

(No Model.)

2 Sheets—Sheet 1.

J. A. DEERING.
VELOCIPED.

No. 309,933.

Patented Dec. 30, 1884.

Fig. 1.

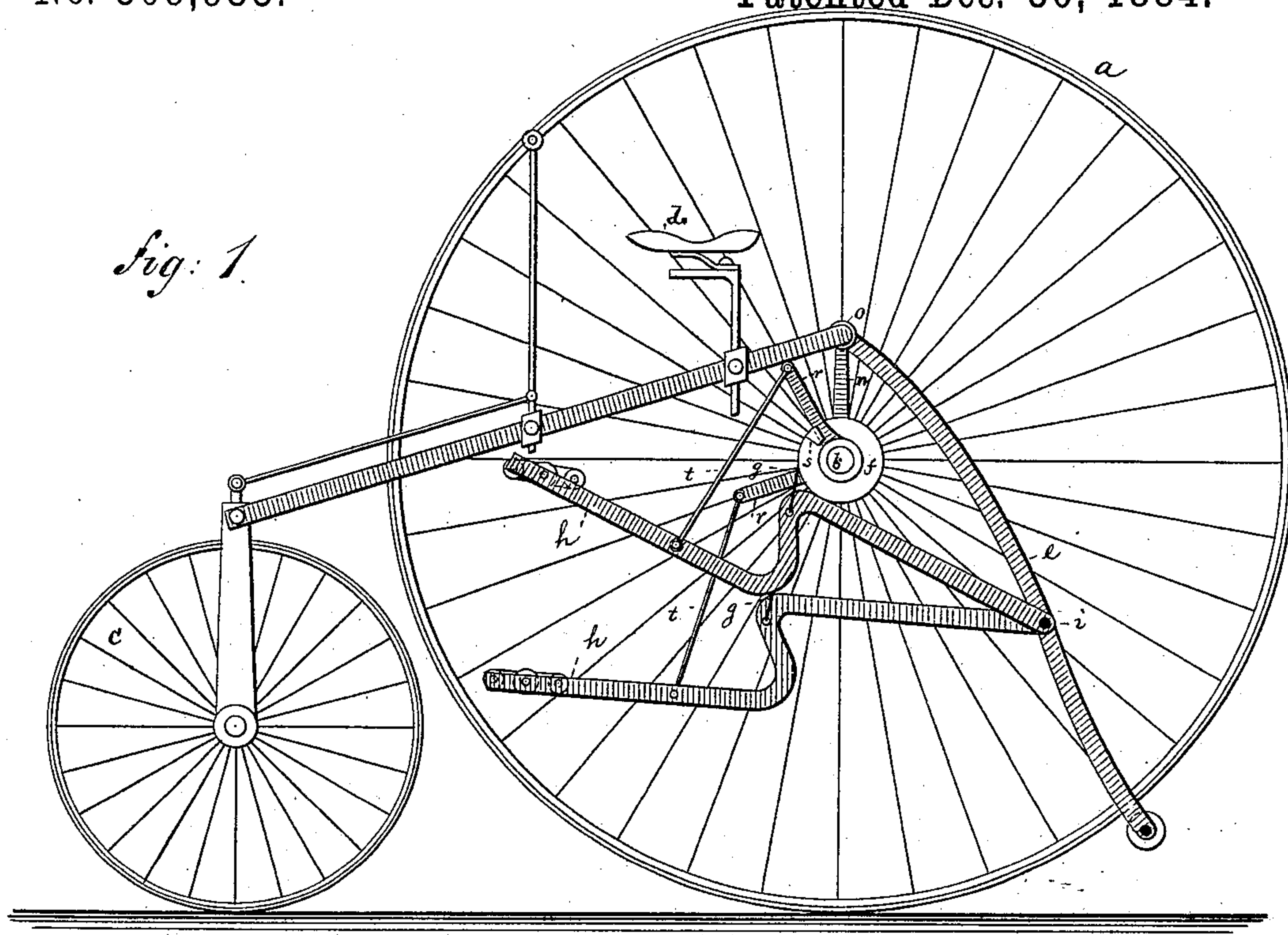
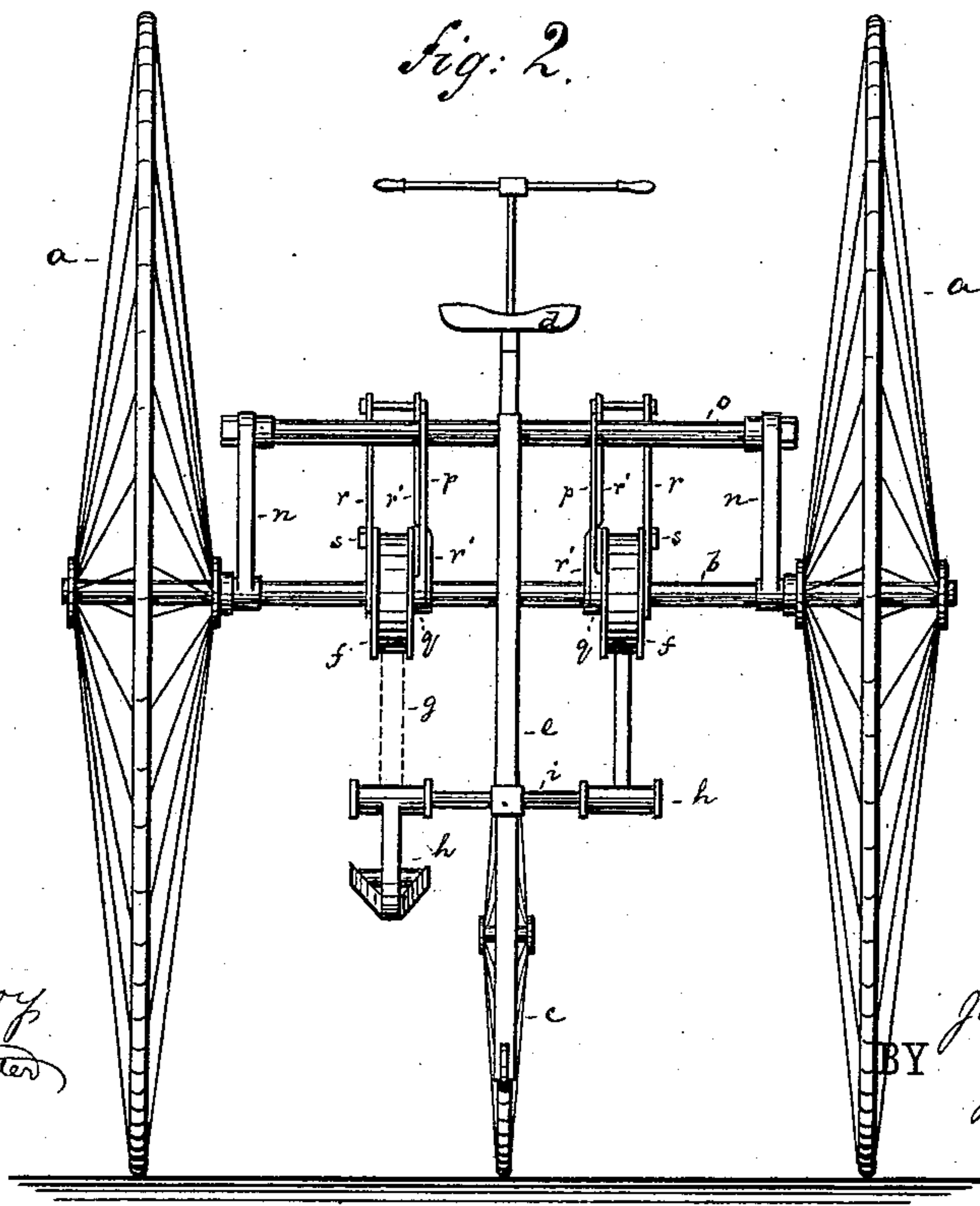


