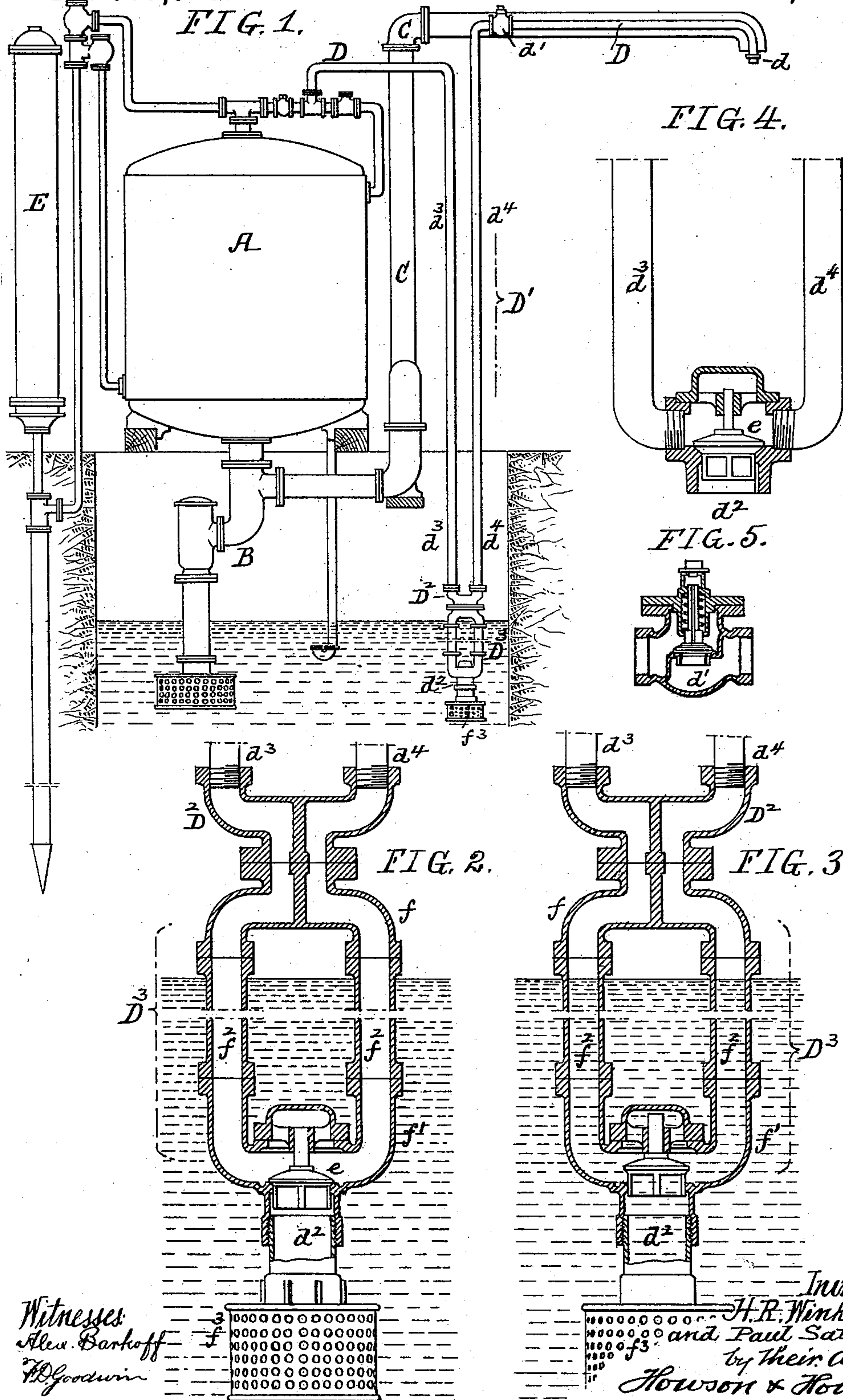


(No Model.)

H. R. WINKELMANN & P. SATTELKAU.
STEAM VACUUM WATER ELEVATOR.

No. 507,340.

Patented Oct. 24, 1893.



UNITED STATES PATENT OFFICE.

HERMAN R. WINKELMANN AND PAUL SATTELKAU, OF PHILADELPHIA,
PENNSYLVANIA.

STEAM VACUUM WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 507,340, dated October 24, 1893.

