

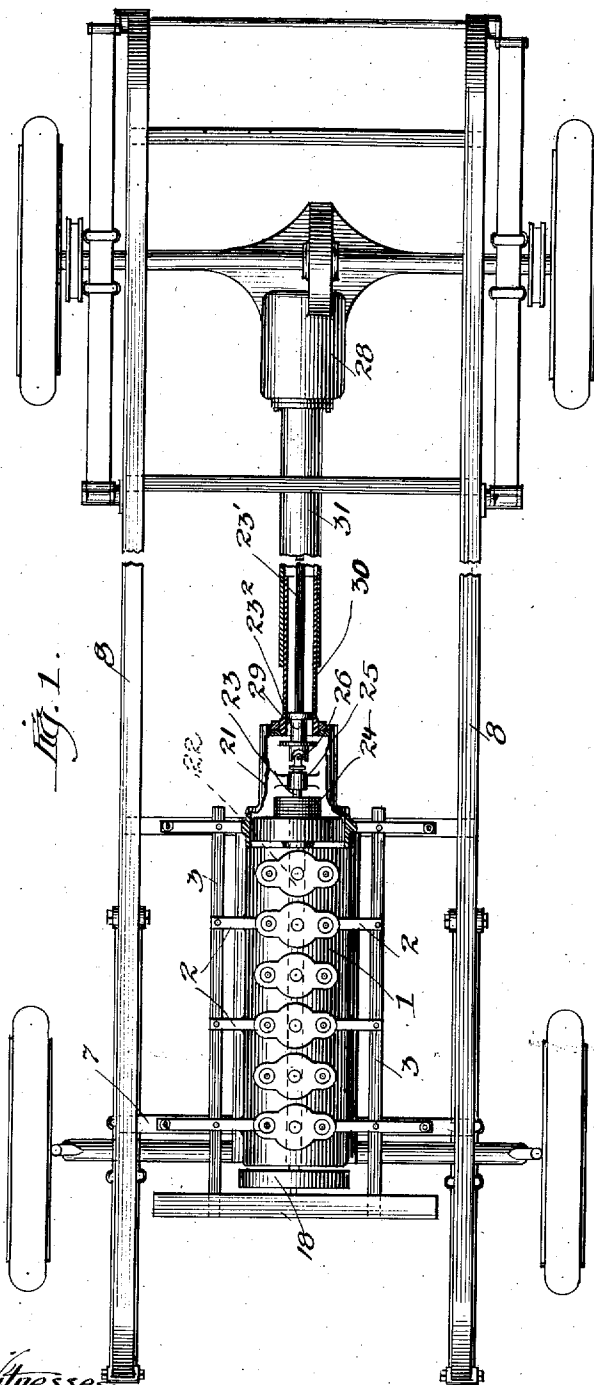
No. 874,405.

PATENTED DEC. 24, 1907.

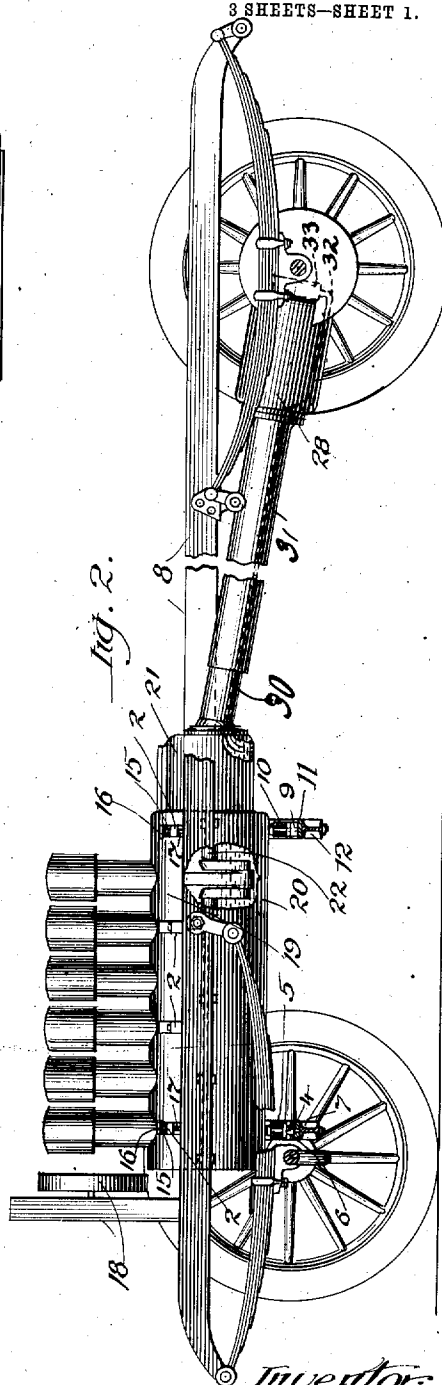
H. L. IDE.
AUTOMOBILE.