Fig. 2.



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Fig. 3.

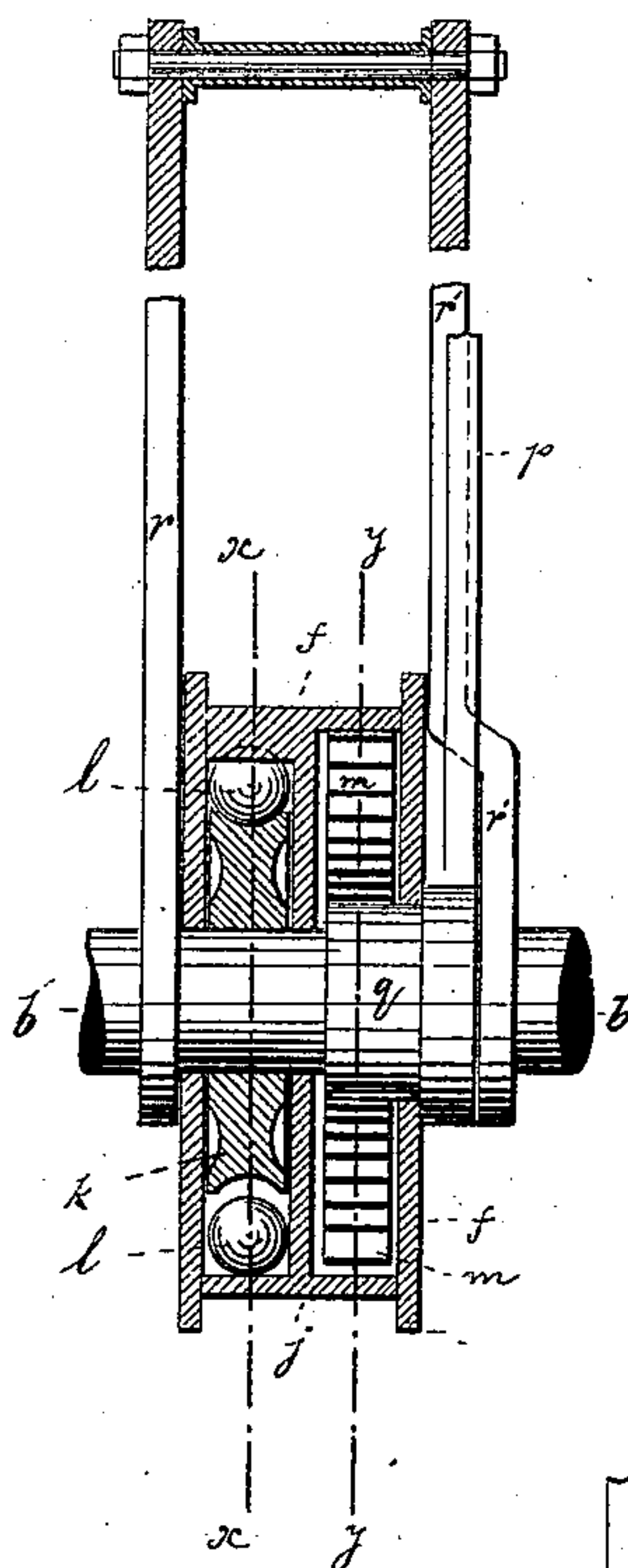


Fig. 4.

