

J. B. BEAM.
RADIATOR.

APPLICATION FILED JULY 26, 1911.

1,026,895.

Patented May 21, 1912.

3 SHEETS-SHEET 1.

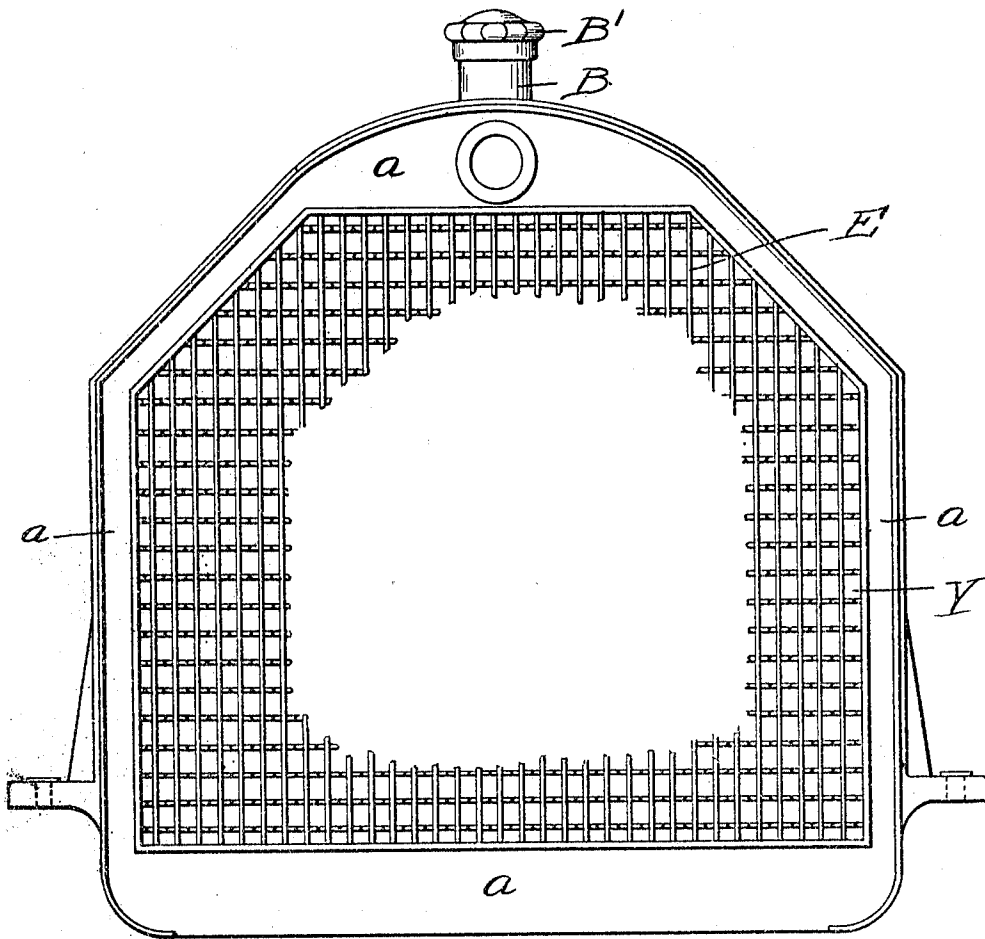


Fig. 1.