APPLICATION FILED AUG. 15, 1906.

3 SHEETS—SHEET 1.



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3 SHEETS—SHEET 2.

Fig. 3.

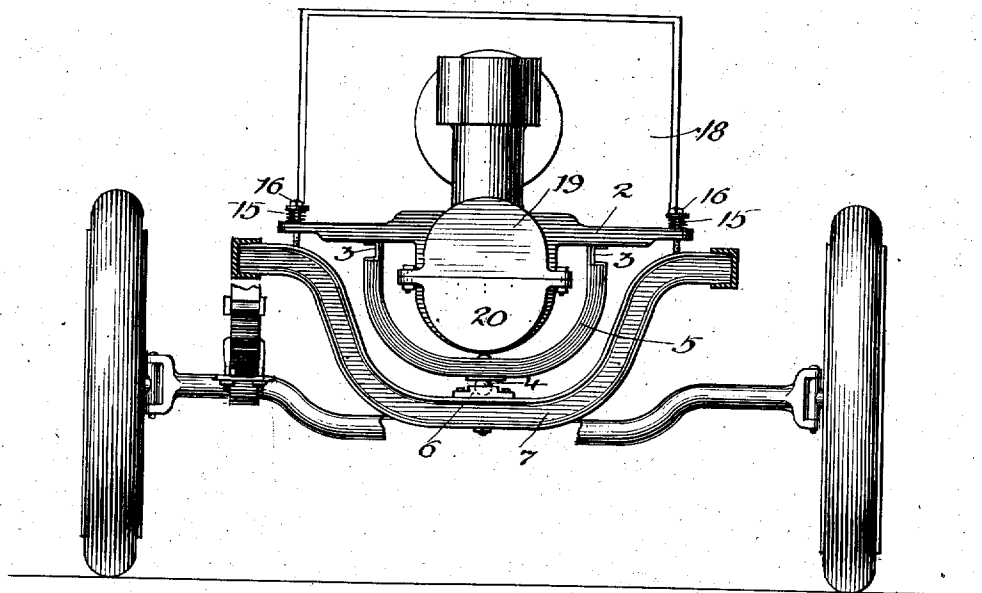


Fig. 4.

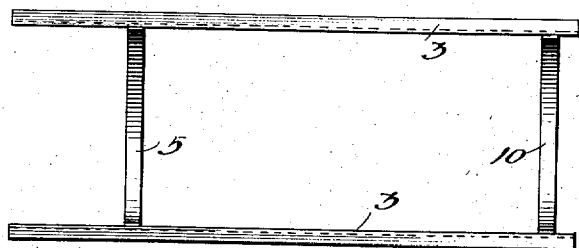


Fig. 5.

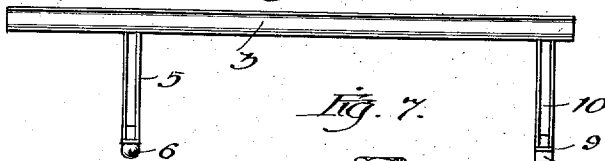


Fig. 7.

