

W. S. HOVEY & C. B. STEBBINS.
RAILWAY MOTOR CAR.
APPLICATION FILED JAN. 30, 1911.

992,356.

Patented May 16, 1911.

3 SHEETS—SHEET 1.

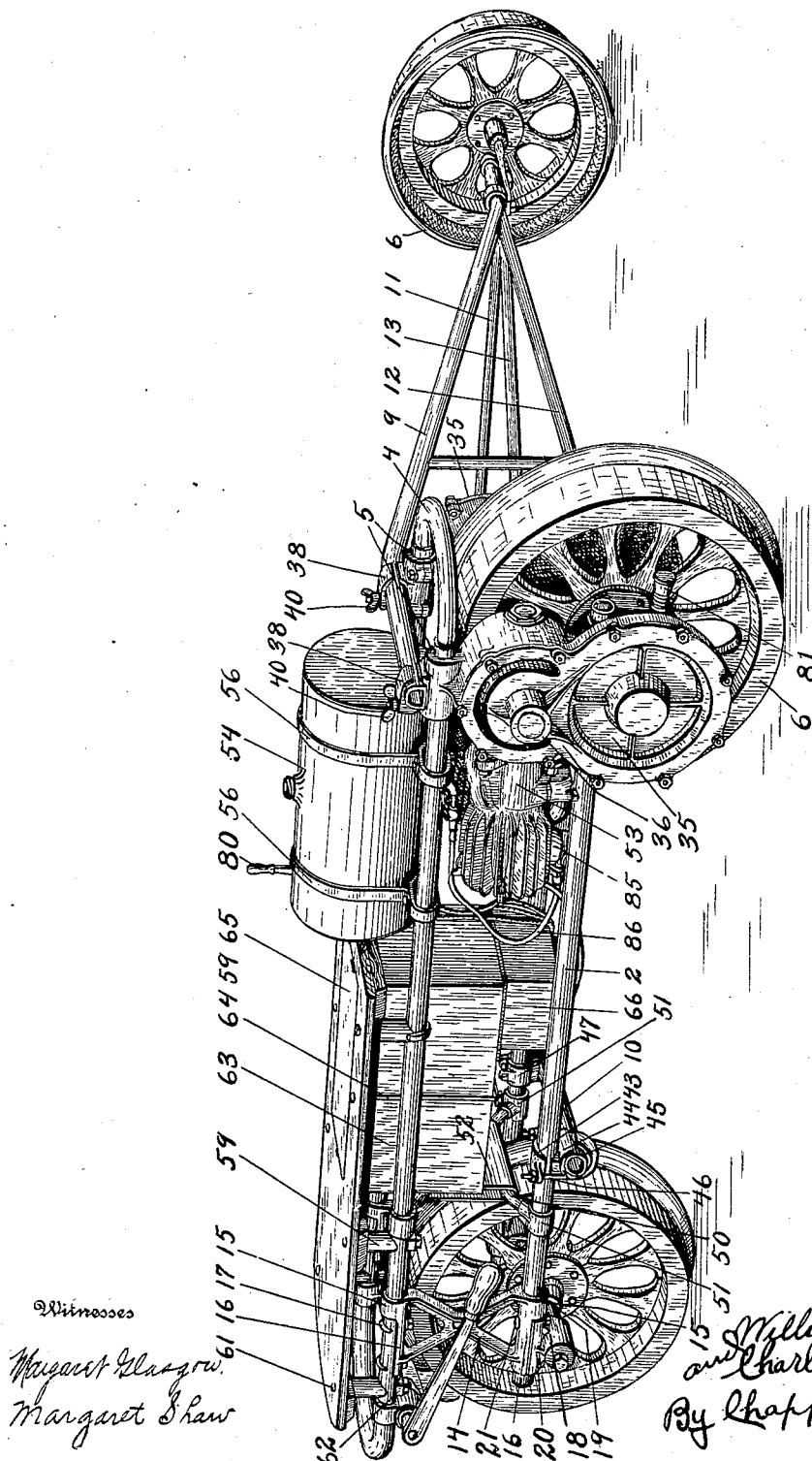


Fig. 1.

