E. V. HAMMOND.

MOTORCYCLE.

APPLICATION FILED NOV. 21, 1916.

1,339,387. **Patented May 11, 1920.**

2 SHEETS—SHEET 1.

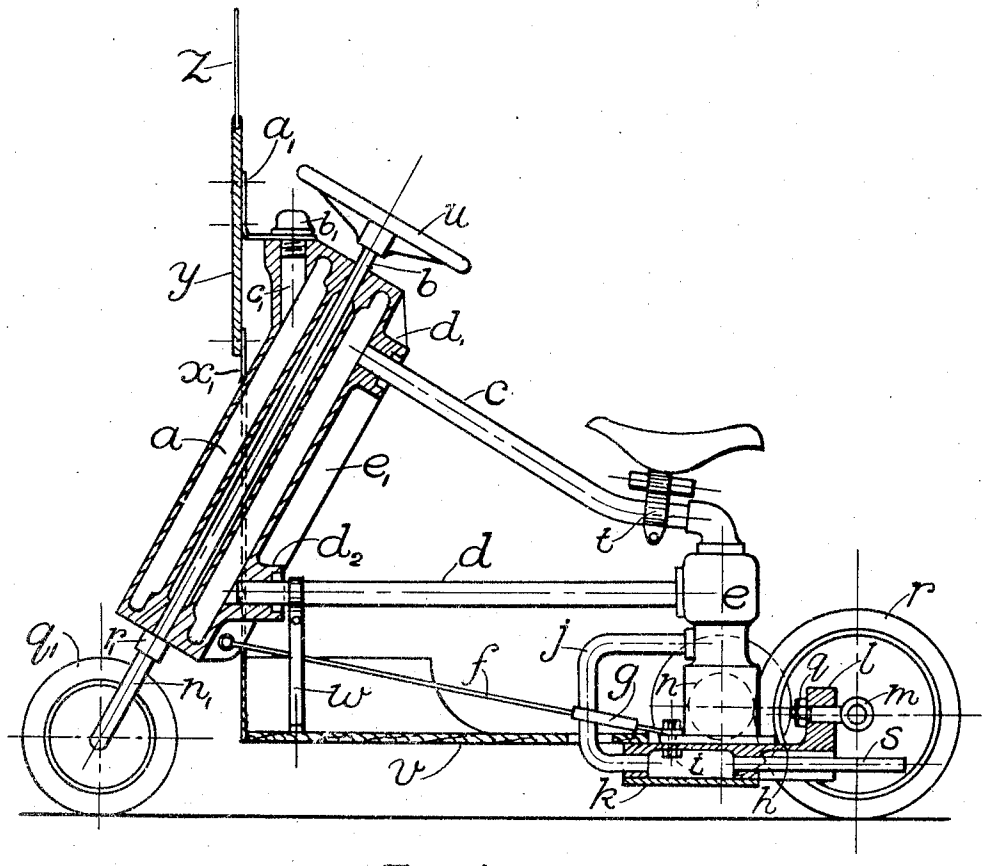


FIG. 1.

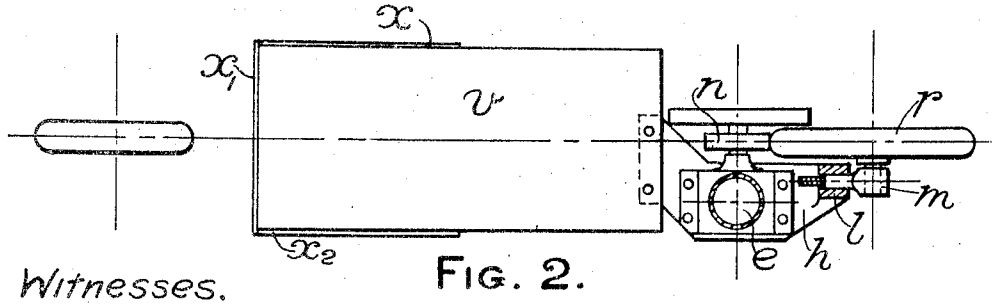


FIG. 2.

Witnesses.

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2 SHEETS—SHEET 2.