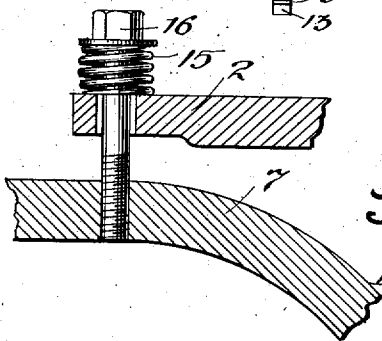
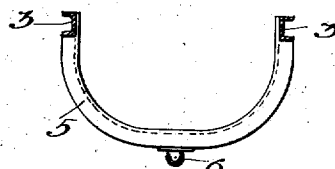


Fig. 6.



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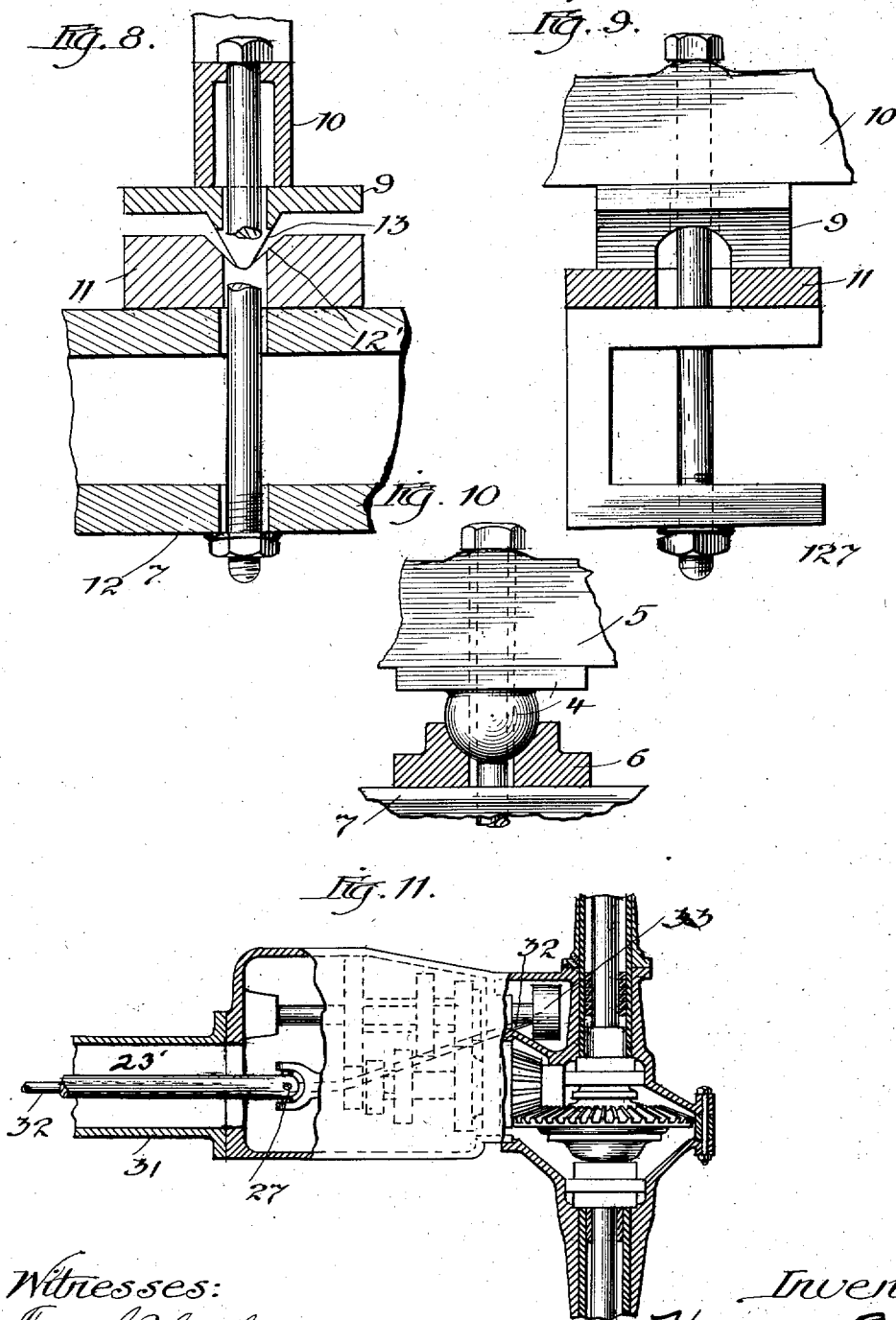
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3 SHEETS—SHEET 3.