Inventor

William S. Hovey
and Charles B. Stebbins
By Rappell & Carl
Attorneys

Witnesses

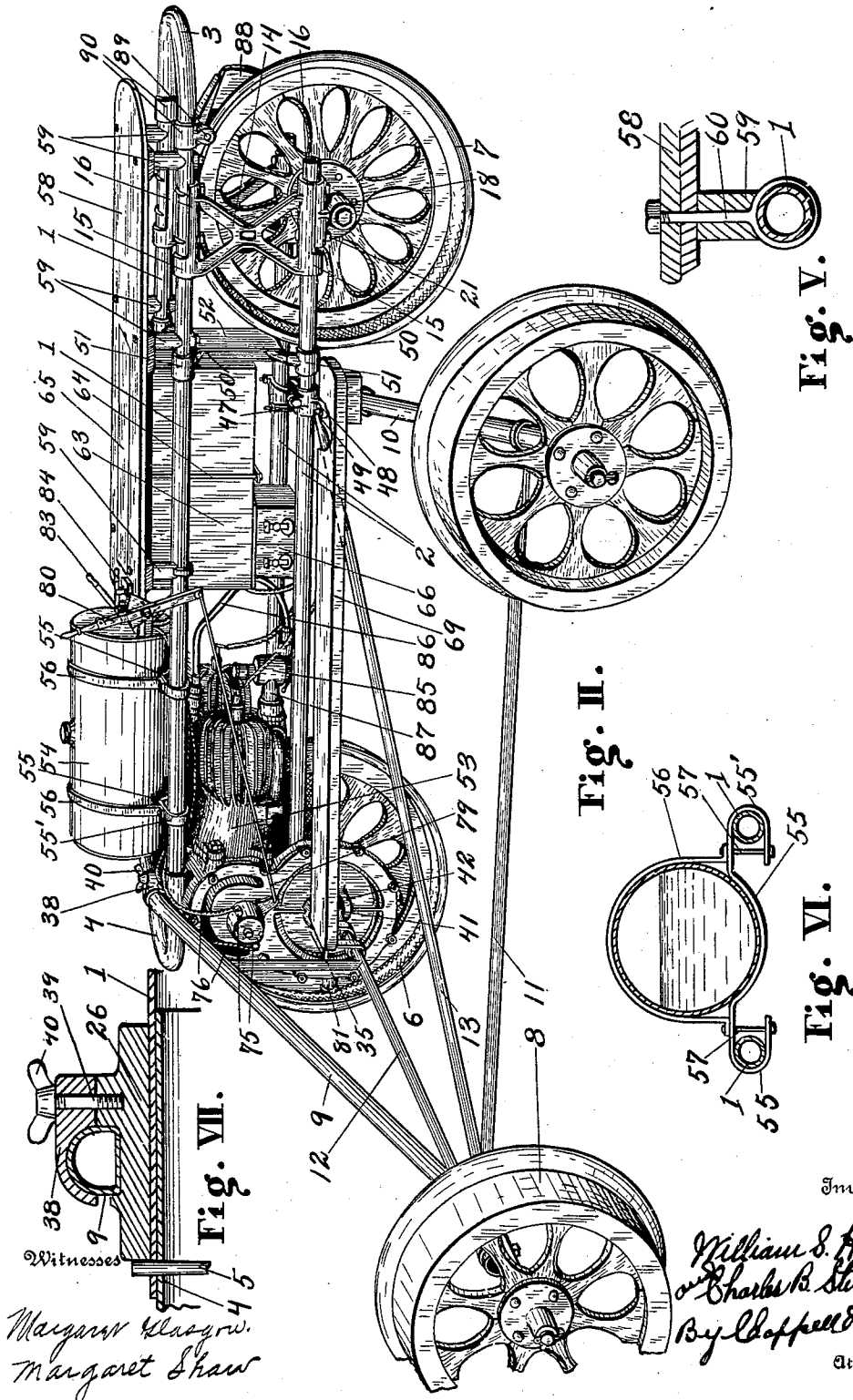
Margaret Glasgow.
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3 SHEETS-SHEET 2.



