

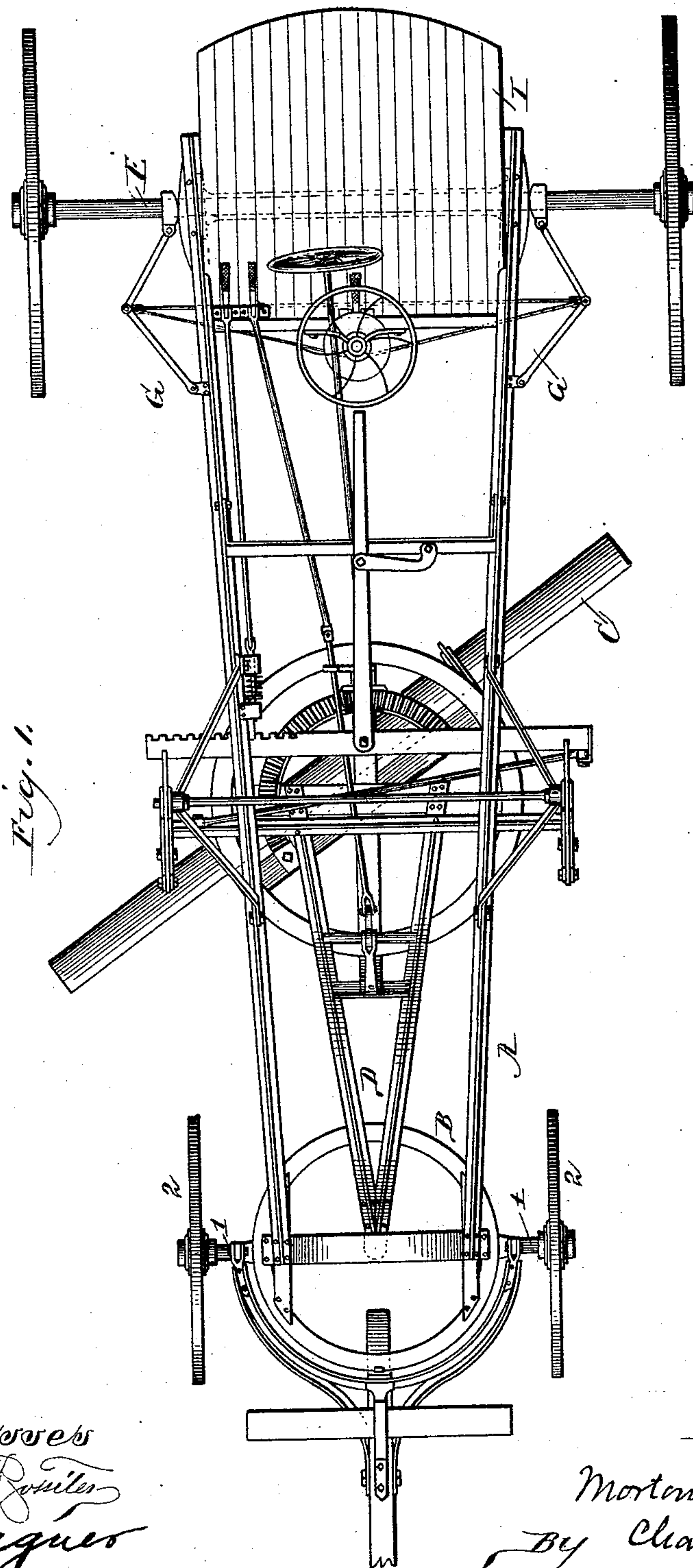
(No Model.)

2 Sheets—Sheet 1.

M. G. BUNNELL.
MACHINE FOR MAKING AND REPAIRING ROADS.

No. 455,705.

Patented July 7, 1891.