Witnesses:
Frank Blanchard
Leon E. Stroh

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UNITED STATES PATENT OFFICE.

HARRY L. IDE, OF SPRINGFIELD, ILLINOIS.

AUTOMOBILE.

No. 874,405.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed August 15, 1906. Serial No. 330,746.

To all whom it may concern:

Be it known that I, HARRY L. IDE, citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a certain new and useful Improvement in Automobiles, of which the following is a full, clear, concise and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to automobiles, and has several objects in view.

One object of the invention is to provide an improved mounting for the motor or engine whereby relative movement may readily be permitted between the motor or engine frame or casing with respect to the main frame of the vehicle, without buckling of any of the parts of the automobile. In practicing this feature of my invention, I prefer to employ mechanism that will not only accomplish this object, but will also accomplish other objects, as will hereafter appear in the description of the preferred embodiment of the invention.

My invention has for another general object the provision of improved apparatus for permitting effective lubrication of working parts of the automobile and the provision of an improved housing for working parts of the transmission mechanism.

My invention will fully appear from the following description of the accompanying drawings, showing the preferred embodiment thereof, in which—

Figure 1 is a plan view of the frame and running gear portion of the automobile, the body being eliminated, as it is not essential in the illustration of the invention, and in order that the essential features of the invention may clearly appear. Fig. 2 is a side elevation of the construction shown in Fig. 1, with the two nearer wheels removed. Fig. 3 is a front elevation of the structure shown in Fig. 1. Fig. 4 is a plan view of the cradle directly supporting the engine, which cradle is, in turn, mounted upon the main frame of the automobile, as indicated in Fig. 1. Fig. 5 is a side view of the cradle. Fig. 6 is an end view of the cradle. Fig. 7 is a detail view showing a cushion device, several of which I prefer to interpose between the cradle and the main frame. Fig. 8 is an end view illustrating one of the supports for the engine and its cradle. Fig. 9 is a side view of the construction shown in Fig. 8. Fig. 10

is a view illustrating another one of the supports for the engine and its cradle. Fig. 11 is a detail view illustrating the rear gear case, the pump and some of the gearing therein, the pump being preferably adapted to effect circulation of the oil or equivalent lubricant.

Like parts are indicated by similar characters of reference throughout the different figures.

The engine 1, of any suitable type, is provided with a number of outsetting arms 2 that are secured at their outer ends to the longitudinal members of a cradle 3, which cradle thereupon becomes a supporting part of the engine frame, and it is this part of the engine frame that I prefer to mount upon the main frame of the machine, though I do not wish to be limited to the provision of a separately formed cradle for this purpose. I prefer the cradle, however, as it enables me to properly mount the engine with respect to a support (the cradle), which support may readily be placed in position. Moreover, the cradle in itself, being formed of skeleton frame work, affords a somewhat flexible mounting for the engine and effectively permits one of the main objects of the invention to be secured. The engine, through the intermediation of this cradle, has two supports, and preferably only two supports, disposed centrally longitudinally of the automobile. One of these supports is desirably in the form of a ball and socket construction, which may be located nearest the forward end of the automobile, the ball member 4 of which may be mounted underneath the forward yoke 5 uniting the side members of the cradle 3, while the socket member 6 may be mounted upon the yoke 7 that joins the side members of the main automobile frame 8. The mounting 4, 6 for the engine is thus preferably near the forward end of the engine and disposed beneath the same, and is of such a nature that there is no appreciable relative longitudinal movement permitted between the portion of the yoke 5 contiguous to the yoke 7. The second of the aforesaid two supports is located at the rear of the engine and also beneath the same, one member 9 being secured to and beneath the yoke 10, while the companion element 11 is mounted upon a second yoke 12 joining the side members of the frame 8. This latter mounting desirably permits the rear portion of the engine and the rear portion of the cra-

dle to move longitudinally with respect to the frame 8, so that no stress is imposed upon the frame 8, due to the contraction and expansion of the engine parts.