Witnesses

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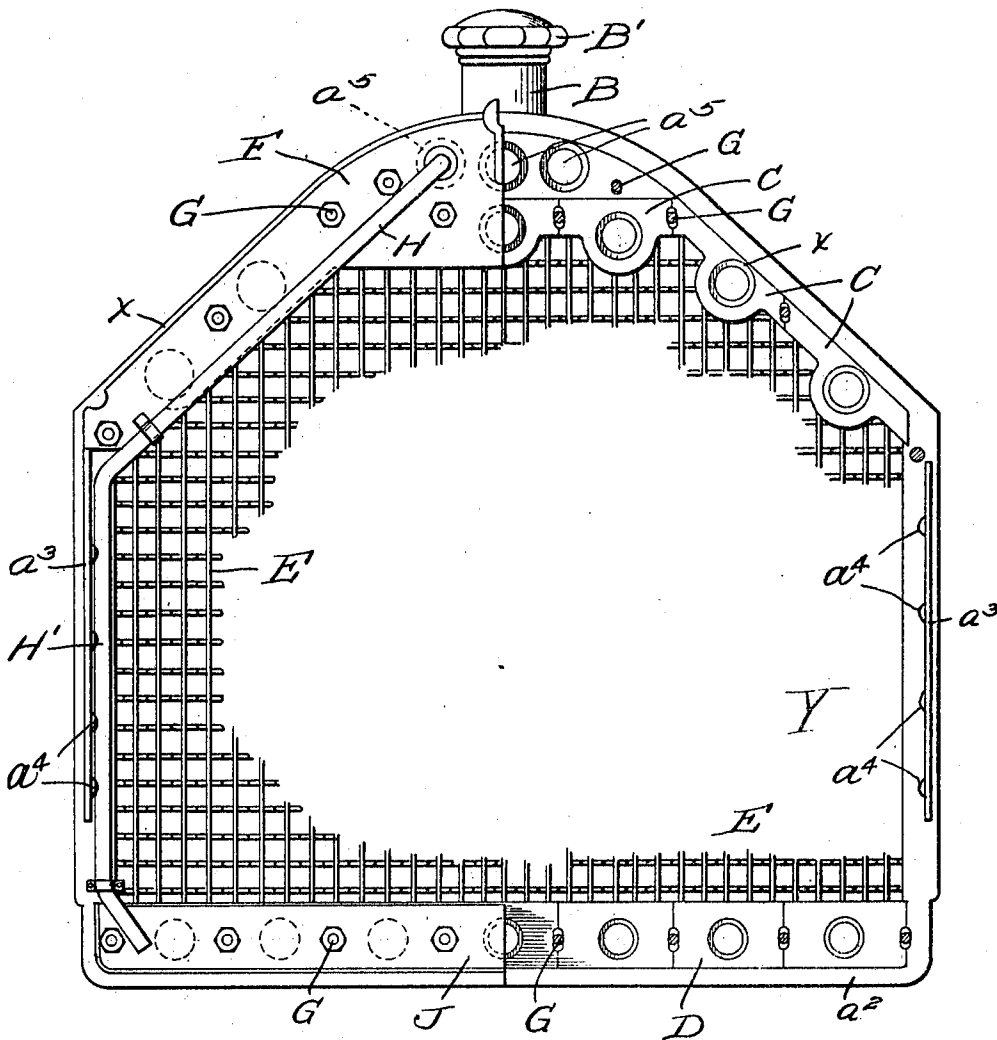
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3 SHEETS-SHEET 2.

FIG. 2.



