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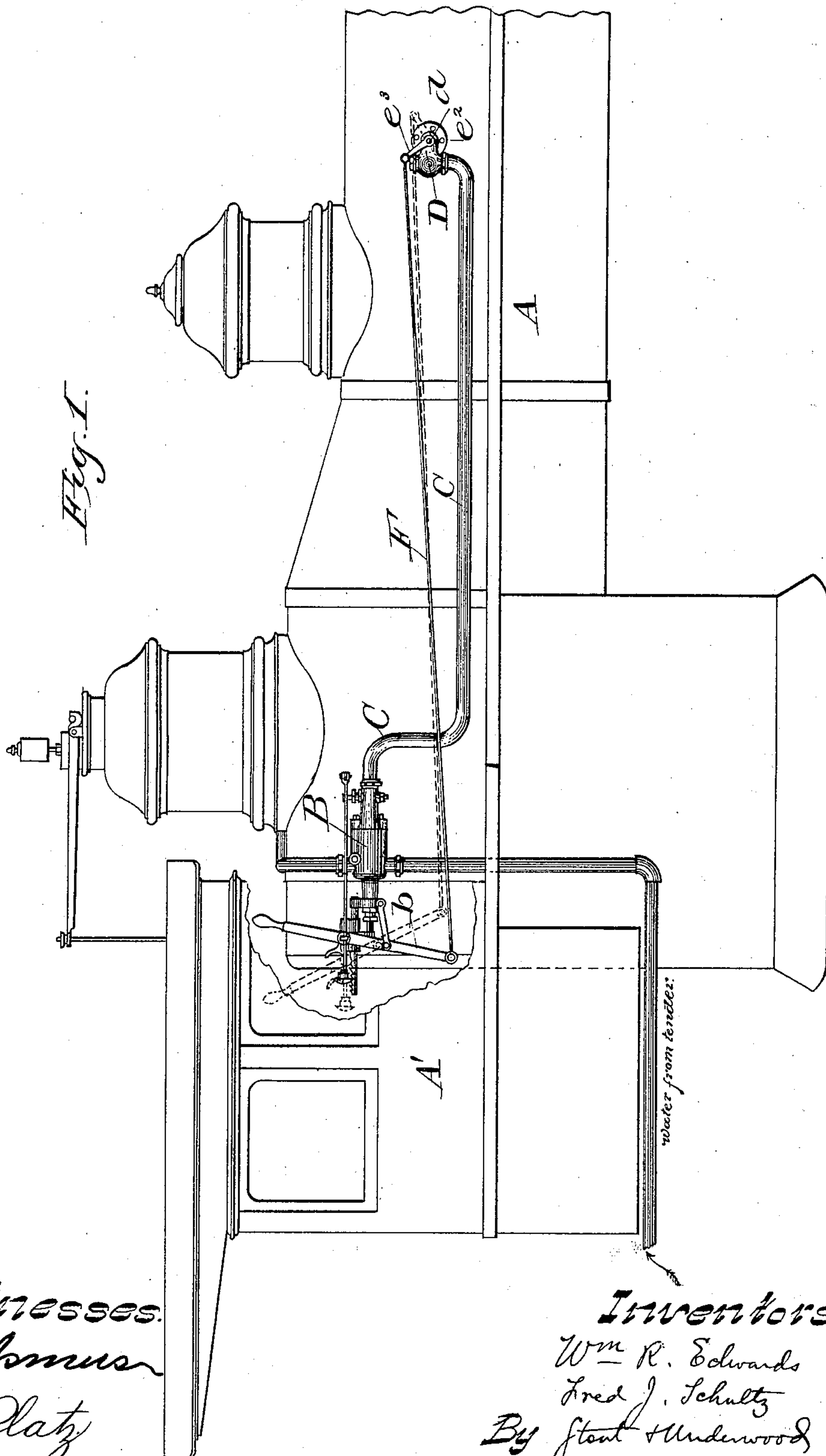
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W. R. EDWARDS & F. J. SCHULTZ.

VALVE FOR STEAM BOILERS.

No. 321,197.

Patented June 30, 1885.