Witnesses
Margaret Glasgow.
Margaret Shaw

Inventor
William S. Hovey
and Charles B. Stebbins
By Clifford & Carl
Attorneys

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3 SHEETS—SHEET 3.

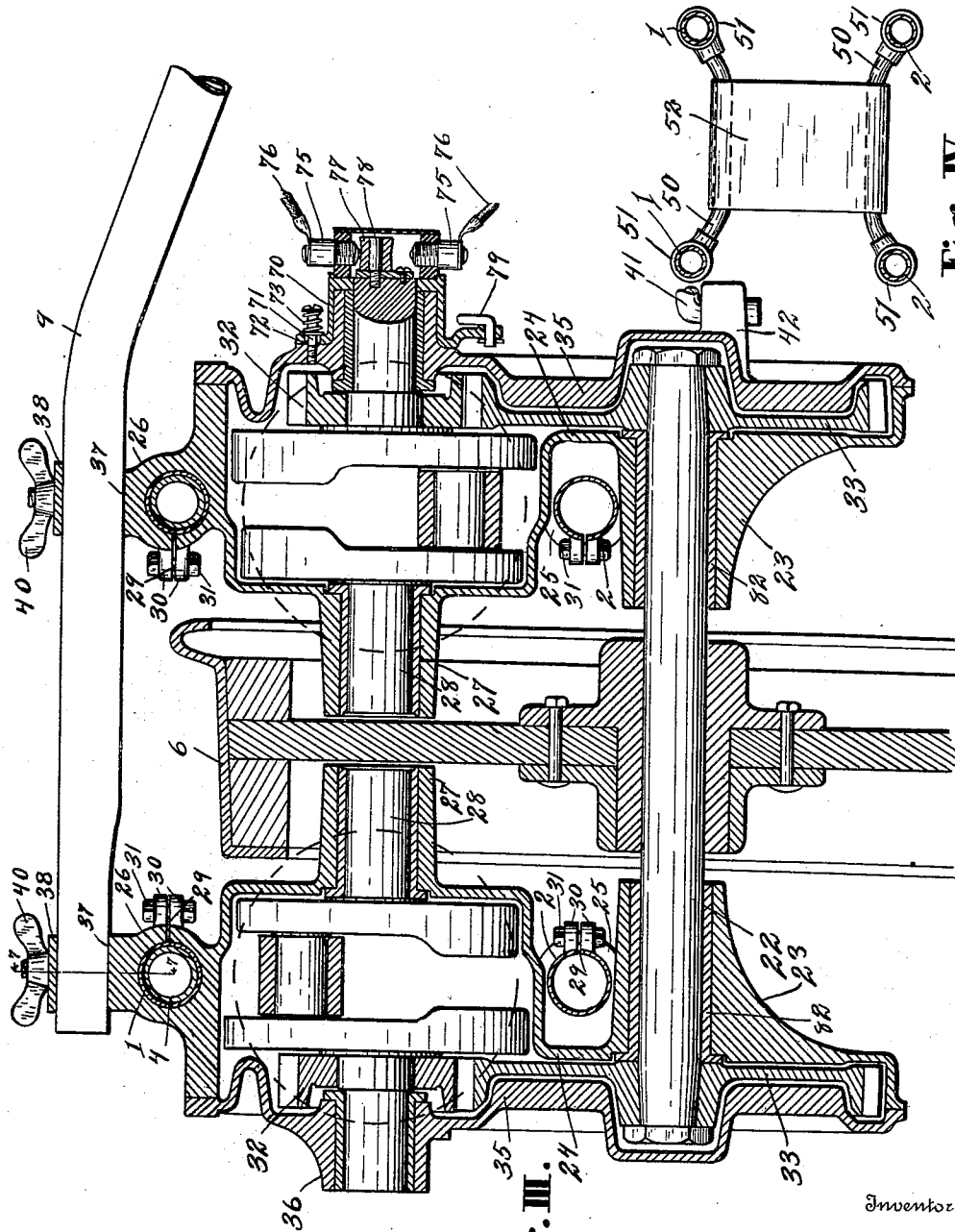


Fig. IV.

