

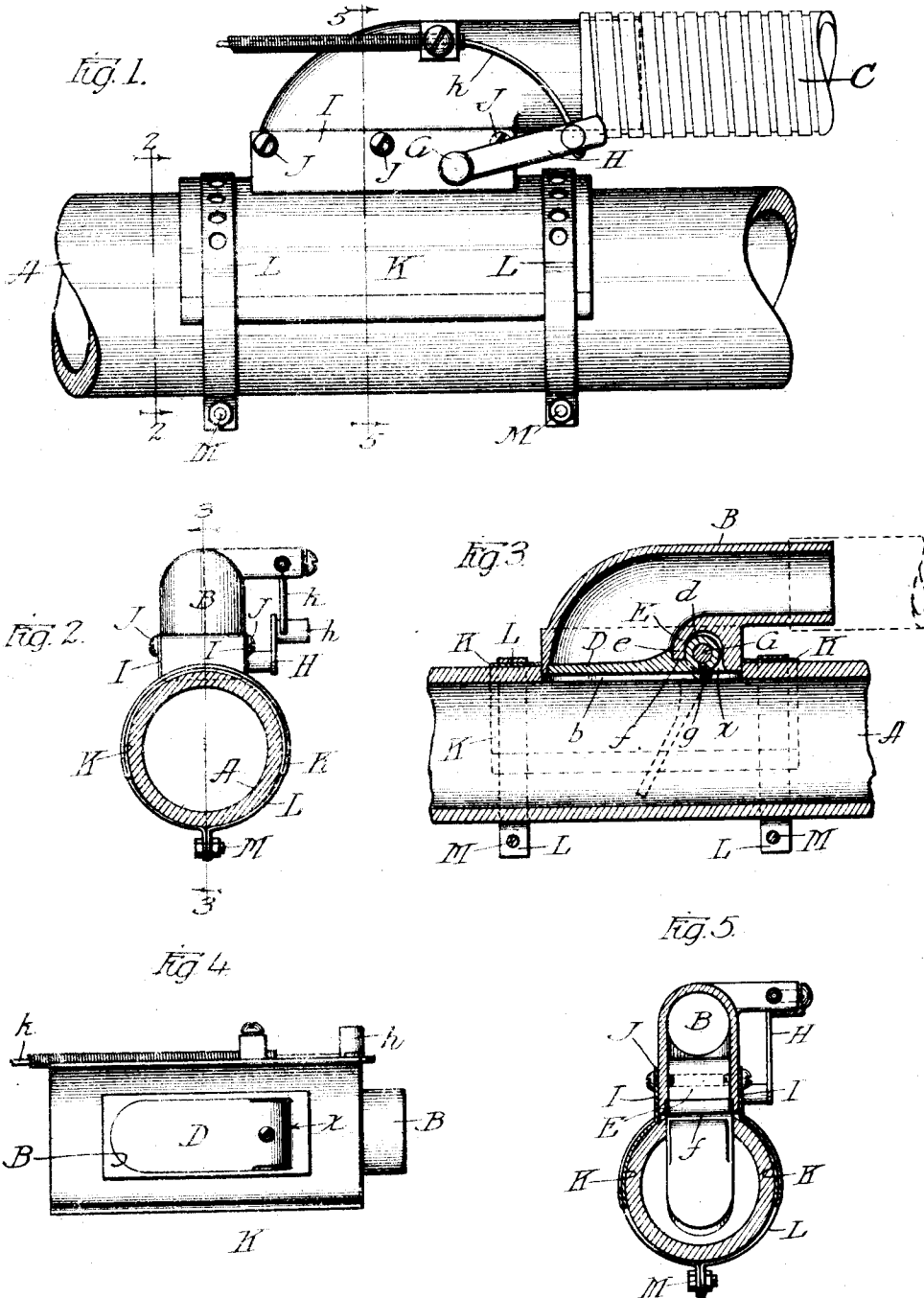
T. M. ROBERTS AND T. BOVEY.

CUT-OUT VALVE.

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1,368,970.

Patented Feb. 15, 1921.



Witnesses:
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UNITED STATES PATENT OFFICE.

THOMAS M. ROBERTS AND THOMAS BOVEY, OF CHICAGO, ILLINOIS.

CUT-OUT VALVE.