Witnesses
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R. Inague

Inventor
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By Chas. G. Page
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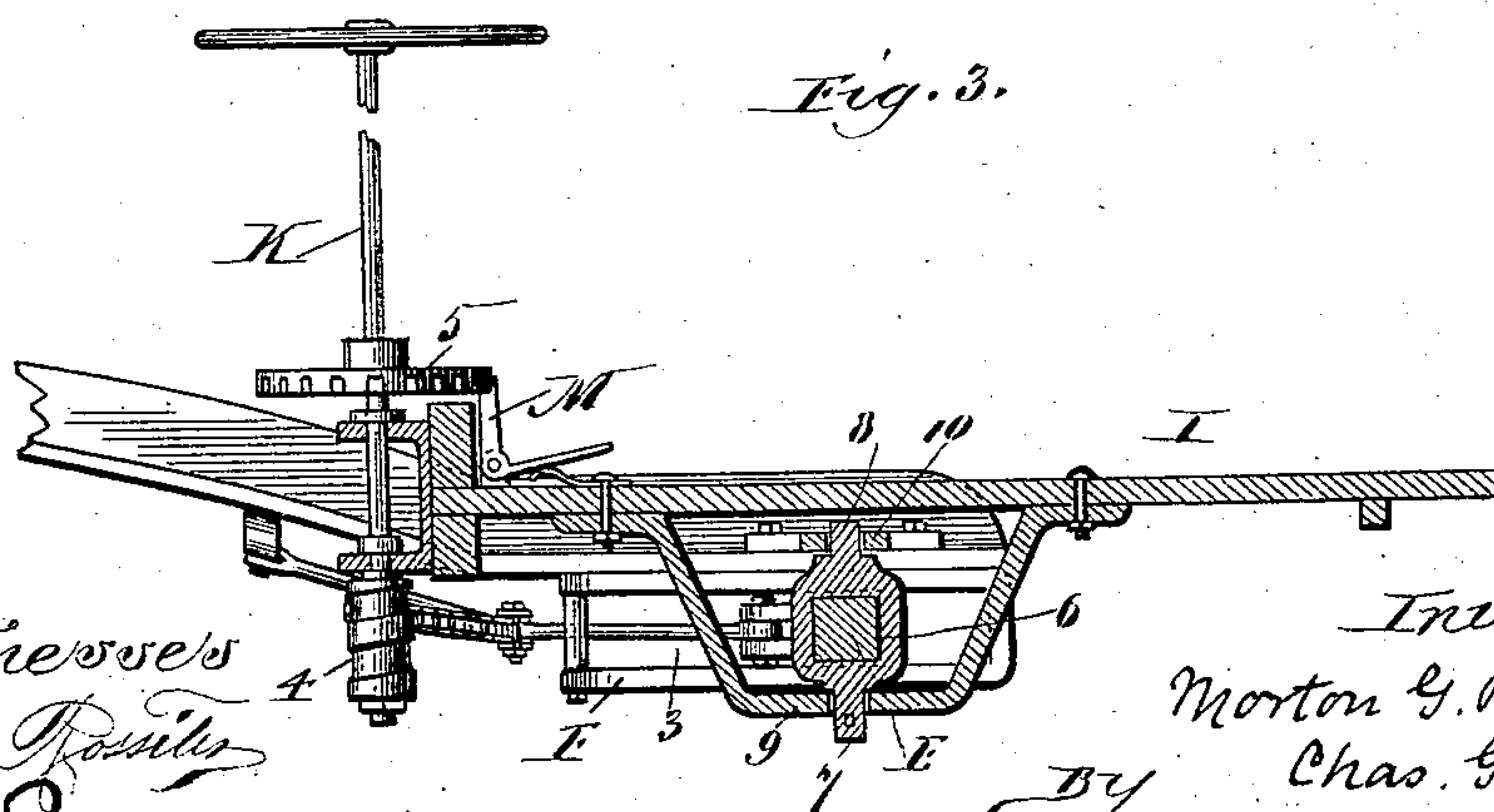
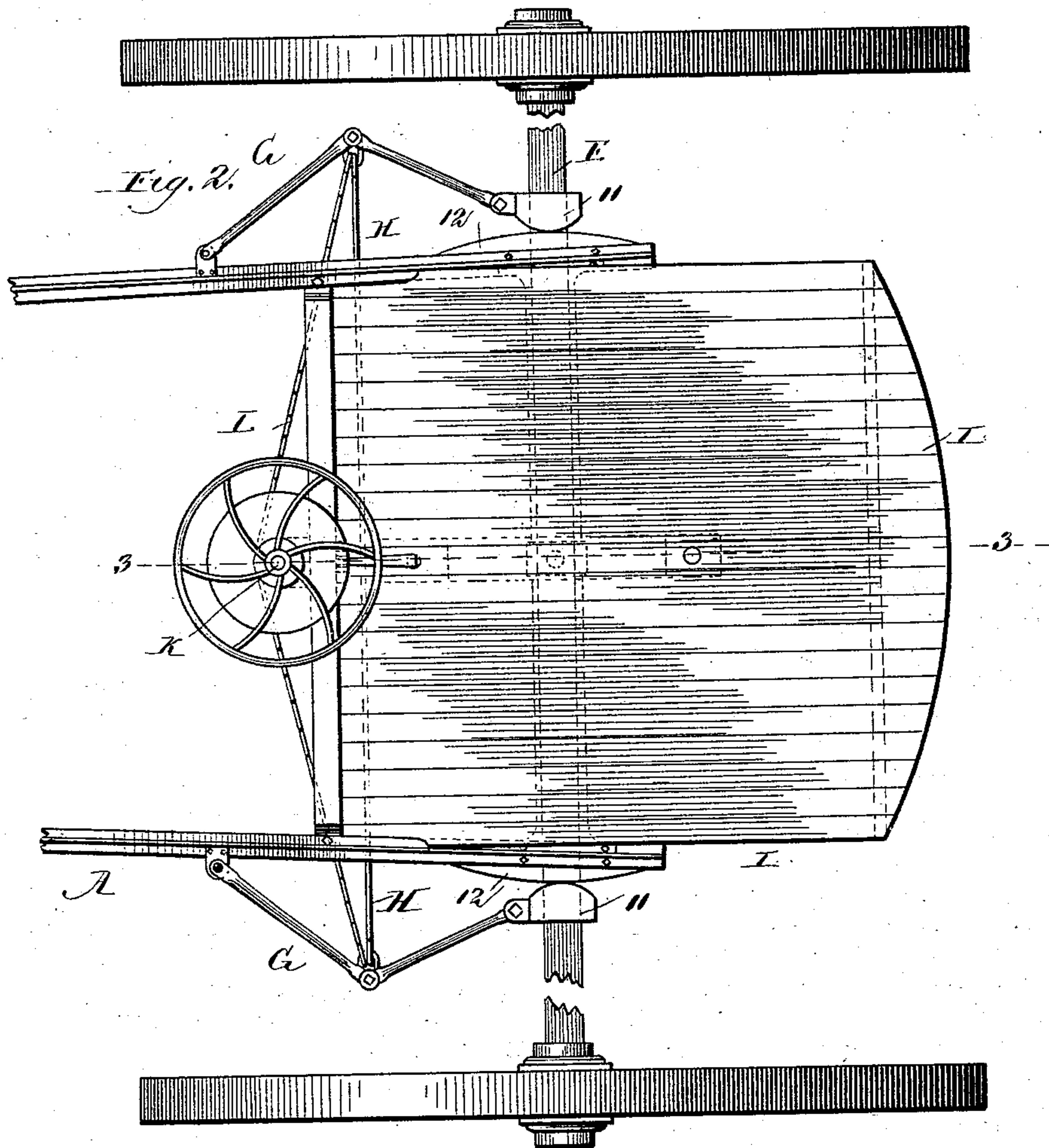
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2 Sheets—Sheet 2.