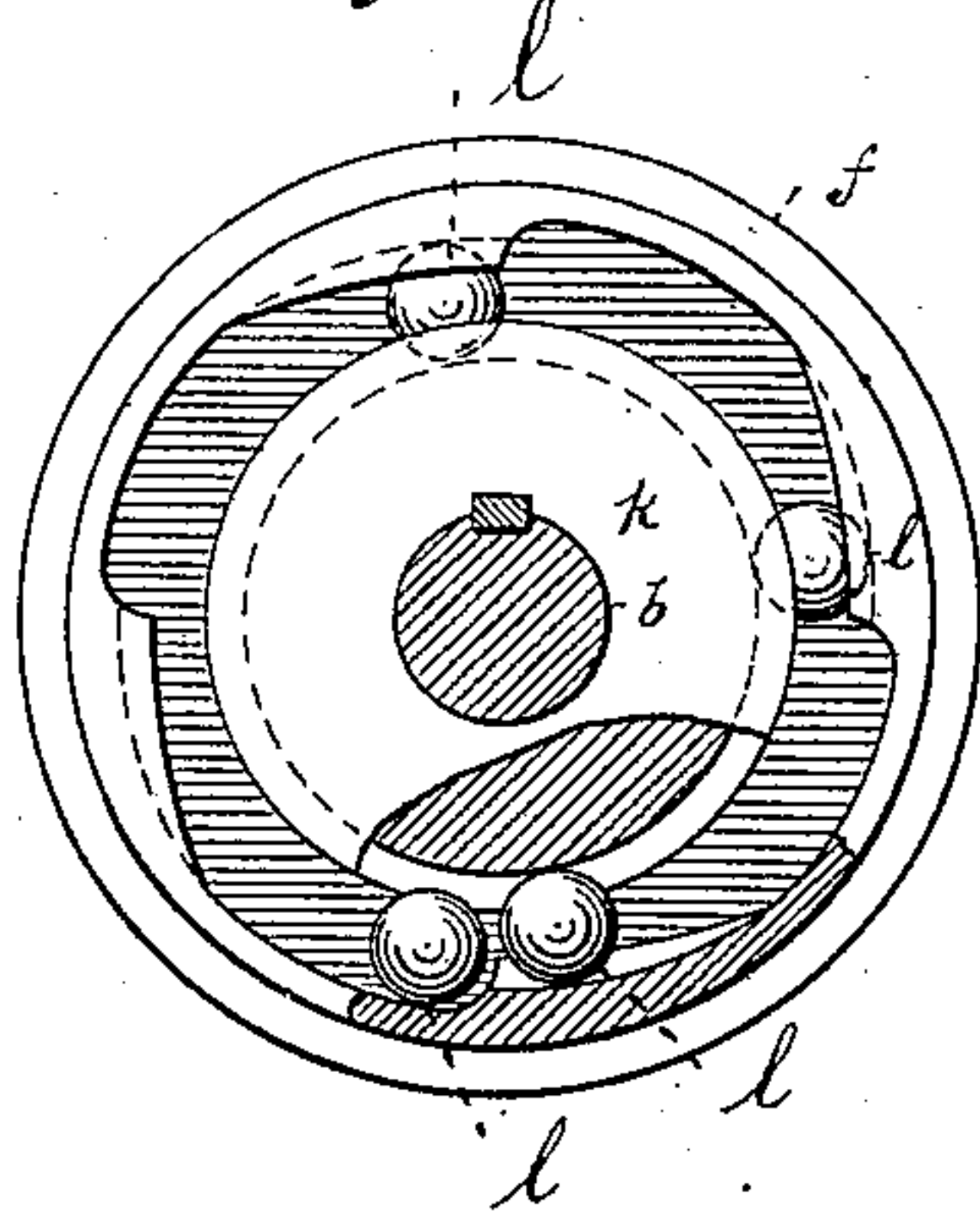


Fig. 5.