Witnesses:  
*E. J. Ames*  
*R. Platz*

Inventors:  
*Wm R. Edwards*  
*Fred J. Schultz*  
By *Stout & Underwood*  
*Attorneys.*

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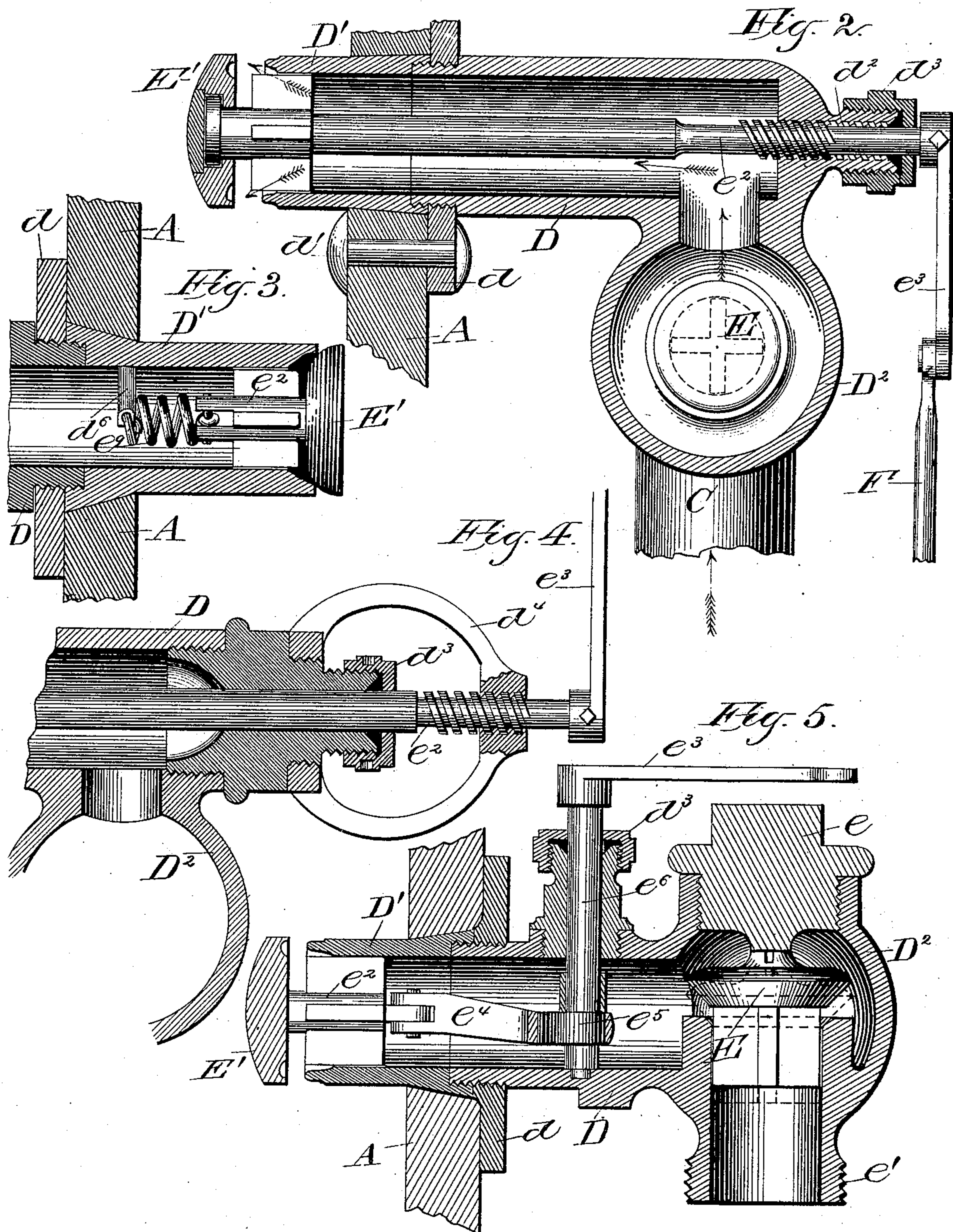