Fig. III.

Witnesses
Margaret Glasgow.
Margaret Shaw.

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William S. Hovey
and Charles B. Stebbins
Shappell & Earl
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM S. HOVEY AND CHARLES B. STEBBINS, OF THREE RIVERS, MICHIGAN, ASSIGNORS TO SHEFFIELD CAR COMPANY, OF THREE RIVERS, MICHIGAN.

RAILWAY MOTOR-CAR.

992,356.

Specification of Letters Patent.

Patented May 16, 1911.

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To all whom it may concern:

Be it known that we, WILLIAM S. HOVEY and CHARLES B. STEBBINS, citizens of the United States, residing at the city of Three Rivers, county of St. Joseph, State of Michigan, have invented certain new and useful Improvements in Railway Motor-Cars, of which the following is a specification.

This invention relates to improvements in railway motor cars.

The main objects of this invention are: First, to provide in a motor car an improved frame structure. Second, to provide in a motor car an improved frame structure in which the engine crank casings constitute frame elements. Third, to provide in a motor car an improved arrangement of the engines and driving connection for the engines to the traction wheels. Fourth, to provide in a motor car an improved engine mounting. Fifth, to provide an improved railway motor car which is very compact and simple in structure.

Further objects, and objects relating to structural details, will definitely appear from the detailed description to follow.

We accomplish the objects of our invention by the devices and means described in the following specification.

The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of our invention, is clearly illustrated in the accompanying drawing, forming a part of this specification, in which:

Figure I is a perspective view of a structure embodying the features of our invention. Fig. II is a perspective view of the opposite side from that shown in Fig. I. Fig. III is an enlarged detail vertical section through the traction wheel and the engine crank shaft and gear casings. Fig. IV is a vertical section through the frame showing the arrangements of the frame truss. Fig. V is an enlarged detail vertical section showing details of the seat or platform support. Fig. VI is a vertical section showing details of the mounting for the reservoir 54. Fig. VII is an enlarged detail section through one of the clamps for the wheel bar 9 taken on a line corresponding to line 7—7 of Fig. III.

In the drawings, similar reference numerals refer to similar parts throughout the several views.

Referring to the drawing, the frame of our improved motor car consists of the top sills 1 and bottom sills 2. These sills are formed of tubing. As illustrated, the top sills are formed integrally of a U-shaped sill member, the rear or looped end 3 of the member forming a cross piece connection for the rear ends of the sills and being also adapted to serve as a handle for the car. A U-shaped front cross piece member 4 is provided for the front ends of the top sills, the member 4 being telescoped into the ends of the sills 1 and secured therein as by means of the pins 5.

The car illustrated is provided with main wheels 6 and 7 and auxiliary wheels 8. The main wheels 6 and 7 are arranged in the frame,—that is, between the bottom sills thereof, while the auxiliary wheels are carried by the bars 9 and 10. The outer ends of these bars are connected by the rod 11. The bars 9 and 10 are braced by the braces 12 and 13, the brace 12 being arranged under the bar 9, while the brace 13 extends from the outer end of the bar 9 to the inner end of the bar 10.

The top and bottom sills are connected at their rear ends by the vertical cross pieces 14. These cross pieces are preferably X-shaped and are provided with collars 15 at their ends adapted to receive the sills and with seats 16 for the sills. The top sills are secured in these seats by means of the T-clamping bolts 17.