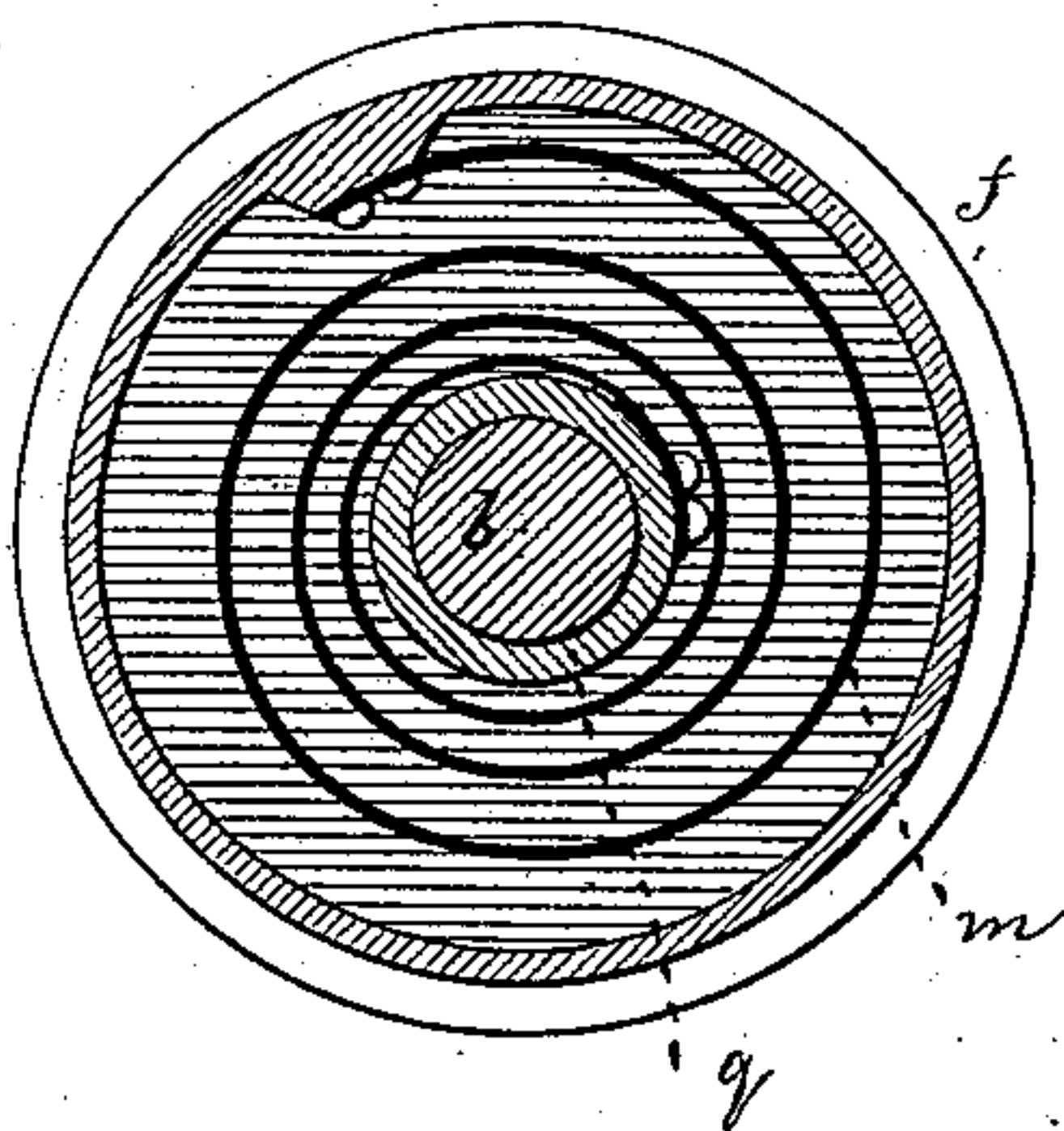


Fig. 6.