Application filed May 8, 1893. Serial No. 473,405. (No model.)

To all whom it may concern:

Be it known that we, HERMAN R. WINKELMANN and PAUL SATTELKAU, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Steam Vacuum Water-Elevators, of which the following is a specification.

The object of our invention is to automatically seal the steam supply pipe communicating with a steam vacuum water elevator by a water seal. This object we attain in the following manner reference being had to the accompanying drawings, in which—

Figure 1, is a side view of a steam vacuum water elevator used in the present instance for feeding the tenders of locomotives. Fig. 2, is an enlarged sectional view of the water seal loop, with the valve closed by pressure of steam. Fig. 3, is a similar view to Fig. 2, showing the valve opened by the pressure of water when the steam is cut off forming a water seal in the pipe. Fig. 4, is a view showing the loop simplified. Fig. 5 is a sectional view of the mechanical air check valve.

A is the vacuum tank; B the valved water inlet pipe extending into the well.

C is the valved discharge pipe communicating with the goose neck overhanging the railway track.

D is the steam inlet pipe having a portion d adapted to be coupled to a steam pipe on the locomotive or tender and communicating with the upper portion of the vacuum tank A.

E is the spray reservoir also communicating with the tank.

The steam pipe D ordinarily communicates directly with the vacuum chamber and has been provided with a mechanical air check valve d' , but we have found that this air check valve will leak in some instances when a partial vacuum is formed in the tank allowing air to enter the tank and break the vacuum, and it is to overcome this difficulty that the present invention was devised. We form a loop D' in the steam pipe D, the loop extending below a water level, preferably the water level of the well from which the water elevator draws its water, as shown in Fig. 1. In this loop below the water line is an opening d^2 . A valve e closes this opening when steam pressure is applied as in Fig. 2, but as soon

as the steam is cut off the valve will open as in Fig. 3, by the pressure of water and by a partial vacuum formed in the leg d^3 of the loop and also formed in the leg d^4 when the mechanical check valve d' is used. Thus the water will flow into the loop to or above the level of the water in the well preventing air entering the vacuum chamber through the steam pipe.

We preferably use the mechanical check valve in the position shown in Fig. 1, so that in the event of the water seal device becoming disabled the air check valve will prevent to a great extent the admission of air into the tank.

Fig. 4, illustrates the simplest arrangement of the loop, while Figs. 2 and 3, illustrate the form which we prefer to use. The pipes d^3, d^4 , are coupled to the casting D^2 . This casting is coupled to a structure D^3 formed of the heads f, f' and tubes f^2 . Within the head f' is the valve e and attached to the head is a screen f^3 for the incoming water. By this construction the base of the loop can be made entirely independent of the legs and these legs can be of any length desired without altering the construction of the base of the loop and when repairs are necessary the structure D^3 can be readily removed from the casting or coupling D^2 .

We claim as our invention—

1. The combination of a vacuum tank, the water inlet and outlet therefor, a steam inlet pipe adapted to be coupled to a steam generator, and a water seal device in said steam pipe, substantially as specified.

2. The combination of a vacuum water tank, the steam inlet pipe having a loop extending below a water level, an opening in the base of said loop, and a valve for said opening which will close on the passage of steam through the pipe, and will open when steam is cut off and allow water to flow into the loop, thereby making a water seal for the pipe, and preventing the admission of air to the tank through the pipe, substantially as described.

3. The combination of a vacuum water tank, the steam inlet pipe having a loop extending below a water level, an opening in the base of said loop, a valve for said opening, which will allow water to flow by gravity into the loop

when steam is cut off which will close against the pressure of air, but will open when steam passes through the pipe, substantially as described.

5 4. The combination of the vacuum water tank, the steam inlet pipe having a loop extending below the water level of the well, and a valved opening in said loop to allow water to flow into the loop and make an air seal,
10 when steam is cut off, substantially as described.

5 5. The combination of the vacuum tank, the steam inlet pipe extending from the tank, a tubular section coupled to the end of said
15 pipe, a steam pipe connected to the inlet open-

ing of said section, the said tubular section having two passages therein connected with a cross passage at the base, an opening in said cross passage, and a valve adapted to close said opening when steam is introduced into 20 the pipe, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HERMAN R. WINKELMANN.
PAUL SATTELKAU.

Witnesses:

WILLIAM A. BARR,
JOSEPH H. KLEIN.