The bearings 18 for the axle 19 of the rear wheel 7 are provided with seats 20 for the bottom sills, and are secured by means of the bolts 21 arranged through the bottom sill seats of the vertical cross pieces 14, and the sill seats on the bearings. The axle for the front wheel 6 is arranged on bearings 23 provided therefor on the casings 24. These casings are provided with clamps 25 for the bottom sills 2 and clamps 26 for the top sills 1, the clamps being formed integrally therewith, as is also the bearing 23 for the axle and the bearing 27 for the crank shaft 28 of the engine. The clamps 25 are arranged between the bearings 23 and

the crank casing portions of the casings, while the clamps 26 are arranged upon the upper ends of the casings.

The clamps 25 and 26 are in the form of
5 holes adapted to receive the sills, having
slits 29 on their inner sides, and ears 30
through which the clamping bolts 31 are ar-
ranged. The casings 24 are thus adapted to
form frame members, as well as to incase
10 the crank shafts and support the bearings
for the crank shafts and axle. The driving
connections for the crank shaft to the axle
are also inclosed by this casing, and in the
structure illustrated, consist of the pinions
15 32 on the crank shafts and the gears 33 on
the axle with which the pinions are ar-
ranged to mesh.

The side members 35 of the casing are pro-
vided with bearings 36 for the outer ends of
20 the crank shafts. The casings 24 are pro-
vided with seats 37 for the wheel bar 9.
These seats are arranged upon the sill clamp
26. The wheel bars are secured in these
seats by the clamps 38. The securing bolts
25 39 are provided with thumb nuts 40 so that
the clamps can be readily released to permit
the removal of the auxiliary wheel bar when
the structure is knocked down for shipment
or storage.

The brace bar 12 is provided with a hook
30 41 at its inner end adapted to engage the ear
42 on the side member 35 of the inner casing.
The auxiliary wheel bar 10 is secured to the
bottom sills by means of clamps so that it
35 can be readily removed. The clamp for the
outer sill consists of the top member 43,
which engages the top of the sill 2, the inter-
mediate member 44, which is interposed be-
tween the bar 12 and the sill, and the bottom
40 member 45 which is embraced by the U-bolt
46, the bolt being arranged through the top
member 43. See Fig. I.

The bar 10 is secured to the inner sill 2 by
means of a double clamp 47,—that is, it has
45 a clamp member adapted to embrace the sill
and one adapted to embrace the bar. This
clamp is provided with an ear 48 adapted
to receive the hook 49 on the brace bar 13,
see Fig. II. With the wheel bars 9 and 10
50 thus secured, they serve as frame bracing
members or cross pieces. We also provide the
frame with a truss, which, in the structure
illustrated, consists of the truss cross pieces
50, having collars 51 at their ends adapted
55 to receive the sill members. These cross
members are bent toward each other and con-
nected by the strap 52, see Fig. IV. The
frame pieces are preferably formed of tub-
ing, as illustrated, on account of strength
60 and lightness. The engine cylinders 53 are
upon the casings 24, the engines preferably
used being of the two-cycle type.

The fuel reservoir 54 is mounted upon the
top sills to the rear of the front bar 9. The
65 reservoir is cylindrical in form and is ar-

ranged in a horizontal position, it being sup-
ported by the straps 55, which are looped
around the sills at 55'. The reservoir is se-
cured upon the supports 55 by means of the
straps 56, which are arranged over the reser-
voir and secured by means of the bolt 57,
which also secures the straps 55. 70

A platform-like seat 58 is arranged at the
rear of the reservoir and is supported upon
the top sills by means of the spools 59 75
through which the clamping bolts 60 are
arranged. A part of these clamping bolts
are eye bolts, as 60, shown in Fig. V. Others,
as 61, are common bolts provided with clamp
members 62 for the under sides of the sills. 80
Under the seat and in front of the truss
member described, we support a box 63 by
means of the rods 64. This box is provided
with a lid 65, forming a part of the platform
58. The spart coil 66 is supported under 85
the box 63. The foot board 69 is mounted
upon the front bar brace 12 and the rear
auxiliary wheel bar 10, as shown in Fig. II.