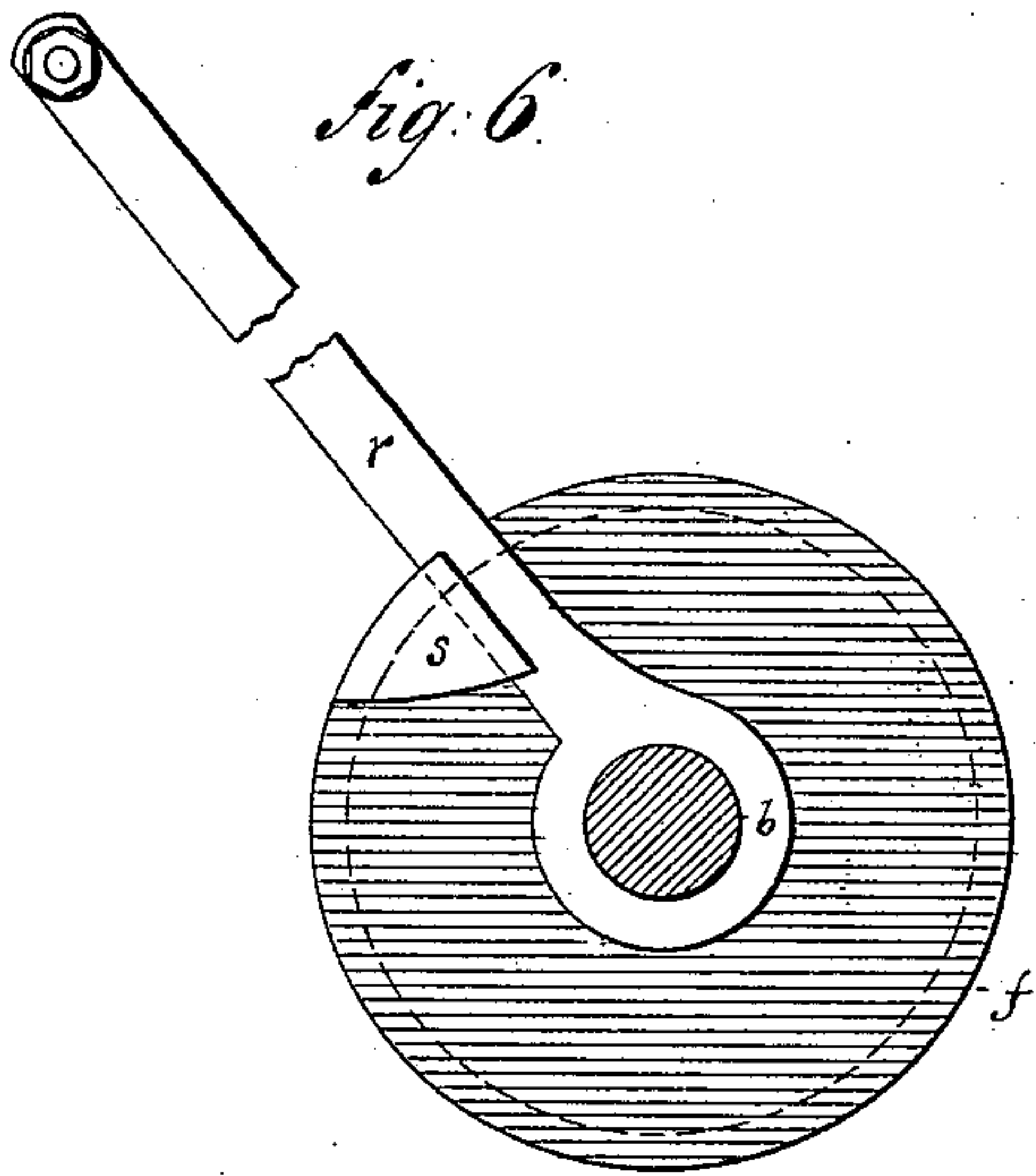
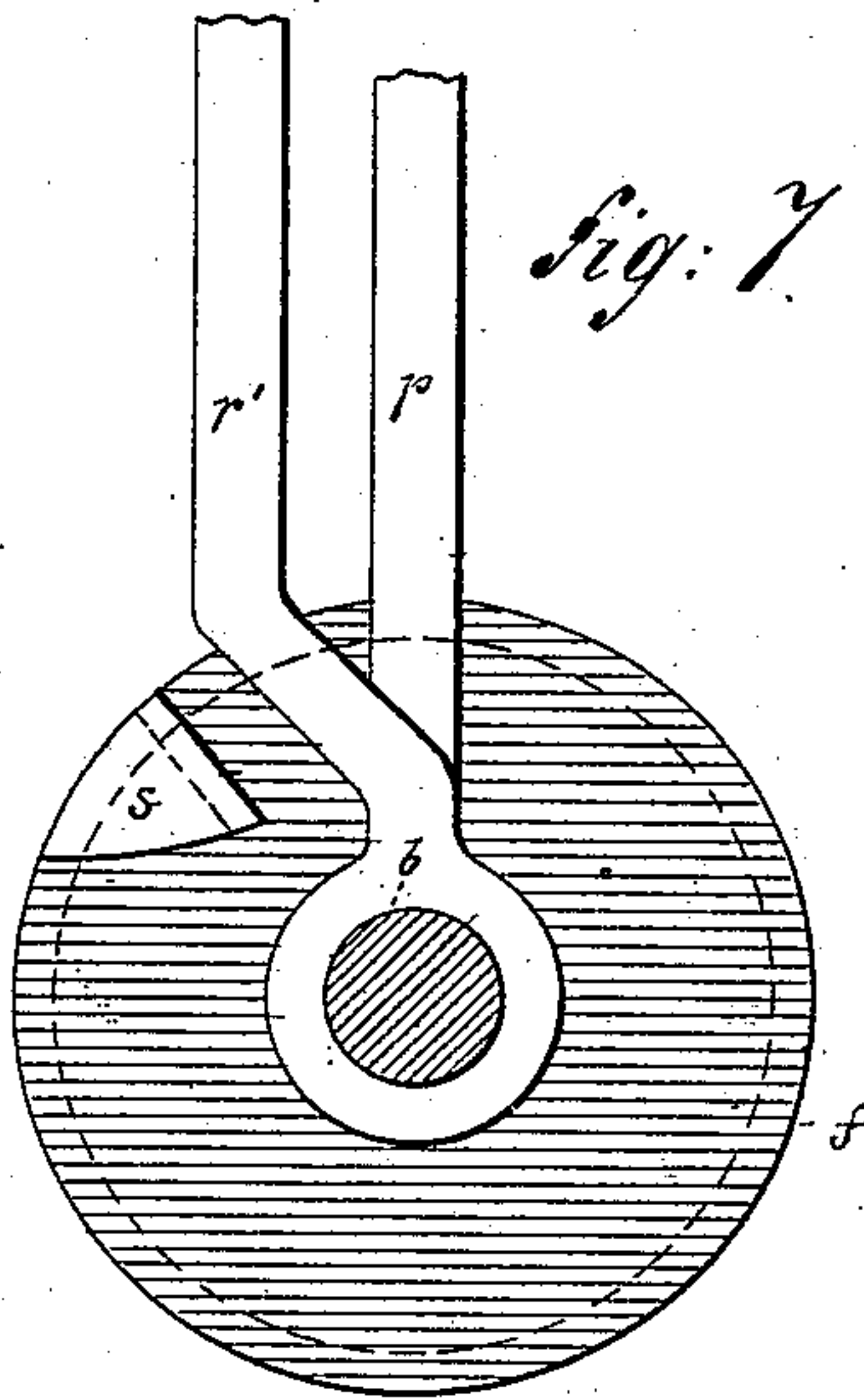