5 The rear portion of the engine and contiguous parts are preferably not only adapted to slide upon the element 11 but the cradle is permitted a cradle motion on this support 11, to which end a flaring groove is desirably
10 afforded in said element 11, as indicated at 12' (Fig. 8), and a projection 13, preferably V-shaped and flaring less than the groove, extends into the groove 12', said projection 13 being sufficiently high to afford desired
15 clearance between the elements 9 and 11, in order that the proper range of cradle or rocking action may be secured at the rear of the cradle, it being apparent that the support 4, 6 at the front of the cradle permits rocking
20 action of the cradle, also. The latter support prevents longitudinal thrust of the engine parts, so that the said engine may properly transmit power to the running gear.

The mounting for the engine frame that
25 desirably permits no longitudinal movement between the engine frame and the frame 8 of the vehicle, is shown partially at 6 in Figs. 5 and 6, and more completely at 4, 6 and 7 of Figs. 2 and 10, while the mounting illus-
30 trated in Figs. 8 and 9 that permits expansion and contraction of the engine frame, is shown partially in Fig. 5 at 13 and more fully in Fig. 2 at 9, 11 and 12. It will be observed that the projection 13 is somewhat
35 the nature of a knife edge that extends longitudinally of the automobile, and, being unrestricted in longitudinal movement, is permitted to move longitudinally of the automobile with respect to the frame thereof
40 for the purpose stated.

In order that vertical displacement of the cradle may be prevented, bolts 14 are passed through the elements 4, 6, 9, 11, as indicated most clearly in Figs. 8, 9 and 10.

45 The centrally disposed bearings just described are preferably the only bearings that I employ for mounting the cradle and the engine secured to the cradle, and in order that cradle action may be further promoted, I extend the forward and rear outsetting arms 2
50 so that they may overlies portions of the yokes 7 and 12 that are contiguous to the side members of the frame 8, and I employ cushion devices between the upper sides of the free ends
55 of these arms 2 and the yokes 7 and 12, whereby the rise of the said long arms 2 is resisted by said cushions but is permitted, when the automobile is sufficiently jolted, properly to cushion the engine. In the preferred em-
60 bodiment of the invention, and in the embodiment of the invention shown, these cushions do not constitute supports for the engine or its cradle, as I prefer to employ helical springs 15 (as indicated most clearly in Fig.
65 7), each located above the corresponding free

end of the engaging arm 2 and interposed between said free end and the head 16 of a bolt 17 whose shank passes freely through the arm 2 into the main frame yoke. In the construction shown, the central longitudinally dis- 70 placed bearings hitherto described are alone relied upon to afford a mounting, for it is apparent that if these two bearings were removed there would be nothing to prevent the descent of the engine and its cradle until the cradle 75 directly engaged the yokes 7 and 12, although said springs have to be interposed between the outsetting arms and the main frame yokes in order that the cushion action may be secured, and this interposition of the springs is 80 effected by the location of said springs between the heads of the bolts secured to the main frame, on the one hand, and the cradle arms, on the other. While one of the lower two bearings for the cradle and the engine act 85 to prevent bodily movement of the engine with respect to the main frame of the vehicle at one point, and the other of said two bearings permits this bodily movement, I do not wish to be limited in all embodiments of the invention to this characteristic. It will thus be seen that a very flexible mounting is afforded for the engine, which is thus relieved, to a very great extent, of the jars and violent vibrations to which the main frame 8 of the 95 machine may be subject. If desired, the cooling mechanism 18 may have advantage of the same mounting provided for the engine, by being directly secured to the cradle.