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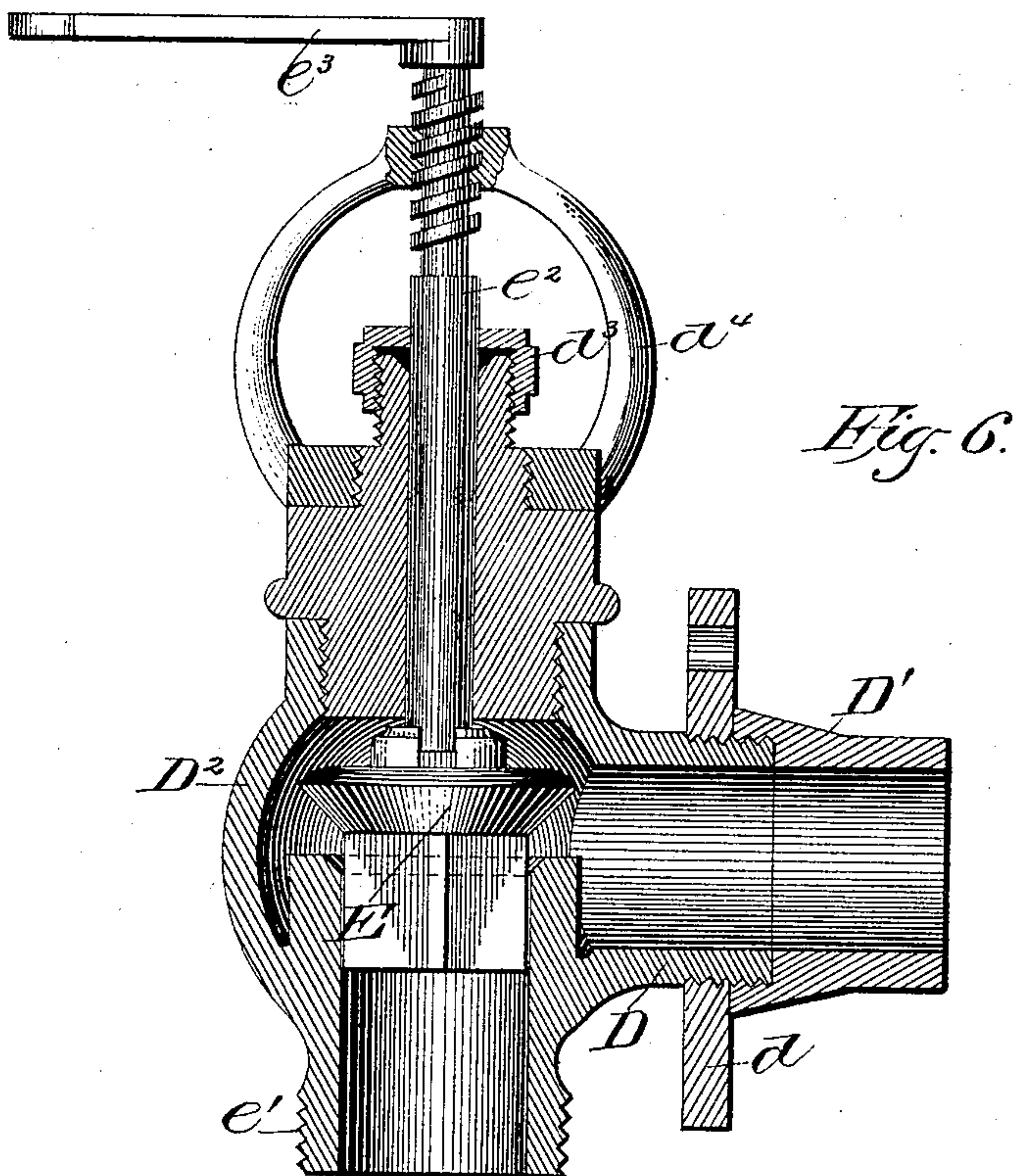
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W. R. EDWARDS & F. J. SCHULTZ.

