G' G', with or without the simultaneous action of one or both feet; or only one foot may be employed, according to the rate of speed desired, or when turning a curve.

When the sleeve of one clutch is rotated forward upon the portion H, (fixed to or formed integral with its hub,) one or two of the balls or rolls descend by gravity to the narrow portion of the spaces or recesses in which they are located—*i. e.*, each ball or roll referred to runs in a direction away from the center or axis of rotation and becomes wedged tightly between the outer end of its incline and the contiguous inner periphery of that portion of the sleeve surrounding it, the result being that the sleeve with the portion H of the hub within it are firmly locked together, and when the sleeve is rotated in the direction of the arrow a forward movement is imparted to its driving-wheel, simultaneous with which, the lower end of the opposite operating-lever being carried backward, the other sleeve with which it is connected is rotated in a direction opposite that of the arrow, and the balls or rolls in the spaces or recesses of the portion H of the other



wheel-hub, rolling into the wider parts thereof, unlock its hold on the hub until the first clutch has released its grip on the first-mentioned driving-wheel, immediately upon which  
 5 the second clutch commences to engage with the second driving-wheel, and it is by this alternate action of the clutches that a uniform, continuous forward movement is imparted to the vehicle.

10 The lower ends of the working-levers are connected by a cord, band, or wire, *m*, passing around the axle, which arrangement insures the backward vibration of one connecting-rod *L* simultaneous with the forward vibration of  
 15 the other when power is applied to only one of the working-levers by the action of one foot, with or without the use of one hand. The connection *m* is capable of being instantly detached, whereby, when going uphill, both  
 20 hands and feet may be applied independently, in order to obtain sufficient momentum to climb the upward grade.

In the application of my invention to a bicycle both clutches could be applied to the  
 25 same or to opposite sides of the hub, it being simply necessary to set the clutches in such manner that one will be disengaged while the other is engaged in its hold on the hub.

By having each driving-wheel provided with  
 30 a long hub projecting inward an extended bearing on the non revolving axle is afforded, which obviates any tendency to lateral unsteadiness

incident to short hubs. Furthermore, by securing the notched portion *H* of a clutch to or forming it integral with the hub, prompt ac- 35  
 tion and a rapid continuous motion are imparted to the driving-wheels, besides which simplicity, lightness, and strength of construction are insured.

The axle may be secured to the hub, so as to 40  
 revolve in common with the driving-wheels, without departing from my invention.

I claim—

1. The following coacting elements, viz: the driving-wheels *B B* of a tricycle, provided with 45  
 long hubs *h h*, extending inwardly toward each other, and having secured thereto or formed integral therewith the notched portions *H H*, sleeves *I I*, surrounding the same,  
 50 balls or rolls *k k k*, interposed between the sleeves and notched portions, a pair of connecting-rods, *L L*, and a pair of working-levers, *G G*, combined to operate substantially as and for the purpose described.

2. In combination with the upright levers 55  
*G' G'*, the connection *m*, extending between them and around the axle of the driving-wheels, as and for the purpose set forth.

Witness my hand this 18th day of February, 1885.

LUTHER HALL.

In presence of—

N. W. STEARNS,

E. J. PARKER.