When an engine of the type illustrated is 100 employed, I preferably provide a single crank or shaft case 19 common to all of the units of the engine, which crank case may have a detachable section, as indicated at 20, which, by reason of the employment of the cradle, 105 may be very readily removed and replaced. If desired, this crank case may be filled with lubricating oil for lubricating various bearings, which same lubricating oil I preferably, though not necessarily, employ for lubricat- 110 ing bearings that are not directly included in the engine construction but which are included in the transmission mechanism affording driving connection between the engine and the traction wheels of the automobile. 115

I preferably employ a case, 21, which incloses the mechanism that establishes the union between the main driving shaft 22 of the engine and the transmission shaft 23, this case 21 constituting a continuation of the 120 crank or shaft case 19 and being virtually a part thereof. In the embodiment of the invention shown, the instrumentality that affords the connection between the shafts 22 and 23 is a well known clutch mechanism, 125 illustrated at 24.

The case 19, 21 desirably contains lubricating oil to lubricate the various bearings that are afforded for the shaft 23 and other bearings in the transmission gear. One of 130

these bearings 25 for said shaft 23 is provided in the case 21 and a universal joint 26, included in the shaft 23, is also contained in the said case 21. The rear portion of the shaft 23 includes a universal joint 27 that properly permits the driving connection between the shaft 23 and the gearing interposed between the said shaft and the driving shaft of the automobile, in a manner so well known as not to require detailed description or illustration. In order that the shaft 23 will not buckle or bind as the rear of the engine moves with respect to the wheel shaft or main frame 8 of the automobile, the shaft 23 has a portion 23¹, preferably made square in cross-section, which engages a correspondingly shaped bore in the section 23² of the shaft 23. The shaft 23 is desirably inclosed not only for the purpose of protecting the working parts from dust and dirt, but also preferably for the purpose of affording a passage for lubricating oil from the crank case 21 to the gear case 28 at the rear of the shaft 23. To this end, I employ a tube having at one end a ball and socket union at 29 with the case 21 to afford a universal connection, and at the other end being provided with some such suitable connection with the case 28, as indicated. The joint 29 permits of communication between the interior of the case 21 and the interior of said tube, while at the same time the engine may rock or the tube may rock without disturbing the union between the case and tube. In order that the rear part of the automobile mechanism may twist and move with respect to the forward mechanism of the automobile, the said tube is formed in two sections 30 and 31, one of which is inclosed by the other, and between which relative rotation may be afforded. In order that there may be relative longitudinal movement between the front mechanism and the rear mechanism of the automobile, the said sections 30, 31 of the tube are not only permitted relative rotary movement but are also adapted to slide with respect to each other. In order that the said tube may act as a conveyor for lubricant, the space between the sections 30, 31 is made sufficiently oil tight, as are the connections between the said tube and the cases united thereby. The tube 30, 31 constitutes a flexible connection between the cases 21, 28 and affords communication between these cases, whereby oil contained in the case 21 may find access through the said tube into the gear case 28. A duct 32 permits return of the oil from case 28 to the case 21, said duct preventing the accumulation of too much oil in the case 28. The return flow of the oil may be promoted by means of a small pump 33, of any suitable construction, and which may be operated by the gearing in the case 28.

The lubricating feature herein disclosed forms a part of the subject-matter of my di-

vision of this application, which divisional application bears Serial No. 351,078 and was filed January 17, 1907. Said divisional application also claims other characteristics herein disclosed.

It is, of course, understood that the gearing in the case 28 operates the rear shaft upon which the rear wheels of the automobile are provided and that the tubing 30, 31 and the case 21 form with the cases 19 and 28 a substantially continuous inclosure for the elements of the transmission mechanism operated by the motor.

I do not deem it necessary to describe any further features of the automobile illustrated as the drawings are very clear.