The timer preferably consists of a sleeve-
like adjustable member 70 mounted upon the
bearing for the crank shaft and the inner
side member 35 of the casings 24, see Fig. III.
This member 70 is retained upon the bearing
by means of the pin 71 which is arranged
through a slot 72 in the member, a spring 73 95
being arranged on the pin, as illustrated. A
pair of contact members 75 are mounted on
this member 70 and suitably connected by
the wires 76. A coacting contact member 77
100 is mounted on the end of the crank shaft, the
contact member being a roller mounted on a
pin 78, which is arranged at one side of the
center of the crank shaft, as shown. The
member 70 is connected by the link 79 to the
lever 80. We thus provide a simple and 105
effective timer without the addition of a
special timer shaft and driving connections
therefor. We preferably provide grease
cups 81 for the axle bearings 23, the bearings
being provided with suitable bushings 82. 110

The lever 80 is arranged at the forward
end of the seat 58, as is also the throttle
lever 83 and the switch 84, see Fig. II. The
carbureter 85 is arranged between and
slightly to the rear of the engine cylinder, 115
see Fig. II, and connected to the reservoir by
means of the pipe 86 and to the cylinders by
means of the binding pipe 87. The brake
shoe 88 is carried by the rock shaft 89,
which is mounted on the sleeve-like support 120
90 on the top sill, see Figs. I and II.

With the parts thus formed and arranged,
they may be readily and easily formed and
assembled. The frame pieces are secured
together by clamps, so that the connections 125
are very rigid and secure and are not likely
to loosen in use. This is a very desirable
feature, as in use, the cars are ordinarily
exposed to all kinds of weather and severe
and careless use, and in operating them, are 130

subject to severe vibration owing to their comparatively light weight and it is desirable that the engine shall be mounted directly upon the frame.

5 By connecting the engine directly to the casing and the casing to the traction wheel axle, the frame is largely relieved from the strain of the weight of the engine, and of its operation.

10 We have illustrated and described our improvements in detail in the form preferred by us and in the form in which we have embodied the same in practice. We are aware, however, that considerable variations in structural details are possible, but as such variations will no doubt suggest themselves to those skilled in the art to which this invention relates, we have not attempted to illustrate or describe the same herein, but we desire to be understood as claiming our invention specifically in the form illustrated, as well as broadly within the scope of the appended claims.

25 Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. The combination with the axles, and front and rear auxiliary wheel bars, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to the front axle; casings for said crank shafts and gears having crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith, the top sill clamps being disposed on the upper ends of said casings and the bar seats being disposed on such clamps, the bottom sill clamps being disposed between the axle bearings and the crank shaft portions of said casings; side members for said casing provided with bearings for the outer ends of said crank shafts; engine cylinders secured to said casings; clamps for securing said front wheel bar in its said seats; clamps for the rear wheel bar carried by the bottom sills; and wheel bar braces having hooks at their inner ends, the side member of the inner casing and the inner sill clamp for the rear bar being provided with ears with which said hooks are engaged.

2. The combination with the axles, and front and rear auxiliary wheel bars, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to the front axle; casings for said crank shafts and gears having crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith; side members for said casing provided with bearings for the outer ends of said crank shaft; engine cylinders secured to said casings; clamps for securing said front wheel bar in its said seats; clamps for the rear wheel bar

carried by the bottom sills; and wheel bar braces having hooks at their inner ends, the side member of the inner casing and the inner sill clamp for the rear bar being provided with ears with which said hooks are engaged.

3. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to said axle; casings for said crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith, the top sill clamps being disposed on the upper ends of said casings and the bar seats being disposed on such clamps, the bottom sill clamps being disposed between the axle bearings and the crank shaft portions of said casings; side members for said casing provided with bearings for the outer ends of said crank shafts; engine cylinders secured to said casings; clamps for securing said wheel bar in its said seats; and a wheel brace having a hook at its inner end, the side member of the inner casing being provided with an ear with which said hook is engaged.

4. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to said axle; casings for said crank shaft and gears having crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith; side members for said casing provided with bearings for the outer ends of said crank shafts; engine cylinders secured to said casings; clamps for securing said wheel bar in its said seats; and a wheel brace having a hook at its inner end, the side member of the inner casing being provided with an ear with which said hook is engaged.

5. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; driving connections for said crank shafts to said axle; casings for said crank shafts and driving connections having crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith, the top sill clamps being disposed on the upper ends of said casings and the bar seats being disposed on such clamps, the bottom sill clamps being disposed between the axle bearings and the crank shaft portions of said casings; engine cylinders mounted on said casings; clamps for securing said wheel bar in its said seats; and a wheel brace secured at its inner end to the inner casing.

6. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; driving connections for said crank shafts to

- said axle; casings for said crank shaft and driving connections having crank shaft and axle bearings and clamps for the top and bottom sills and front wheel bar seats formed integrally therewith; engine cylinders mounted on said casings; clamps for securing said wheel bar in its said seats; and a wheel brace secured at its inner end to the inner casing.
7. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; driving connections for said crank shafts to said axle; casings for said crank shaft and driving connections having crank shaft bearings thereon, said sills being secured to said casings; side members for said casings having bearings for said crank shafts thereon; engine cylinders mounted on said casings; and a wheel brace secured at its inner end to the inner casing.
8. The combination with an axle and an auxiliary wheel bar, of a frame comprising top and bottom sills; engine crank shafts; driving connections for said crank shafts to said axle; casings for said crank shaft and driving connections having crank shaft and axle bearings thereon, said sills being secured to said casings; engine cylinders mounted on said casings; and a wheel brace secured at its inner end to the inner casing.
9. The combination with the front and rear axles; of a frame comprising a U-shaped top sill member; a U-shaped cross piece for the front ends of the top sills telescoped with and secured thereto; bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces have collars and seats for the top and bottom sills; clamping bolts arranged through said sills and sill seats of said cross pieces and bearings; engine crank shafts; connecting gears for said crank shafts to the forward axle; casings for said crank shaft and gears having crank shafts and axle bearings and clamps for the top and bottom sills formed integrally therewith; side members for said casing provided with bearings for the outer ends of said crank shafts; and engine cylinders mounted on said casings.
10. The combination with the front and rear axles, of a frame comprising a U-shaped top sill member; a U-shaped cross piece for the front ends of the top sills telescoped with and secured thereto; bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces having seats for the top and bottom sills; clamping bolts arranged through said sills and sill seats of said cross pieces and bearings; engine crank shafts; connecting gears for said crank shafts to the forward axle; and casings for said crank shafts and gears having crank shaft and axle bearings thereon, said sills being secured to said casings.
11. The combination with the front and rear axles, of a frame comprising top and bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces having seats for the top and bottom sills; clamping bolts arranged through said sills and sill seats of said cross pieces and bearings; engine crank shafts; driving connections for said crank shafts to the forward axle; casings for said crank shafts and driving connections having crank shaft and axle bearings thereon, said sills being secured to said casings.
12. The combination with the front and rear axles, of a frame comprising top and bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces having seats for the top and bottom sills; clamping bolts arranged through said sills and sill seats of said cross pieces and bearings; engine crank shafts; driving connections for said crank shafts to the forward axle; and casings for said crank shafts and driving connections having crank shaft and axle bearings thereon, said sills being secured to said casings.
13. The combination with an axle, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to said axle; casings for said crank shaft and gears having crank shaft and axle bearings and clamps for the top and bottom sills formed integrally therewith, the top sill clamps being disposed on the upper ends of said casings, the bottom sill clamps being disposed between the axle bearings and the crank shaft portions of said casing; side members for said casing provided with bearings for the outer ends of said crank shafts; and engine cylinders mounted on said casings.
14. The combination with an axle, of a frame comprising top and bottom sills; engine crank shafts; connecting gears for said crank shafts to said axle; casings for said crank shaft and gears having crank shaft and axle bearings and clamps for the top and bottom sills formed integrally therewith; side members for said casing provided with bearings for the outer ends of said crank shafts; and engine cylinders mounted on said casings.
15. The combination with an axle, of a frame comprising sills; an engine crank shaft; connecting gears for said crank shaft to said axle; casings for said crank shaft and gears having crank shaft and axle bearings and clamps for said sills formed integrally therewith; and side members for said casing provided with bearings for the outer ends of said crank shafts.