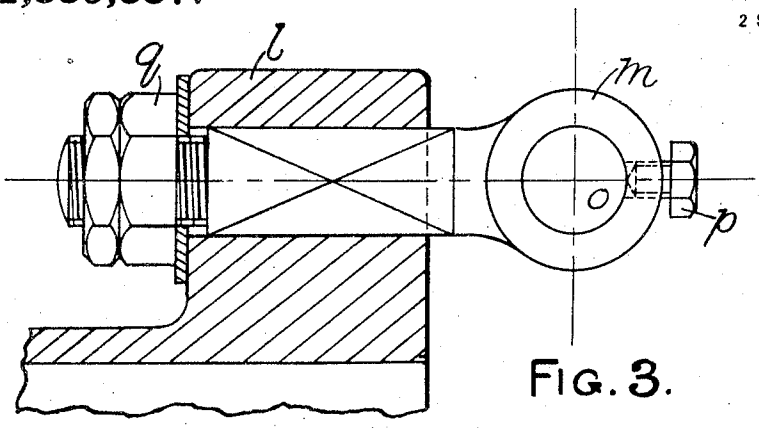


FIG. 3.

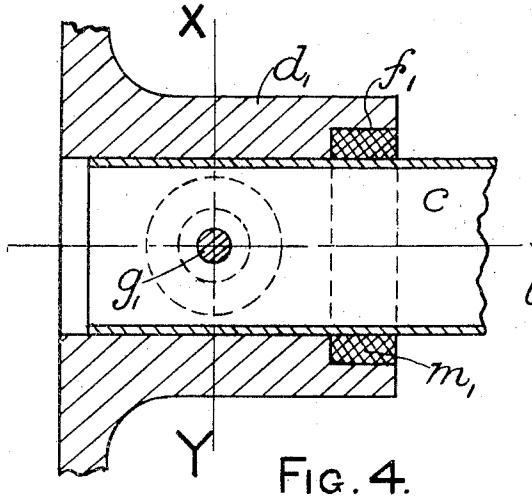


FIG. 4.

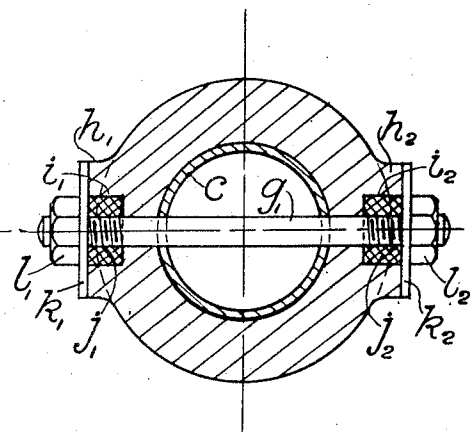


FIG. 5.

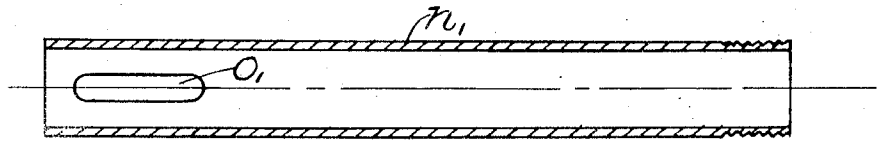


FIG. 6.

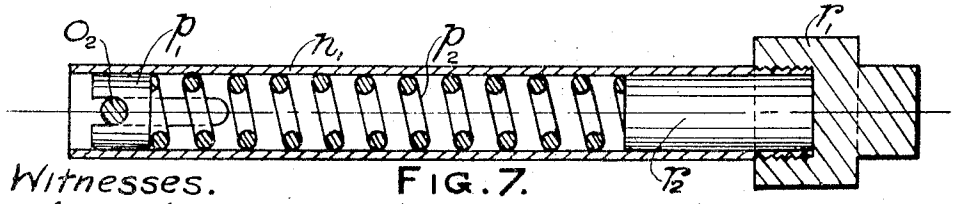


FIG. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD VICTOR HAMMOND, OF BALHAM, LONDON, ENGLAND.

MOTORCYCLE.

1,339,387. Specification of Letters Patent. Patented May 11, 1920.

Application filed November 21, 1916. Serial No. 132,620.

To all whom it may concern:

Be it known that I, EDWARD VICTOR HAMMOND, a subject of the United Kingdom of Great Britain, residing at No. 88 Louisville road, Balham, in the city of London, county of Surrey, England, and Kingdom of Great Britain, have invented a new and useful Motorcycle, of which the following is a specification.

The object of this invention is to simplify and cheapen the production of motor cycles, or similar vehicles propelled by water cooled internal combustion engines, while at the same time affording a very low seating position for the rider, (and consequently a low center of gravity) and also affording that protection from the weather hitherto only found on motor cars.

With reference to the accompanying drawings, Figure 1 represents an elevation of the motor cycle, Fig. 2 represents a plan of the base or "chassis", while Figs. 3, 4, 5, 6 and 7 represent enlarged views of details of construction.