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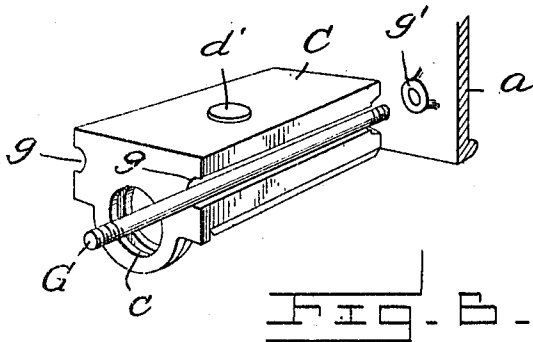
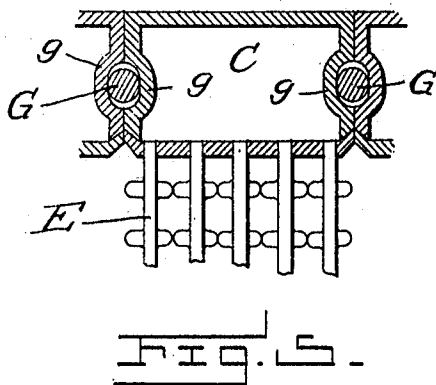
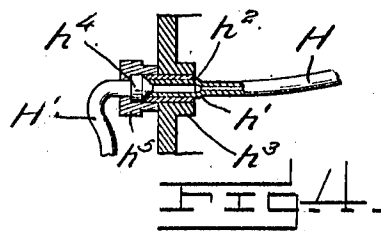
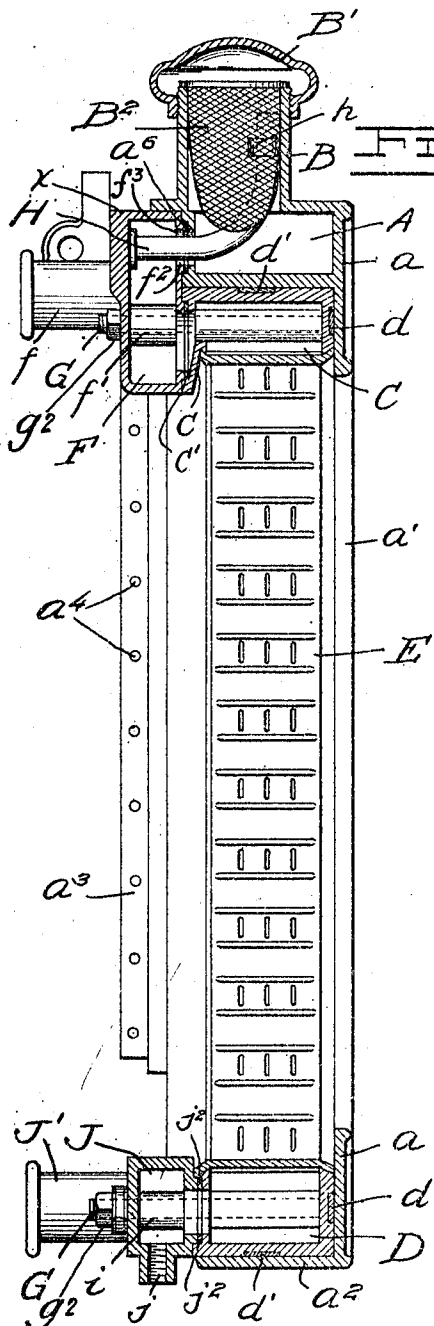
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UNITED STATES PATENT OFFICE.

JACOB B. BEAM, OF PUNXSUTAWNEY, PENNSYLVANIA.

RADIATOR.

1,026,895.

Specification of Letters Patent.

Patented May 21, 1912.

Original application filed February 16, 1911, Serial No. 608,944. Divided and this application filed July 26, 1911. Serial No. 640,656.

To all whom it may concern:

Be it known that I, JACOB B. BEAM, a citizen of the United States, residing in Punxsutawney, in the county of Jefferson and State of Pennsylvania, have invented certain new and useful Improvements in Radiators, of which the following is a specification.

My invention relates particularly to radiators of the class employed in automobiles to cool the water which circulates in the jackets of the engine cylinders, and the object of my invention is to provide a radiator of this class which shall be strong and durable, not liable to leak and which can be easily repaired when for any unusual reason any of the parts are accidentally broken.

A further object of my invention is to so construct the radiator that any desired design may be employed for the front thereof and yet radiator sections can be used which can be inserted in or removed from the rear portion of the radiator frame without detaching any part of the front frame or disfiguring the front frame with fastening devices.

In the accompanying drawings, Figure 1 shows a front elevation of an automobile radiator to which my improvements may be applied. Fig. 2 shows a rear elevation of the same with parts broken away to illustrate how my improvements are applied. Fig. 3 shows a vertical central section of the radiator shown in Figs. 1 and 2. Fig. 4 is a detail view of the joint between the inner and outer members of the overflow pipe. Fig. 5 is a detail view in section showing how the headers of the radiator sections are secured in the radiator frame. Fig. 6 is a perspective view further illustrating this feature of the invention.

The chamber A at the top of the radiator which is cast in one piece without seam has a filling tube B having a removable cap B' of usual construction. Within the filling tube I preferably arrange a strainer B². The chamber A is formed integrally with a front wall *a* and side walls *a'* and a bottom wall *a*². The front wall *a* extends entirely around the central opening Y of the radiator and the side walls extend rearwardly being provided at the rear with a flange *a*³ containing buttons *a*⁴ of some soft material and adapted to press against the front end of the hood which fits over the portions *a*³

at the sides of the frame. By constructing the chamber A integrally with the sides and bottom of the frame a rigid seamless structure is provided so that there is no danger of leakage and the tubes E are held rigidly in place, that is to say, inasmuch as the frame is made integral there will be no opening and closing of joints in the frame which would otherwise occur and which would tend to loosen the connections between the tubes and the headers. The chamber A is provided mainly to facilitate in filling the radiator with water and to provide a space into which the water may rise when overheated. It is not necessarily part of the circulating system.