Fig. 7.



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UNITED STATES PATENT OFFICE.

JAMES A. DEERING, OF NEW YORK, N. Y.

VELOCIPEDÉ.

SPECIFICATION forming part of Letters Patent No. 309,933, dated December 30, 1884.

Application filed August 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. DEERING, of the city of New York, in the county and State of New York, have invented a new and Improved Velocipede, of which the following specification is a full, clear, and exact description.

This invention relates to various improvements in velocipedes, and more particularly to the mechanism for transmitting motion to the driving-wheels. It has been shown to be applied to a tricycle; but it may also be used in connection with bicycles and other velocipedes.

The invention consists in the various details of construction hereinafter pointed out.

In the accompanying sheets of drawings, Figure 1 is a sectional side view of a tricycle provided with my improvement. Fig. 2 is a back view of the same; Fig. 3, a detail transverse section of one of the boxes containing the motion-transmitting mechanism; Fig. 4, a longitudinal section on line *x x*, Fig. 3; Fig. 5, a similar section on line *y y*, Fig. 3; Fig. 6, an outer sectional side view of the box, and Fig. 7 an inner sectional side view of the same.

The letters *a* represent the driving-wheels keyed to axle *b*.

c is the steering-wheel, *d* the seat, and *e* the backbone, all as customary.

f f are two boxes encircling the axle *b*, and free to turn thereon. *g* are straps attached to the circumferences of the boxes *f* at one end, and to the treadles *h* at the other end. These straps encircle the boxes, and by alternately stepping on treadles *h* the boxes are revolved, and thereby revolve axle *b* in manner hereinafter described. The treadles *h* are pivoted to a cross-bar, *i*, attached to backbone *e*, and are made of the peculiar shape shown in Fig. 1—that is to say, they project first forward, and are then bent downward and backward at an acute angle, and are then again bent forward. The vertical part of each treadle has an inward or backward curve, so that a shoulder is formed above the heel, against which the top of the heel rests. In this way the foot is held upon the treadle and prevented from slipping upward during the upward motion of the treadle. Each box *f* is, by a partition, *j*, divided into an inner and an outer (or right and left) chamber. The outer chamber surrounds