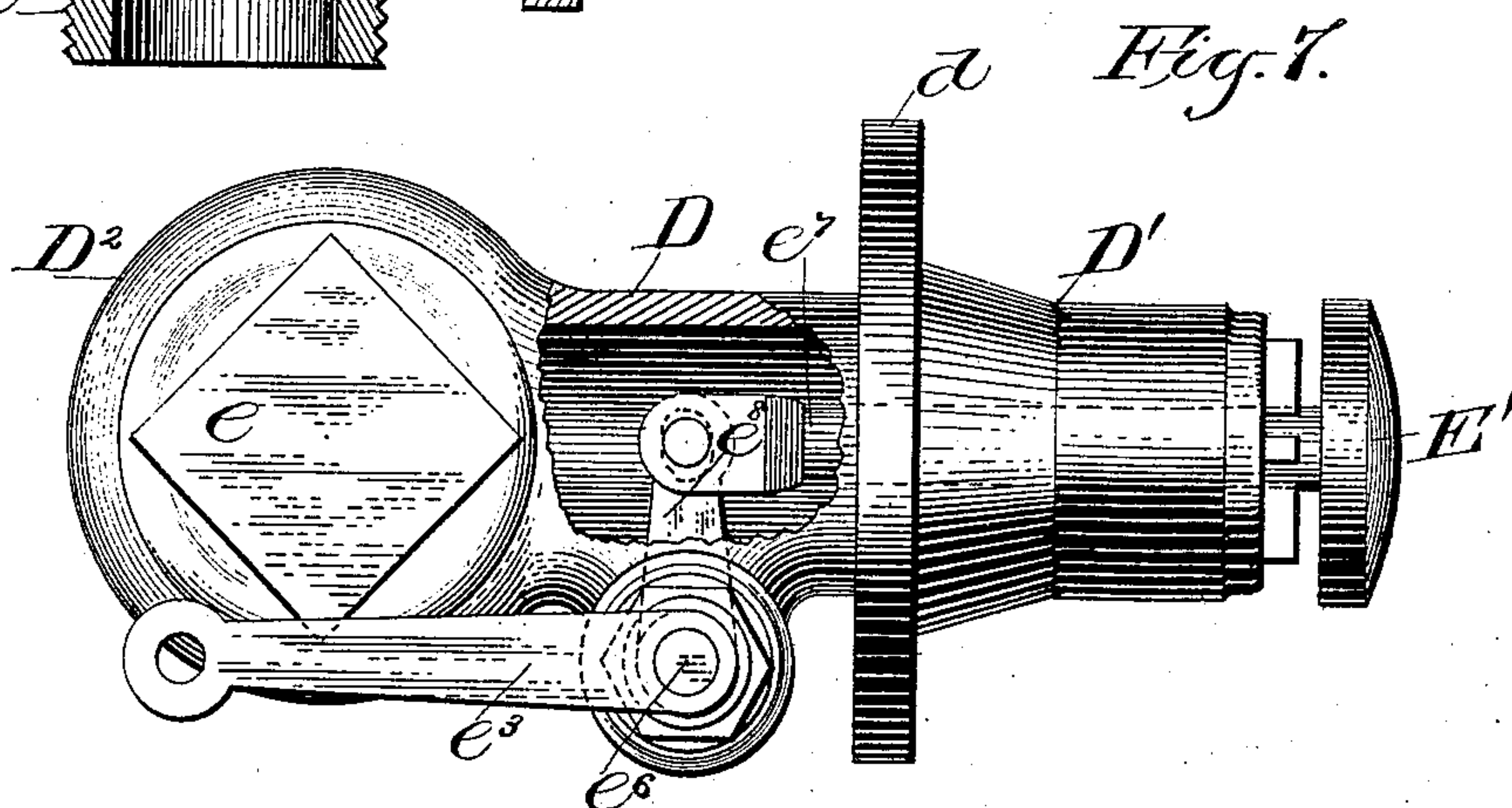
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*Fig. 6.*