M. G. BUNNELL.
MACHINE FOR MAKING AND REPAIRING ROADS.

No. 455,705.

Patented July 7, 1891.



Witnesses
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Inventor
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UNITED STATES PATENT OFFICE.

MORTON G. BUNNELL, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO ANNA B. AUSTIN, OF SAME PLACE.

MACHINE FOR MAKING AND REPAIRING ROADS.

SPECIFICATION forming part of Letters Patent No. 455,705, dated July 7, 1891.

Application filed October 27, 1890. Serial No. 369,465. (No model.)

To all whom it may concern:

Be it known that I, MORTON G. BUNNELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Machines for Making and Repairing Roads, of which the following is a specification.

My invention relates to a construction of road-making and road-repairing machine involving a body-frame supported upon horizontally-swinging front and rear axles and a diagonally-adjustable scraper-blade arranged so that it can be adjusted to various horizontal angles relatively to the line of progression of the machine.

The object of my invention is to provide novel and improved means for swinging the rear axle horizontally, so as to effect certain changes in the position of the rear wheels relatively to the front wheels and to the position and horizontal angular adjustment of the diagonally-adjustable scraper-blade, to effect a change in position of the scraper-blade, and to overcome such side draft as may result from the oblique position of said blade.

To the attainment of the foregoing and other useful ends my invention consists in matters hereinafter set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a road-working machine embodying my invention. Fig. 2 is a top plan view of the rear portion of the machine on a somewhat larger scale than the preceding figure, portions of the rear axle being broken away for convenience of illustration. Fig. 3 is a section on line 3 3 in Fig. 2, the hand-wheel shaft being, however, shown in elevation and broken away for a portion of its length for convenience of illustration.

In said drawings, A indicates the body-frame, which is pivotally supported at its forward end upon the short swinging front axle 1, which said axle is provided with wheels 2 in the ordinary way. While the forward end of the body-frame may be pivotally supported upon the front axle in various ways, I prefer to employ a turn-table or large fifth-wheel B as a pivotal connection between said body-

frame and front axle. A diagonally-adjustable scraper-blade C is arranged below the body-frame and is suspended therefrom by suitable raising and lowering devices, which, however, permit the blade to be swung bodily toward one and the other side of the machine. The blade is drawn by the horizontally and vertically swinging draft-bar D, with which the blade is pivotally connected, so that the ends of the blade may be alternately placed ahead and also so that the blade, which is arranged to extend across the space between the front and rear wheels, can be swung horizontally about its pivotal center in order to vary its horizontal angle relatively to the line of progression. While I may employ various means for raising and lowering the blade and for adjusting it about its pivotal connection with the swinging draft-bar, I have in Fig. 1 indicated as a means for attaining said ends and for swinging the draft-bar certain devices, more fully illustrated in my application, Serial No. 370,236, filed November 3, 1890.

The long rear axle E, which supports the rear end of the body-frame, is arranged to swing horizontally about a point midway of its ends and is adjustable in its said movement independently of the body-frame. The end portions of the rear axle extend beyond the sides of the body-frame, so as to set the wheels out from the same to an extent to permit the desired extent of swinging adjustment on the part of the axle. The end portions of the rear axle also extend through guide-bearings F, which are secured to the axle and provided with horizontal guideways 3, proportional in length to the greatest desired extent of swing on the part of the end portions of the axle which pass through said guideways. These guideways steady the axle and prevent the body-frame from tipping sidewise independently of the axle. The end portions of the horizontally-swinging rear axle are connected with the body-frame by toggles G, which are normally bent, as in Figs. 1 and 2, when the rear axle is at right angles to the length of the body-frame. By this arrangement one of the toggles will tend to straighten out, while the other will tend to

further close or contract when the axle is swung about a point midway of its ends. As a preferred arrangement, I connect the toggles by a rod or bar *h*, so that the toggles shall operate synchronously or simultaneously, and in this way a pull or push upon the middle joint of either toggle in a direction transverse to the length of the body-frame will cause both toggles to operate simultaneously.

During the aforesaid operation of the toggles the one which has a closing action will serve to draw one end of the axle forward, and simultaneously therewith the toggle which is straightening out will serve to force the remaining end of the axle rearwardly. It will be obvious that I could provide independent devices for operating the toggles and place such devices under the control of an attendant standing upon the rear platform of the machine, or that I could provide in connection with the toggles a device arranged to apply power direct to the axle as a means for swinging it; but as a simpler and preferred way I employ a single device for operating both toggles. The device herein provided for thus operating the toggles comprises a hand-wheel shaft *K*, arranged within convenient reach of an attendant standing upon the rear platform and connected with the toggles by a chain or like flexible connection—such as a cord or cable—in such way that by turning the hand-wheel shaft a pull can be exerted upon one or the other of the toggles, according to the direction in which the hand-wheel shaft is turned.

The hand-wheel shaft is mounted upon the body-frame and may be provided with a sprocket arranged to engage a chain having its ends respectively connected with one and the other of the toggles at their middle joints; but as a preferred arrangement I provide the hand-wheel shaft with a spirally-grooved winding-drum or enlarged shaft portion 4 and divide the chain *L* into two sections or lengths having their outer ends attached to the toggles and their inner ends attached to the winding-shaft.