I employ a series of radiator sections similar in construction to those described in my application for Patent No. 608,944 filed February 16, 1911 of which this case is a division. Each section of the radiator comprises an upper header C and a lower header D. These headers are connected by tubes E of the construction shown and described in my original application. The radiator sections are separately removable from the radiator frame. The upper header C fits in the frame behind the front wall of the radiator frame and immediately below the bottom wall of the chamber A. Packing *d*, *d'* is contained in recesses in the front walls and in the top walls of the radiator sections bearing against the adjacent surfaces and insuring a tight fit between the parts so as to prevent vibration.

It will be observed by reference to Fig. 2 that inasmuch as the top portion of the radiator is considerably inclined it is necessary in order to obtain a wide opening for the radiator tubes to give to the upper headers of the radiator sections different shapes, that is to say, the lowermost upper headers on opposite sides are diagonally inclined as are also those next to these lowermost headers, while the upper headers (three being shown) have straight or horizontal tops. The lower headers are all of substantially the same shape. The several upper water headers C are connected with the chamber A by a water leg F which is provided with a pipe connection *f* leading to the water jackets of the engine and which is formed integrally with a series of sleeves *f'* extending horizontally through the chamber to receive the securing bolts. The rear end of the

chamber A is formed with openings a^5 (three being shown) which communicate with openings f^2 in the water leg F. Each opening a^5 is surrounded by packing a^6 arranged in an annular recess and each opening f^2 is surrounded by a boss or flange f^3 which fits against the packing. In this way communication is established between the chamber A and the water leg F. Each header C is provided with an opening c which communicates with the water leg F. This opening c is surrounded by a packing c' and the opening at f^4 in the water leg is surrounded by a flange bearing against the packing. The water leg F is A-shaped, its upper portion communicating with the chamber A through the openings a^5 while the side portions or branches of the water leg extend diagonally downward and outward behind the rear ends of the upper headers of the radiator sections and communicate therewith through the openings c .

The hood of the automobile is adapted to rest on the edges x of the water leg F, see Fig. 2, and to extend over the flanges a^3 . The sides of the upper header have curved portions g as shown to accommodate the bolts G. These curved portions are elongated, as shown in Fig. 5, and when the headers C are placed side by side oval openings are formed to accommodate the bolts and the headers therefore have some freedom of movement vertically on the bolts while being adjusted. The oval openings also allow the headers to expand to some extent without throwing strain on the bolts and the connected casing.

When the headers are in position the bolts G are passed through the sleeves f' through the openings formed at g and into threaded sockets g' in the front frame. By this construction the upper headers can be firmly connected with the top of the frame and with the water leg F. It will be observed that the headers are not formed with openings to accommodate the bolts G as these bolts pass between the headers and on the outside thereof and they also pass through sleeves f' formed integrally with the water leg so that there is no danger of leakage. The bolts may be removed by unscrewing them from the sockets g' and the headers may be rigidly secured in the frame by tightening the nuts g^2 .

I preferably employ an overflow pipe H, as indicated in Figs. 3 and 4. This pipe is formed in sections, the upper section H being curved and supported by any suitable device at h in the filling tube B. At its lower end the pipe H is enlarged, as indicated at h' and this enlarged portion extends into a sleeve h^2 fitting in a hollow boss h^3 in the side frame. The outer section H' is provided at its upper end with a conical head h^4 which fits into a conical opening

formed in the outer end of the pipe H. A cap h^5 screws onto the outer end of the sleeve h^2 and surrounds the head h^4 . The cap firmly holds the head h^4 in connection with the pipe H. By this construction I am enabled to remove the overflow pipe sections from the radiator and clean them, the pipe section H' being on the outside can readily be detached after separating the cap h^5 . As the outer or lower end of the pipe section H is enlarged the opening in the sleeve is correspondingly enlarged. When the enlarged lower portion of the pipe is drawn outward, an opening is provided which is larger in diameter than the inner part of the pipe section H and therefore this pipe, although curved, can be readily withdrawn.