1,368,970.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, THOMAS M. ROBERTS and THOMAS BOVEY, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Cut-Out Valves, of which the following is a full, clear, and exact description.

Our invention relates to cut-out valves, and particularly for diverting the exhaust from the internal combustion engine of an automobile into a pipe leading from the discharge pipe thereof to a radiator for heating the limousine of an automobile.

Heretofore it has been customary to make and keep in stock a great number of different sized cut-out valves in order to supply the demand created by their use in conjunction with different sizes of exhaust pipes employed in the different makes of automobiles. Our invention is designed to overcome this objection and to enable a standard cut-out valve to be used in connection with the exhaust pipes of all of the different makes of automobiles.

One of the principal objections to the use of automobile heaters heated by the exhaust of the engines thereof is the accumulation of carbon around the seat of the cut-out valve that diverts the exhaust to the heater, which sooner or later makes the valve leaky and renders it impossible to keep the heated exhaust out of the heater and produces a heat in the limousine of the car which in mild weather renders it very uncomfortable.

Another objection, particularly during times when the supply of metal is small and its cost prohibitive, is the necessity of using comparatively heavy castings, which the construction of cut-out valves heretofore employed, made imperative. Our invention avoids this objection and minimizes the amount of metal employed, and greatly reduces the cost of manufacture of the same.

In the following description of our invention and in the accompanying drawings, similar reference characters refer to like parts.

In the drawings:

Figure 1 is a side view of our invention.

Fig. 2 is a transverse section of the same taken on line 2—2, Fig. 1.

Fig. 3 is a longitudinal section taken on line 3—3, Fig. 2.

Fig. 4 is a plan view of the underside of our improved valve.

Fig. 5 is a transverse section taken on line 5—5, Fig. 1.

Our invention is particularly adapted for use in connection with the automobile heater invented by Thomas Bovey, for which Letters Patent of the United States were granted to him August 15, 1916, No. 1,194,473. Our improved valve is used in the same relative position to and is connected with the heater in the same manner as set forth in said patent, and the means employed for operating said valve are substantially the same.

The exhaust pipe A—only a portion of which is shown in the drawings—leads from the gas or internal combustion engine (not shown), and in order to divert a portion or all of the heated products of combustion to the heater in the limousine, an elbow B is employed that connects exhaust pipe A to the pipe C that leads therefrom to the heater (not shown).

The entrance end *b* of the elbow is elongated in the direction of length of the exhaust pipe, and is, preferably, rectangular, and its edges are all in the same plane. The entrance opening inclosed by said edges constitutes the valve-seat; the end thereof nearest the engine is, preferably, semi-circular or rounded, and the edges of said seat are, preferably, rabbeted or beveled. This valve-seat is adapted to be closed by a flat valve D that corresponds in outline to said seat, and is provided with a transverse knuckle *d* at its rear end, the semi-cylindrical sides of which round said end and roll upward into the adjacent valve seat and form a transverse depression, as at *e*, between the rear end of the valve and the rear end of the valve-seat. The object of this depression *e* is, when the valve is closed, to enable the heated products of combustion, as they rush past in the exhaust pipe, to create a suction or vacuum, that pulls the products of combustion, that might otherwise have a tendency to leak around the edges of the valve out of the elbow into the exhaust pipe, and thus prevent the accumulation of carbon in the valve-seat and on the edges of the valve engaging said seat. In order to more effectively accomplish this object, the rear end of the valve-seat is provided with a shield E, which latter connects and is made inte-

gral with the side-walls of said elbow just above said seat and arches over said knuckle, and when said valve is closed the forward transverse edges *e* of this shield enter a transverse groove *f* in the upper or inner surface of the valve and prevent the heated products of combustion from leaking around the pivoted end of the valve into the elbow.

10 The valve is pivoted by means of a transverse rock-shaft or spindle *G* which extends through said knuckle and is secured thereto by a set-screw *g*. This spindle is journaled in bearings in the side-walls of the rear end of the valve-seat, and one end of said spindle 15 extends through its bearings and has a crank-arm *H* projecting rearwardly therefrom, the handle *h* of which has a flexible wire *k* secured to and leading therefrom by means of which it is moved to open and close the valve.