a disk, *k*, tightly keyed around shaft *b*, and having a grooved periphery, Fig. 3. Between this disk and the inner periphery of the chamber a channel or way is formed, and into this channel four (more or less) balls, *l*, are loosely placed. The channel is composed of as many sections as there are balls, and these sections are widest at one end and taper gradually toward the other end. This construction I obtain by forming the inner periphery of the chamber in the arcs of four (more or less) circles, all eccentric to axle *b*, Fig. 4, the contracted end of one arc communicating with the widest portion of the next arc. This inner periphery should also be provided with a central groove, Fig. 3, so that the balls *l* cannot slip sidewise. The inner chamber of each box *f* contains a coiled spring, *m*, attached at one end to said chamber and at the other end to any fixed support. This support I obtain as follows:

From each side of axle *b* projects upwardly a standard, *n*, the lower bearings of the standards encircling the axle, so as not to revolve therewith. At the upper ends the standards are connected to a cross-bar, *o*, from which project downward the arms *p*, having each at its lower end a sleeve, *q*, loosely encircling axle *b*, and projecting into the inner chambers of the boxes *f*, Fig. 3. To these sleeves one of the ends of each spring *m* is attached.

The operation of the device is as follows: As one of the treadles *h* is depressed, the strap *g* will revolve the box *f*, to which it is attached, forward. Then one or more of the balls *l* in this box, owing to their gravity, will fall downward in their tapering channels, and become clamped in the contracted portion thereof. The frictional contact between box, balls, and disk *k* will now cause the box, by means of the balls, to grasp the disk and pull it around with it. Thus the rotary motion is transmitted to the disk, and accordingly to axle *b*. When pressure on treadle *h* is released, the spring *m* will come into play and revolve the box backward as the treadle is raised, the balls *l* falling into the wider parts of the channel. Thus strap *g* is again wound upon the box, and the parts are in proper position for the next descent of the treadle.

In order to obtain an additional tight grasp

upon the axle in the ascent of hills, I have devised the following construction: To the right and left of each box *f* extends an upright, *r r'*. Each pair of these uprights is connected on top, while at their bottom all the uprights have a transverse bore to loosely encircle axle *b*. *s* is a plug or stop affixed to the cheeks or side pieces of each of the boxes *f*. The inner uprights, *r'*, have each an outer bend, so that their upper ends are inside of the arms *p*, Figs. 2 and 3, while their lower ends are outside of such arms. Thus it will be seen that all uprights *r r'* are in close proximity to the sides of boxes *f*, near the periphery of such boxes. At the top each of the outer uprights, *r*, is connected by a rod, *t*, to treadle *h*. The connection between treadle and rod *t* is formed by hook and eye, or in equivalent manner.

Under ordinary circumstances—such as travel on level ground—the uprights are entirely out of play; but when additional purchase is desired the rods *t* are connected to treadles *h*. The uprights *r r'* will now bear against the stop *s* of boxes *f* as the treadles are depressed, and aid in revolving such boxes. On the raising of the treadles the rods *t* will oscillate uprights *r r'* backward, so as to be in proper position for the next depression of the treadles.

In place of making the inner periphery of box *f* with the eccentric curves, such curves may be formed on the outer periphery of disk *k*.

I claim as my invention—

1. The combination of axle *b*, rigidly connected to driving-wheels *a* and disks *k*, with boxes *f*, containing loose balls *l* between eccentric curves adapted to clutch the axle, and a coiled spring, *m*, attached with one end to the box and with the other end to a fixed support, substantially as specified.

2. The combination of axle *b* with box *f*, balls *l*, standards *n*, cross-bar *o*, arm *p*, sleeve *q*, and spring *m*, substantially as specified.

3. The combination of axle *b* with box *f*, having stop *s*, and with uprights *r r'*, rods *t*, and treadles *h*, substantially as specified.

4. The combination of axle *b* with uprights *r r'*, boxes *f*, arms *p*, stops *s*, rods *t*, and treadles *h*, the rods *r'* being bent near their lower end to pass outward of arms *p*, substantially as specified.

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Witnesses:

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