The lower headers D are similar in construction to the upper headers C. Packings d, d' are provided similar to the packings in the upper headers and for a similar purpose. Bolts G similar to those before described are employed and these bolts extend through openings between the sides of the headers similar to those shown in Fig. 5, and the bolts also pass through sleeves i similar to the sleeves f' . These sleeves are formed integrally with the walls of the lower water leg J which is provided with a drainage orifice j and with a branch pipe J' adapted to be connected with the water jackets of the engine. Packed joints are formed at j^2 between the rear portions of the lower headers and the water leg J. By this construction I am enabled to apply my improvements to a radiator of the shape shown in Fig. 1, and yet provide chambers of sufficient area to circulate the proper amount of water.

The radiator sections are separately removable. When the lower bolts G are detached, the lower water leg J can be separated and by removing the bolts G at the top the upper water leg F can be removed and then any radiator section may be withdrawn and replaced by a new one or returned after it has been repaired. When on the road if any radiator sections have been withdrawn, the openings in the water legs corresponding with the removed radiator sections may be closed by suitable stoppers and the car can proceed on its journey for a time without much leakage.

I claim as my invention:

1. An automobile radiator, comprising a frame, a chamber at the top thereof provided with a filling opening, a water leg connected with the upper part of the frame and communicating with said chamber; a series of independently removable radiator sections comprising upper headers communicating with the upper water leg and bearing against the bottom of said chamber and against the upper part of the front frame of the radiator and lower headers resting on

the bottom of the radiator frame and bearing against the lower part of the front frame, and vertical tubes communicating with the upper and lower headers; and a lower water leg communicating with the lower headers and detachably connected with the lower part of the radiator frame.

2. An automobile radiator, comprising a radiator frame, a chamber at the upper part thereof having a filling opening, a water leg in rear of said chamber communicating therewith and having horizontal bolt-receiving sleeves extending through it, a series of upper radiator headers arranged in close contact with each other, communicating with the water leg and having elongated bolt-receiving grooves in their sides, bolts extending through the sleeves of said chamber and through the grooves of the headers and connected with the radiator frame, a series of lower headers having elongated bolt-receiving grooves in their sides, a lower water leg communicating with the lower headers and having bolt-receiving sleeves extending through it, tubes connecting the upper and lower headers and bolts extending through the sleeves and grooves and connected to the radiator frame for detachably connecting the lower water leg, headers and frame together.

3. A radiator, comprising a radiator frame, a chamber at the top thereof, a lower water leg detachably connected with the lower part of the radiator frame, a water leg secured at the rear of the chamber at the top of the frame, communicating therewith and having sides or branches extending diagonally downward and outward therefrom, and a series of independently removable vertically arranged radiator sections of different lengths, comprising upper and lower headers, and vertical connecting tubes, said lower headers being connected with the

lower water leg and said upper headers being arranged in different horizontal planes in front of the upper water leg and having separate connections therewith some with the top of the water leg and others with the downwardly extending branches thereof.

4. A radiator, comprising a radiator frame, a chamber at the top thereof having a filling opening, a series of upper radiator headers detachably connected with each other and with the frame and arranged horizontally below the chamber in the top of the frame, and a series of radiator headers arranged in series on opposite sides of the first mentioned headers and extending downward and outward therefrom, a water leg having an upper horizontal portion and sides or branches extending diagonally downward and outward therefrom arranged in rear of said headers and communicating separately with all of them, lower headers, vertical tubes connecting the upper and lower headers and a water leg communicating separately with the lower headers and detachably connected therewith.

5. An automobile radiator, comprising a radiator frame, a series of independently removable radiator sections mounted in said frame and resting on and supported by the bottom thereof, an upper water leg communicating with the headers at the top of the radiator sections, means for detachably connecting said water leg with the radiator frame, and a lower water leg communicating with the lower headers and detachably connected therewith.

In testimony whereof, I have hereunto subscribed my name.

JACOB B. BEAM.

Witnesses:

LOTT D. CRAFT,
JESSE C. LONG.