As a means for locking the winding-shaft I provide it with a notched wheel 5 and arrange upon the rear platform a foot-latch *M*, which can engage the notched wheel on the winding-shaft.

As a preferred arrangement the rear axle is at a point midway of its ends pivotally connected with the body-frame, and as a means for thus connecting it with the body-frame I provide a collar 6, which is fixed upon the axle and provided with pivots or journals 7 and 8, having their bearings respectively in a bent bar 9 and a straight bar 10. This construction of pivot is included in the subject-matter of my pending application, Serial No. 363,273, filed August 28, 1890. I may, however, omit pivoting the axle to the body-frame and provide the axle with shoulders or abutments 11, arranged to bear against curved guides 12,

which are fixed upon the body-frame and formed with their curved portions in the arc of a circle having for its center a point midway of the ends of the axle, which devices are more particularly described in my pending application, Serial No. 369,464, filed October 27, 1890. Where I thus provide the curved guides 12, I find it convenient to form the same by curving one or both of the outer longitudinal edges of the guide-bearings *F*.

By operating the hand-wheel the rear axle can be adjusted so as to set it oblique to the length of the body-frame. When the axle is thus set oblique to the body-frame, the rear wheels will run to one side and the body-frame will swing upon the front axle until it is in such position oblique to the line of progression as shall restore parallelism between the two axles. In this way either rear wheel of the long rear axle can be brought into alignment with one of the front wheels, or the rear wheels can be made to travel in other selected lines.

The adjustment of the body-frame serves to change the bodily position of the scraper-blade, which can also be adjusted diagonally with reference to the position of the body-frame, the rear wheels, and the work to be performed. The rear wheels can also be made to travel in selected lines with particular reference to the diagonal adjustment of the scraper-blade and also with reference to the side draft, it being observed that when the body-frame is oblique to the line of progression the side draft will be resisted by the disposition on the part of the rear wheels to run straight ahead.

What I claim as my invention is—

1. The combination, substantially as hereinbefore set forth, in a machine for making and repairing roads, of a body-frame pivotally supported upon the front axle, a diagonally-adjustable scraper-blade carried below the body-frame and arranged to extend across the space between the front and rear wheels, a horizontally-swinging rear axle adjustable in said movement independently of the body-frame, and toggles arranged to connect the end portions of the rear axle with the body-frame, so that by adjusting the toggles one end of the rear axle can be swung forward, while its opposite end can be swung rearward, for the purpose described.

2. The combination, substantially as hereinbefore set forth, in a machine for making and repairing roads, of a body-frame pivotally supported upon the front axle, a diagonally-adjustable scraper-blade carried below the body-frame and arranged to extend across the space between the front and rear wheels, a horizontally-swinging rear axle adjustable in said movement independently of the body-frame, and a couple of connected and simultaneously-operating toggles connecting the end portions of the rear axle with the body-frame, for the purpose described.

3. The combination, substantially as here-

inbefore set forth, in a machine for making
and repairing roads, of a body-frame pivot-
ally supported upon the front axle, a diago-
nally-adjustable scraper-blade carried below
5 the body-frame and arranged to extend across
the space between the front and rear wheels,
a horizontally-swinging rear axle adjustable
in said movement independently of the body-
frame, a couple of connected simultaneously-
10 operating toggles connecting the end portions
of the rear axle with the body-frame, and
means suitable for operating the toggles, for
the purpose described.

4. The combination, substantially as here-
15 inbefore set forth, in a machine for making
and repairing roads, of a body-frame pivot-
ally supported upon the front axle, a diago-

nally-adjustable scraper-blade carried below
the body-frame and arranged to extend across
the space between the front and rear wheels, 20
a horizontally-swinging rear axle adjustable
in said movement independently of the body-
frame, a pair of connected and simultaneous-
ly-operating toggles connecting the end por-
tions of the rear axle with the body-frame, a 25
hand-wheel shaft supported upon the body-
frame, and a chain or like connection oper-
ated from said hand-wheel shaft and forming
a connection between the same and the tog-
gles.

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Witnesses:

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