

(No Model.)

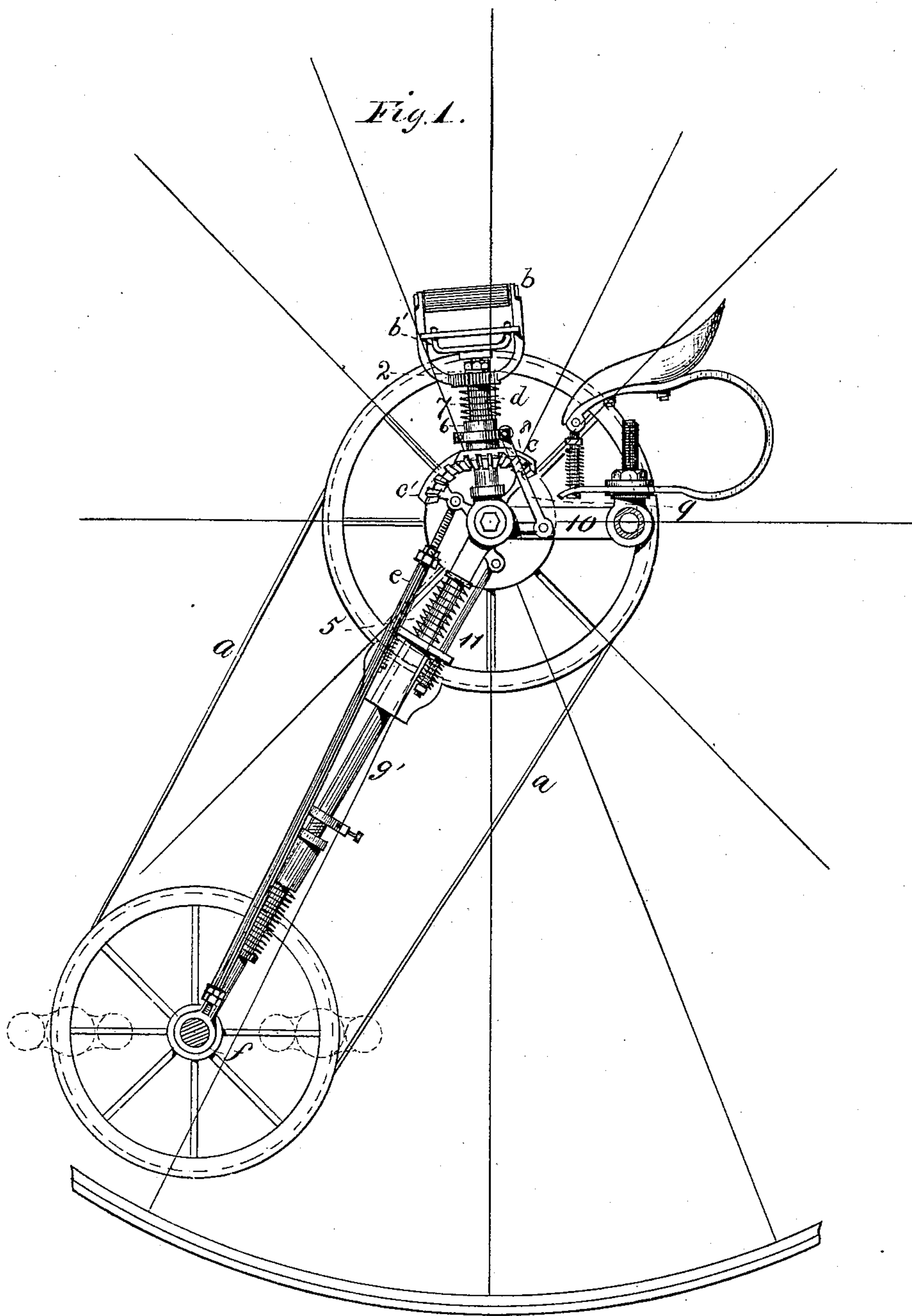
2 Sheets—Sheet 1.