The principal feature of this invention is the use of the water outlet and inlet pipes from the engine to the radiator or cooling tank, to form the actual frame of the machine; or in other words, to utilize the tubular framework of the motor cycle, as water outlet and inlet pipes from engine to radiator. In this invention the usual form of radiator, either "honeycomb" or composed of layers or coils of tubing may be dispensed with, and a plain cylindrical tank *a*, Fig. 1, used in its stead. This tank may be cylindrical, rectangular, "streamline", or of any other shape, and may be cast in one piece, or formed in any other fashion most suitable to the manufacturer. The steering column *b*, Fig. 1, passes through the tank *a*, which tank is preferably placed in the position shown in Fig. 1; in which position it forms the steering head of the bicycle in addition to fulfilling its function as a cooling tank. Radiating gills, such as are used on air cooled petrol engine cylinders, may be placed or formed upon the tank if desired, to assist the cooling. Any other form of radiator or cooling vessel may be used if desired.

The water outlet pipe is shown at *c*, Fig. 1, and forms the top tube of the motor cycle frame. The water inlet pipe is shown at *d*, Fig. 1, and forms the bottom tube of the frame. The engine, shown at *e*, Fig. 1, is preferably placed at the rear of the motor cycle and is utilized as part of the framework of the motor cycle, as it takes the place of a vertical tube or stay. The engine *e*, cooling tank *a*, and pipes *c*, and *d*, may be disposed in any other position or positions relative to each other than that shown in Fig. 1, if so desired. The whole frame is strengthened by a tension rod shown at *f*, Fig. 1, the tension of the rod being adjusted by the turnbuckle *g*, Fig. 1. The forward end of the tension rod is secured to a lug, or by other suitable means, to the tank *a;* and the rear end of the rod is secured to one holding down bolt of the engine *e*, or other suitable anchorage. The engine *e*, stands upon the platform *h;* this platform *h*, contains the hollow chamber *i*, which chamber is used as a silencer for the exhaust gases, and communicates with the engine exhaust port by the exhaust pipe *j*, Fig. 1. The hollow chamber has a detachable cover plate *k*, Fig. 1, to admit of ready access to the holding down bolts of the engine, and also cleaning out the silencer. Formed in one piece with the base plate *h*, is the lug *l*, which lug holds a sliding bracket *m*. The lug and sliding bracket are shown in detail at Fig. 3 of the accompanying drawings. The drive from the engine to the rear wheel is by friction contact of a driving pulley *n*, Fig. 1, Fig. 2, on the engine, with the tire of the rear wheel of the motor cycle. Owing to the tendency of the friction drive to slip when the roads are wet, the sliding bracket *m* is provided; which bracket holds the spindle or hub of the rear wheel in the boss *o* Fig. 3; the spindle being secured by the set screw *p*, Fig. 3, or other suitable means. A flat facing, key, or other suitable contrivance may be used on the sliding bracket *m*, to prevent it turning about in the lug *l*. Upon tightening up the nut *q*, Fig. 1 and Fig. 3; the rear road wheel *r*, Fig. 1 and Fig. 2; is drawn hard against the pulley *n*, thereby increasing the frictional force between road wheel and pulley, and diminishing the tendency to slip. The base plate *h*, lug *l*, and hollow chamber *i*, are preferably formed in one complete piece for economy of manufacture, but may be formed separately if desired. An exhaust pipe is shown at *s*, Fig. 1.

The engine used on this motor cycle is preferably of the "two stroke" or valveless type, with cylinder and crank case cast in

one complete piece as described in my British specification No. 7530/15, although any other type of engine may be used.

The usual "seat pillar" provided on motor cycles is dispensed with; the saddle or seat being secured to the top frame tube c, by a clip t, Fig. 1. Steering is preferably controlled by a motor car type of steering wheel as shown at u, Fig. 1; but any form of tiller or handle bar may be used if desired.

A substantial footboard or footplate is provided at v, Fig. 1 and Fig. 2, which may be of wood, metal, or other material. In Fig. 1 the footboard is shown of wood, and is secured by bolts or other suitable means, to the forward end of the base plate h; and is supported by a metal strap, clip, or other means from any suitable point along the bottom tube d, or tank a, as shown at w, in Fig. 1. Side and front mud and wind shields to protect the feet and legs of the rider are represented by x, x_1, x_2, in Fig. 1 and Fig. 2. These wind shields may be of wood or metal as desired. The front shield x_1, is carried up on each side of the tank a, to meet the body wind screen y, which wind screen (to protect the body of the rider), may be of wood or metal, and either continuous with the front mud and wind screen x_1, or formed in a separate piece as shown at y, Fig. 1. This wind screen is surmounted by a glass face screen z, in the fashion adopted in motor cars. The wind screen y, is carried by a bracket a_1, carried underneath the filler cap b_1, Fig. 1, or by other suitable means. The cooling tank a, is filled at a suitable orifice c_1, Fig. 1.