*Fig. 7.*

*Witnesses:*

*E. G. Somers*

*R. Platz*

*Inventors:*

*Wm. R. Edwards*

*Fred J. Schultz*

*By J. H. Stout & Underwood*

*Attorneys.*



# UNITED STATES PATENT OFFICE.

WILLIAM R. EDWARDS AND FRED. J. SCHULTZ, OF MILWAUKEE, WIS.

## VALVE FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 321,197, dated June 30, 1885.

Application filed November 19, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, WM. R. EDWARDS and FRED. J. SCHULTZ, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Valves for Steam-Boilers; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to improvements in check-valves for steam-boiler injectors and pumps, and will be fully described hereinafter. In the drawings, Figure 1 is a broken elevation of a locomotive fitted with an injector check-valve embodying our invention. Fig. 2 is an enlarged sectional view showing one form of our device. Fig. 3 is a broken sectional view of our automatic double check-valve. Figs. 4, 5, and 7 are other forms in section and elevation of the check-valve shown in Fig. 2, and Fig. 6 illustrates the construction of our single check-valve.

The object of our invention is to provide a check-valve for the feed-pipe of steam-boiler injectors and pumps which will at all times be under the control of the engine-driver, and will also be of easy access whenever, by reason of accumulated sediment or scale, it becomes necessary to clean the valve. With valves as usually constructed, this cannot be done without taking the pressure from the boiler, thus causing delays and great inconvenience. In our improved device we have entirely obviated this defect by fitting on the orifice of the feed-pipe, inside the boiler, a valve-disk that is kept closed when the injector is not in operation and which is connected in such a manner to the operating-lever of the same as to be moved off its seat to admit water to the boiler. Whenever it becomes necessary to remove the accumulated scale or sediment from the ordinary valve, the cap of this latter is simply unscrewed, and the valve and its globe may be cleaned without blowing off steam. It happens sometimes, also, that this main or ordinary valve is held in balance by the back-pressure from the boiler. This pressure must be overcome before the injector will work. In our improved valve the back-pressure is overcome by closing the valve-disk on the orifice of the feed-pipe.

A is the boiler and A' is the locomotive-

cab. B is the injector, and C is the feed-pipe. D is the pipe-section that carries the check and stop valve E E'. This pipe-section is screw-threaded on its inner end to receive the flange *d* and the conical base of the nozzle D'. This latter is inserted in a suitable perforation of the boiler-shell, and is held in position by means of rivets or bolts, as at *d'* *d'*. The valve E is seated in the usual way within the globe D<sup>2</sup>, and *e* is its cap, opposite which the said globe has the screw-threaded joint *e'* to connect with the feed-pipe C.

In Fig. 2 we have shown the valve-disk E' with its stem *e*<sup>2</sup> projecting clear through the pipe-section D, which is provided at the rear with the stud *d*<sup>2</sup>, over which is fitted the stuffing-box *d*<sup>3</sup>. The inner face of the perforation made in the stud *d*<sup>2</sup> is screw-threaded to receive the screw-threaded portion of the stem *e*<sup>2</sup>, and the outer end of the said stem carries the crank *e*<sup>3</sup>, by means of which it can be turned to open or close the valve E'. This crank can be turned by hand, or it may be connected by the rod F to the actuating-lever *b* of the injector.

In Fig. 4 we have shown the stem of the valve with its screw-threaded portion working outside of the pipe-section D in the stirrup-shaped nut *d*<sup>4</sup> fitted thereon. This arrangement, which is preferably used, protects the screw-thread of the stem against the corrosive action of the steam.

In Figs. 5 and 7 are represented two modifications in the operating mechanism of the valve E'. In the former figure the stem *e*<sup>2</sup> is connected through a stirrup-link, *e*<sup>4</sup>, to an eccentric, *e*<sup>5</sup>, that is carried on the crank-shaft *e*<sup>6</sup>, which passes up through the pipe-section D and stuffing-box *d*<sup>3</sup>.

In Fig. 7 the connection between the stem of the valve is effected through the link *e*<sup>7</sup>, pivoting freely on end of the arm *e*<sup>8</sup> of the shaft *e*<sup>6</sup>.

In Fig. 3 we have shown the orifice-valve E' operated by means of a spring, *e*<sup>9</sup>, one end of which is fastened onto the stem *e*<sup>2</sup>, while the other end is attached to the pin *d*<sup>6</sup> projecting from the inner periphery of the nozzle D'.

As shown in Fig. 6, we may dispense with the valve E', and in this case we provide the valve E with a stem and crank, the same to

be operated in the manner described for the orifice-valve E'. It must be understood, also, that instead of connecting the rod F with the actuating-lever *b* of the injector we may simply provide it with a handle to be operated by hand, as desired.

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

10 1. The combination, with the feed or delivery pipe of a boiler injector or pump, of a check-valve, and a stop-valve within the boiler having its stem projecting out of the feed-pipe and provided with a crank to operate it positively, substantially as set forth.

15 2. The combination, with the feed or deliv-

ery pipe of a boiler injector or pump, of a stop-valve seated on the orifice of the said pipe inside the boiler, and provided with means within the boiler, and provided with an arm within the feed-pipe, and a lever upon the projecting shaft to operate it, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM R. EDWARDS.

FRED. J. SCHULTZ.

Witnesses:

S. S. STOUT,

H. J. FORSYTHE.