E. C. F. OTTO.

BICYCLE.

No. 250,960.

Patented Dec. 13, 1881.



Attest:
Chas. S. Hyer.
Clerk

Inventor:
Edouard Carl Friedrich Otto.
By His Attorneys
Eiler & Doolittle

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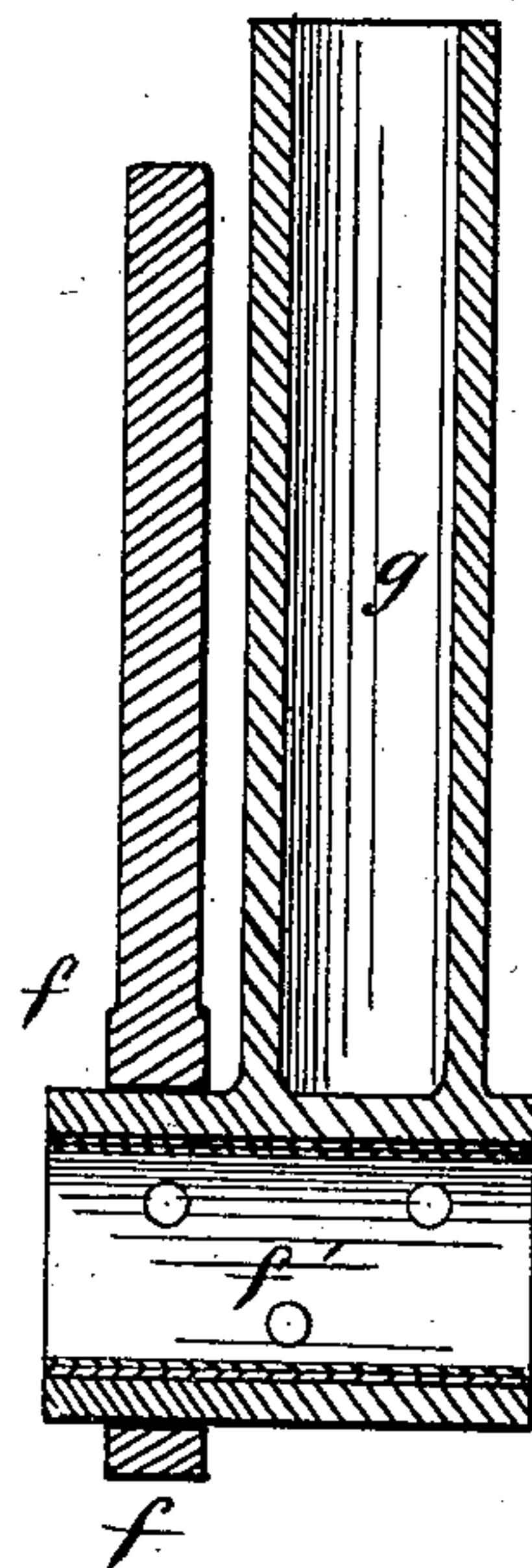
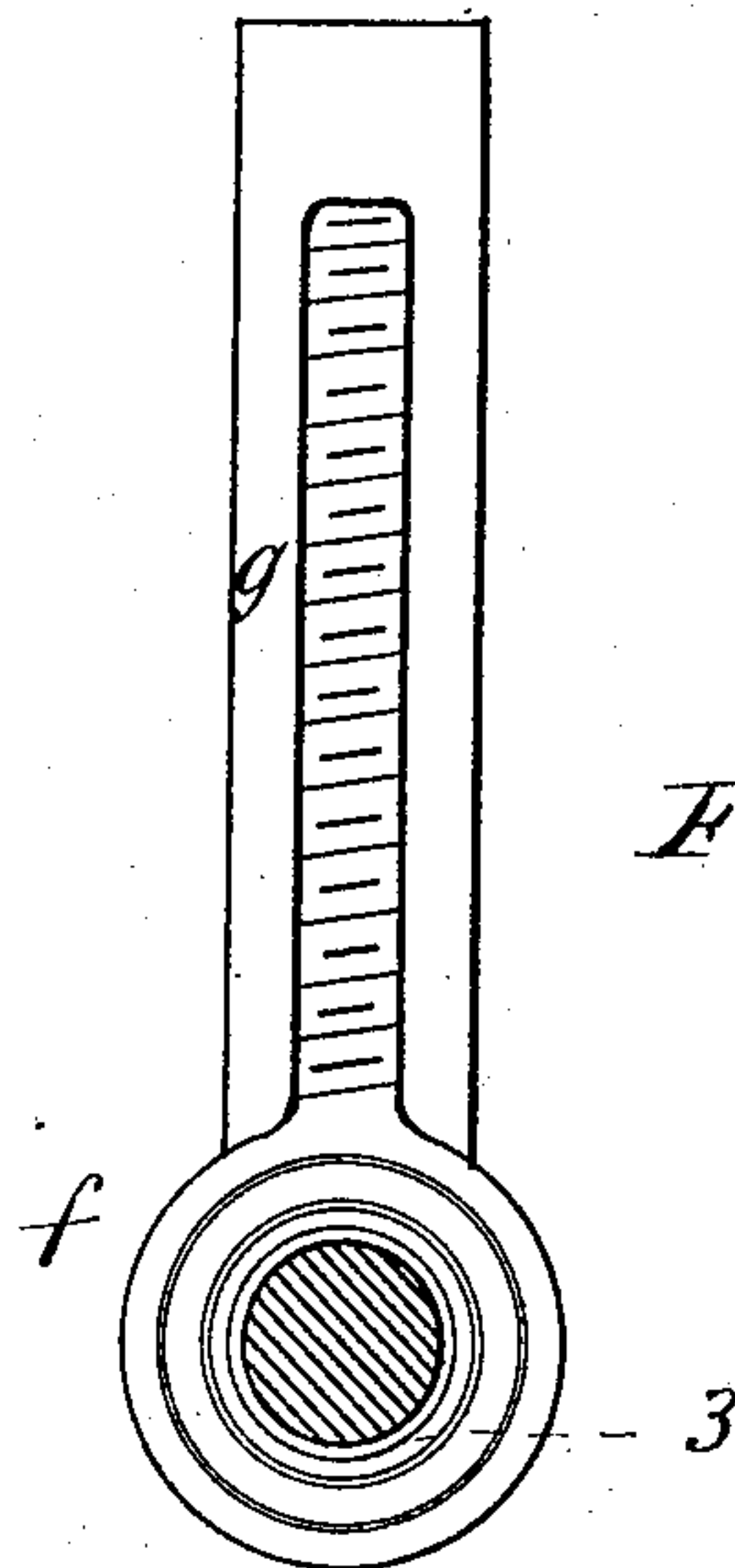
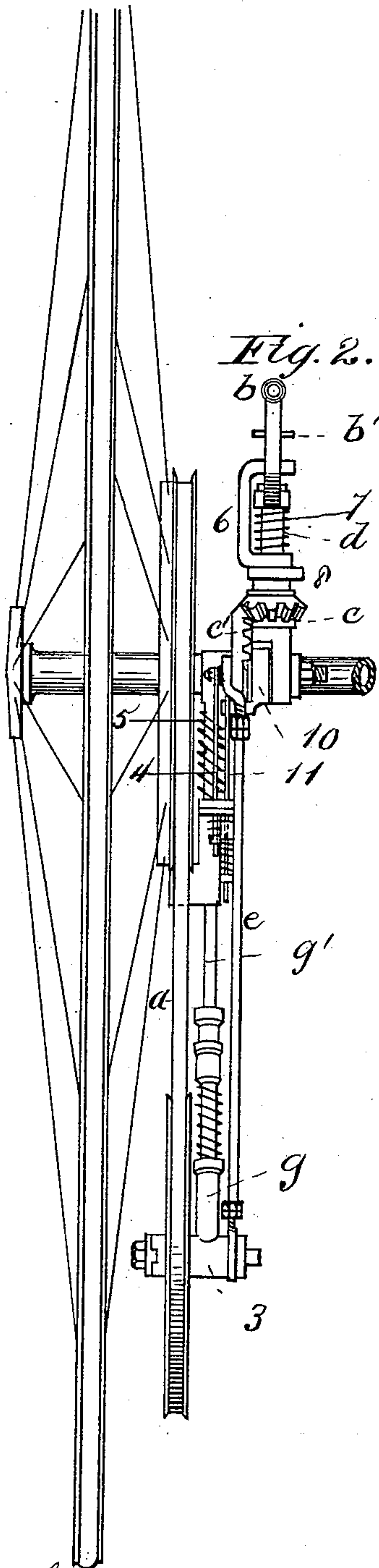
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Attest:
Chas. S. Hyer
Notary Public