A means of making a water-tight joint where the top and bottom tubes c, and d, enter the water tank a, is shown in large sized detail in Figs. 4 and 5 of the accompanying drawings. In Fig. 1, bosses are provided on the tank a, as shown at d_1 and d_2 Fig. 1, which bosses are strengthened by the connecting rib e_1, Fig. 1.

A section through one of the bosses is shown at Fig. 4; d_1 being the boss, and c, the top (or water outlet) tube.

A recess is formed in the boss d_1 as shown at f_1, Fig. 4; and into this recess is forced a ring m_1, of rubber or other suitable elastic material of larger outside diameter than the recess f_1, and of smaller inside diameter than the tube c, which ring, by pressing upon the sides of the recess f_1 and also upon the tube c, will, by reason of its compression, form a water-tight joint, unaffected by vibration. To hold the tube c in position, a bolt g_1 is passed through the boss d_1 at a suitable point shown on the line X. Y. in Fig. 4, a transverse section on the line X. Y. being shown at Fig. 5. On the main boss d_1, additional bosses h_1 and h_2, Fig. 5, are formed. These bosses are provided with recesses i_1, i_2, Fig. 5, into which recesses are forced rings of rubber or other elastic material j_1, j_2, having precisely the same effect as the joint between the boss d_1 and the tube c, as previously described. The bolt g_1, Fig. 5, is secured by the nuts and collars k_1, k_2, and l_1, l_2, Fig. 5. The top tube in Fig. 5 is shown at c.

A simple means of springing the front wheel of the motor cycle is provided by using tubing to form the forks shown at n_1, Figs. 1, 6, and 7. One end of the tubing receives the fork crown, which in this instance is shown screwed to the tubing, but may be secured by welding, brazing, or in any other suitable manner. In the lower end of the tubing, (which receives the spindle of the front road wheel q_1) there is formed a slot as shown at o_1, Fig. 6. This slot receives the ends of the spindle (one on each side of the wheel) as shown at o_2, Fig. 7. The spindle end engages with a slot in a plunger p_1, Fig. 7. This plunger supports the lower end of a coiled spring p_2, which spring is placed within the tube n_1. As will now be clearly seen by reference to Fig. 7 of the accompanying drawings, shocks to the front road wheel q_1, will be transmitted through the spindle o_2 (which spindle is free to slide up and down the slot o_1 in the tube n_1) to the plunger p_1, which will in turn compress the spring p_2, thus absorbing the road shock. The fork crown is shown at r_1, Fig. 1, and Fig. 7, and a distance piece is shown at r_2, Fig. 7, which distance piece is used for adjusting the spring p_2. This distance piece can be an elongation of the crown r_1 if desired.

With further regard to the water cooling, it may be mentioned that "thermo-siphon," or natural circulation, is relied upon to circulate the cooling water, but a pump may be fitted if desired.

I claim—

1. In a motor cycle, a frame including a tubular steering head, upper and lower tubular members connected to said head, and an engine having a water jacket in the angle between and connected to said tubular members, so that said water jacket forms a portion of said frame and cooling water is caused to circulate through said jacket, said steering head and said tubular members.

2. In a motor cycle, a frame including a tubular steering head, upper and lower tubular members connected to said head, an engine having a base plate and also having a water jacket, said water jacket being connected to said tubular members, and a footboard having its front end connected to said frame and its rear end secured to said base plate.

3. In a motor cycle, a frame including a steering head and upper and lower reach members attached thereto, an engine having a member attached to and connecting the

rear ends of said reach members and also having a base plate, a rear wheel having its axle mounted in said base plate, and a drive wheel on the shaft of the engine and frictionally engaging said rear wheel.

4. In a motor cycle, a frame including a steering head and upper and lower reach members attached thereto, an engine having a member attached to and connecting the rear ends of said reach members and also having a base plate, a rear wheel having its axle adjustably mounted in said base plate, and a drive wheel on the shaft of the engine and frictionally engaging said rear wheel.

5. In a motor cycle, a frame including a steering head and upper and lower reach members attached thereto, an engine having a member attached to and connecting the rear ends of said reach members and also having a base plate provided with an exhaust muffling chamber, an exhaust pipe connecting the engine with said chamber, and a rear wheel having its axle mounted on said base plate.

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Witnesses:
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