16. The combination with an axle, of a frame comprising sills; an engine crank shaft; connecting gears for said crank shaft to said axle; and casings for said crank shaft and gears having crank shaft and axle bearings and clamps for said sills formed integrally therewith.

17. The combination with an axle, of a frame comprising sills; an engine crank shaft; connecting gears for said crank shaft and casings for said crank shaft and gears having crank shaft and axle bearings, said sills being secured to said casings; and engine cylinders mounted on said casings.

18. The combination with an axle, of a frame comprising sills; an engine crank shaft; driving connections for said crank shaft to said axle; casings for said crank shaft and driving connections having crank shaft and axle bearings thereon, said sills being secured to said casings; and engine cylinders mounted on said casings.

19. The combination with an axle, of a frame comprising sills; an engine crank shaft; driving connections for said crank shaft to said axle; and casings for said crank shaft and driving connections having crank shaft and axle bearings thereon, said sills being secured to said casings.

20. The combination with an axle, of a frame comprising top and bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces having collars and seats for the top and bottom sills; and clamping bolts arranged through said sills and sill seats of said cross pieces and bearings.

21. The combination with an axle, of a frame comprising top and bottom sills; bearings for the rear axle having bottom sill seats thereon; vertical cross pieces having seats for the bottom sills; and clamping bolts arranged through said sills and sill seats of said cross pieces and bearings.

22. The combination with an axle, of a frame comprising top and bottom sills; vertical cross pieces having collars and seats for the top and bottom sills; and clamping bolts arranged through said sills and cross piece seats.

23. The combination with an axle, of a frame comprising top and bottom sills; vertical cross pieces; top and bottom truss cross pieces having sill collars at their ends; and a connecting strap for said truss cross pieces.

24. The combination with an axle, of a frame comprising sills; cross pieces provided with sill collars and seats; and clamping bolts arranged through said sills and cross piece seats.

25. In a structure of the class described,

the combination with an axle, of a frame comprising sills; an engine crank shaft; casings for said crank shaft having clamps for said sills formed integrally therewith, said casings constituting cross members for said sills.

26. In a structure of the class described, the combination with an axle; a wheel; a frame; engine crank shafts; driving connections for said crank shafts to said axle; casings for said crank shafts; and driving connections arranged one at each side of said wheel; said casings having bearings thereon for the crank shafts and axle, and constituting frame members.

27. In a structure of the class described, the combination of a frame comprising sills; and engine crank casings constituting cross members for said sills, said crank casings being provided with clamps for said sills.

28. The combination with an axle, of a wheel; a frame; a pair of engine crank shafts; driving connections therefor to said axle; casings for said crank shafts and driving connections arranged one at each side of said wheel and having bearings thereon for said axle and the inner ends of said crank shafts; and side members for said casings having crank shaft bearings thereon for the outer ends of said crank shafts.

29. In a structure of the class described, the combination with the frame and an axle; of an engine; an engine crank shaft; driving connections for said crank shaft to said axle; a casing for said crank shaft and driving connections; a side member for said casing having a crank shaft bearing thereon; a timer member sleeved upon the crank bearing to be adjusted thereon; contact members carried by said timer member; and a contact member mounted on said crank shaft to coact therewith.

30. In a structure of the class described, the combination with the frame, of an axle; an engine; an engine crank shaft; driving connections for said crank shaft to said axle; a casing for said crank shaft, and driving connections; a timer member adjustably mounted on said casing; contact members carried by said timer member; and a contact member mounted on said crank shaft to coact therewith.

In witness whereof, we have hereunto set our hands and seals in the presence of two witnesses.

WILLIAM S. HOVEY. [L. S.]
CHARLES B. STEBBINS. [L. S.]

Witnesses:

ORLEY R. BAIRD,
ARTHUR P. COTTLE.