Inventor:
Edouard Carl Friedrich Otto
By his Attorney
Eichendorff

UNITED STATES PATENT OFFICE.

EDOUARD C. F. OTTO, OF PECKHAM, COUNTY OF SURREY, ENGLAND.

BICYCLE.

SPECIFICATION forming part of Letters Patent No. 250,960, dated December 13, 1881.

Application filed November 18, 1880. (No model.) Patented in England April 23, 1880.

To all whom it may concern:

Be it known that I, EDOUARD CARL FRIED-
RICH OTTO, a subject of the Queen of Great
Britain, residing at Peckham, in the county of
Surrey, England, have invented certain new
and useful Improvements in the Construction
of Bicycles and other Similar Vehicles, (for
which I have received Letters Patent in Eng-
land, No. 1,673, dated April 23, 1880,) of which
the following is a specification.

My invention relates more particularly to
improvements in the construction of the driv-
ing-bands, steering-gear, and crank slide-bear-
ings of my improved bicycle and tricycle, for
which I have already obtained Letters Patent
in England and the United States of America.
Such improvements are also applicable to
velocipedes in general, and have for their ob-
jects, first, to render the driving-bands far
more durable and effective than hitherto; sec-
ondly, by an improved arrangement of steer-
ing-gear and crank slide-bearings, to materially
assist the rider in maintaining his equilibrium
by affording him a firmer purchase on the steer-
ing-handles of the machine, and thus giving
him perfect control over the vehicle.

In the annexed drawings, Figure 1 is a side
elevation of the right-hand wheel of a bicycle,
showing my improved steering-gear. Fig. 2
is a front elevation thereof. Figs. 3 and 4 are
detail views of the crank slide-bearing.

The same letters of reference are used in all
the figures in the designation of identical parts.

My improvements in driving-bands consist
in employing endless metallic driving-bands *a*,
manufactured from steel or other suitable elas-
tic metal, the advantages of so doing being,
first, that such bands never stretch to any per-
ceptible degree; secondly, that when painted,
electroplated, or otherwise protected they are
rendered impervious to atmospheric influence;
thirdly, that they require but very little slack-
ening for steering purposes. I prefer to cover
the pulleys whereon such driving-bands are
mounted either with india-rubber, vulcanite,
leather, or other suitable material, or any suita-
ble combination of the same, so as to afford a
better gripe or purchase to the driving-bands.