It will be observed that the universal joints at the end of the telescoping shaft are contained in cases. The upper universal joint is in the shaft case, while the lower universal joint is in the gear case. In this way, both universal joints may be thoroughly lubricated by lubricant contained in these cases, which lubricant is agitated by the moving parts therein.

While I have herein shown and particularly described the preferred embodiment of the invention, it is obvious that changes may be made therein without departing from the spirit of the invention, and I do not, therefore, wish to be limited to the precise construction shown, but,

Having thus described my invention, I claim as new and desire to secure by Letters-Patent:—

1. An automobile including its frame mounted upon wheels, a rocking cradle mounted upon the frame, and an operating engine mounted upon the cradle, said cradle having two bearings displaced longitudinally of the automobile and disposed substantially midway between the sides of the frame.

2. An automobile including its frame mounted upon wheels, a rocking cradle mounted upon the frame, an operating engine mounted upon the cradle, cushioning means interposed between the cradle and frame, and two bearings also interposed between the cradle and frame.

3. An automobile including its frame mounted upon wheels, a rocking cradle mounted upon the frame, and an operating engine mounted upon the cradle, said cradle having two bearings displaced longitudinally of the automobile, one of said bearings substantially preventing relative longitudinal movement between the cradle and frame, while the other of said bearings permits such longitudinal movement.

4. An automobile including its frame mounted upon wheels, a rocking cradle mounted upon the frame, an operating engine mounted upon the cradle, cushioning means interposed between the cradle and frame, and two bearings also interposed be-

tween the cradle and said frame, one of said bearings substantially preventing relative longitudinal movement between the cradle and frame, while the other of said bearings permits such longitudinal movement.

5 5. An automobile including its frame mounted upon wheels, and an operating engine mounted upon the frame, said engine having two centrally disposed bearings displaced longitudinally of the automobile, upon which the engine may rock.

6. An automobile including its frame mounted upon wheels, an operating engine mounted upon the frame, cushioning means interposed between the engine and frame, and two bearings also interposed between the engine and frame and displaced longitudinally of the automobile, upon which the engine may rock.

20 7. An automobile including its frame mounted upon wheels, and an operating engine mounted upon the frame, said engine having two bearings displaced longitudinally of the automobile, one of said bearings substantially preventing relative longitudinal movement between the engine and frame, while the other of said bearings permits such longitudinal movement.

8. An automobile including its frame mounted upon wheels, an operating engine mounted upon the frame, cushioning means interposed between the engine and frame, and two bearings also interposed between the engine and frame, one of said bearings substantially preventing relative longitudinal movement between the engine and frame, while the other of said bearings permits such longitudinal movement.

9. An automobile including its frame mounted upon wheels, and an operating engine mounted upon the frame, said engine having two bearings displaced longitudinally of the automobile, one of said bearings substantially preventing relative longitudinal

movement between the engine and frame, while the other of said bearings permits such longitudinal movement, the mounting for the engine permitting the engine to rock.

10. An automobile including its frame mounted upon wheels, an operating engine mounted upon the frame, cushioning means interposed between the engine and frame, and two bearings also interposed between the engine and said frame, one of said bearings substantially preventing relative longitudinal movement between the engine and frame, while the other of said bearings permits such longitudinal movement, the mounting for the engine permitting the engine to rock.

11. An automobile including its frame mounted upon wheels, an operating engine, and a mounting therefor substantially preventing longitudinal movement of one end of the engine with respect to the frame of the vehicle and permitting such longitudinal movement at the other end of the engine, said mounting including a cradle interposed between the engine and the frame of the vehicle.

12. An automobile including its frame mounted upon wheels, and an operating engine mounted upon the frame, said engine having two bearings displaced longitudinally of the automobile and each disposed substantially midway between the sides of the frame, one of said bearings substantially preventing relative longitudinal movement between the engine and frame, while the other of said bearings permits such longitudinal movement.

In witness whereof, I hereunto subscribe my name this 27th day of July A. D., 1906.

HARRY L. IDE.

Witnesses:

FRED W. LONG,
G. L. HARNSBERGER.