Exhaust-pipe *A* has a longitudinally elongated opening therein where the flattened elongated end of elbow *B* is attached thereto. The elbow is attached to the exhaust-pipe very securely by means of a flexible plate of sheet metal *K*. This plate is, preferably, of a rectangular shape, and it has a central opening therein for the reception of the adjacent rectangular end of the elbow. When making this opening, transverse cuts are made in said plate the length of which corresponds to the width of the engaging end of the elbow, and these transverse cuts 35 are separated a distance corresponding to the length of the inlet end of the elbow and they are connected midway their ends by a longitudinal cut.

The lips *I, I*, thus produced, are bent upward, and when plate *K* is attached to the elbow, the rectangular end of the latter is placed between said lips *I, I*, and secured to the same by screws *J, J*, or other suitable means. The plate is then bent around exhaust pipe *A* and clamped thereto by clips consisting of metal bands *L, L*, and bolts *M, M*. The advantage derived from the use of the flexible metal plate *K* is that it can be used to attach the valve to any sized exhaust-pipe, and thus avoid the necessity of casting a different sized valve for each pipe. This feature of our invention is a very valuable one and enables us to standardize our improved valve and reduce the cost of its production.

We do not wish to be confined to the use of our improved cut-out valve in conjunction with automobile heaters, as it is obvious there are other uses to which it may be put, and we do not desire to be limited to the exact construction of the parts of our invention, as hereinbefore described and illustrated, as it is possible to substitute equivalents therefor that would answer practically as well.

What we claim as new is:—

1. A cut-out valve comprising a pipe having an opening therein, an elbow the inlet opening of which constitutes a valve-seat through which the bore of said elbow communicates with the bore of said pipe, a flexible plate of sheet metal having an opening therein the longitudinal edges of which are flanged upward and secured to the sides of the inlet end of said elbow, and annular clips for securing said plate to said pipe.

2. A cut-out valve comprising a pipe having a longitudinally elongated opening therein, an elbow the inlet opening of which constitutes a valve-seat and substantially corresponds in dimensions to said opening through which it communicates with the bore of said pipe, a valve having a transverse knuckle at its rear end and pivotally mounted in the rear end of said valve-seat between which latter and the rounded knuckle of said valve there is a transverse depression, a flexible plate of sheet metal connected to said inlet end and adapted to be bent to conform to the curvature of said pipe, and annular clips for securing said plate to said pipe.

3. A cut-out valve comprising a pipe having a longitudinally elongated opening therein, an elbow the inlet opening of which constitutes a valve-seat and substantially corresponds in dimensions to said opening through which it communicates with the bore of said pipe, a valve having a transverse knuckle at its rear end and pivotally mounted in the rear end of said valve-seat between which latter and the rounded knuckle of said valve there is a transverse depression, a flexible plate of sheet metal having an opening therein whose edges are flanged upward and secured to the sides of the inlet end of said elbow, and means for securing said plate to said pipe.

4. A cut-out valve comprising a pipe having a longitudinally elongated opening therein, an elbow the inlet opening of which constitutes a valve-seat and substantially corresponds in dimensions to said opening through which it communicates with the bore of said pipe, a valve having a transverse knuckle at its rear end and pivotally mounted in the rear end of said valve-seat between which latter and the rounded knuckle of said valve there is a transverse depression, a transverse shield formed in and made integral with the rear end of said valve-seat which arches over the inner portion of said knuckle, a flexible plate of sheet metal connected to said inlet end and adapted to be bent to conform to the curvature of said pipe, and clips for securing said plate to said pipe.

5. A cut-out valve comprising a pipe having a longitudinally elongated opening therein, an elbow the inlet opening of which

constitutes a countersunk valve seat through which said elbow communicates with said pipe, means for securing said elbow to said pipe, and a flat valve the inner surface of
5 which is substantially tangential to the circumference of the bore of the pipe, said valve having a transverse knuckle at its rear end the axis of which is substantially tangential to the outer circumference of said
10 pipe, the edges of said valve being adapted to fit into said countersunk seat and said valve having its rear edge rounded to form

a depression between the end and rear edge of said seat, and said knuckle having its upper segment enter a transverse groove adjacent and parallel with the rear of said seat. 15

In witness whereof we have hereunto set our hands and seals this 27th day of September, 1918.

THOMAS M. ROBERTS.
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Witnesses:

FRANK D. THOMASON,
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