My improvements in the steering-gear are
as follows:

As already observed, my improved metallic

driving-bands require but very little slacken-
ing for steering purposes. This enables me
to place the steering-handles *b* in a fixed verti-
cal position, so that they afford a steady sup-
port to the rider. By simply turning either
one of such handles the driving-band on that
side of the machine is slackened and the brake
applied, thus arresting or retarding the mo-
tion of the corresponding wheel. In addition
to this improved position of the handles, the
improved arrangement of steering-gear con-
sists in fixing a bevel-wheel, *c*, to the tubular
stock *d* of each steering-handle, which stock
swivels on a stud or post firmly attached to the
axle. This stud or post projects slightly above
the upper end of the tubular stock *d*, and is there
provided with a nut, 2, to hold said stock *d* in
proper position. Each bevel-wheel *c* gears in-
to a beveled sector, *c'*, mounted to turn on the
axle of the machine. To each such beveled
sector *c'* a steering-rod, *e*, is attached at its up-
per end, its lower end being connected to the
crank slide-bearing in such manner as to be
adapted to lift the crank-shaft at one end upon
turning the steering-handle in the proper di-
rection. The lifting of the end of the crank-
shaft operates to slacken the belt on that side
of the machine, and by the same movement of
the steering-handle the rider may, if necessary,
apply the brake. The middle section of each
steering-rod *e* is made tubular, and is screw-
threaded interiorly at its ends to receive the
screwed end sections. The upper end section
is provided with an eye, through which a bolt
is passed to connect it with the beveled sector *c'*.
The lower end section, *f*, of the steering-rod
terminates in a ring, in which is seated the
sliding bearing 3 of the crank-shaft. The
screws at the respective ends of the steering-
rod are cut reversely with relation to each
other to admit of the lengthening or shorten-
ing of said steering-rod by turning it in one di-
rection or the other.

The crank slide-bearing 3 contains one or
more perforated tubes, *f'*, Figs. 3 and 4, for
the purpose of lubricating the bearing and pre-
venting friction. The upper part of the crank
slide-bearing is tubular, as shown at *g*, Figs.
3 and 4, and fits loosely on the side rods, *g'*, so
as to allow of its sliding up and down easily
when actuated by the steering-rod.

Suitable brake-rods, 4, are also attached to the beveled sectors *c'*, to which rods the brakes are attached, said brakes being actuated by the before-described movement of the steering-handles to slide up and down the side rods, *g'*, of the bicycle. Upon these side rods, and immediately above the brakes, suitable spiral springs, 5, are placed, which serve to keep said brakes normally free from contact with the pulleys. The steering-handles *b* are secured at the top of their tubular stocks, and are made of curvilinear form, (preferably in the form of a horseshoe, as shown,) and within each of the recesses formed thereby I place a secondary handle, *b'*, which carries the upper end of a link, 6, the lower end of which encircles and is adapted to slide on the lower part of the handle-stock. Spiral springs 7, encircling the handle-stocks, serve to keep the links and supplementary handles *b'* normally in their lowermost positions.

Connected to the lower end of each link 6 is a collar, 8, which is connected by means of a rod, 9, to a lever, 10, mounted to turn on the axle to which the steering-gear is fitted, while the brake-blocks are connected to such levers by wires 11, and are actuated and controlled

by simply raising the secondary handles *b'*, which are so placed as to be immediately beneath the fingers of the rider, and may thus be operated with the utmost facility.

By this improved arrangement of steering-gear the rider obtains a better purchase and control over the vehicle, as he is enabled to grasp the steering-handles firmly, owing to their rigid vertical position, at the same time that by means of the secondary handles *b'* he possesses immediate and entire control over the brakes without releasing his hold on the steering-handles.

Having thus described my invention, what I claim is—

1. The construction and arrangement of the steering-gear, consisting of steering-handles *b*, secondary handles *b'*, bevel-gears *c*, beveled sectors *c'*, steering-rods *e*, screws *f*, links 6, spiral springs 7, collars 8, rods 9, and levers 10.

2. The construction and arrangement of the crank slide-bearings, comprising said bearings 3, perforated tubes *f'*, and hollow sockets *g*.

EDOUARD CARL FRIEDRICH OTTO.

Witnesses:

SHIRLEY BOWDEN,
W. R. LOWMAN.