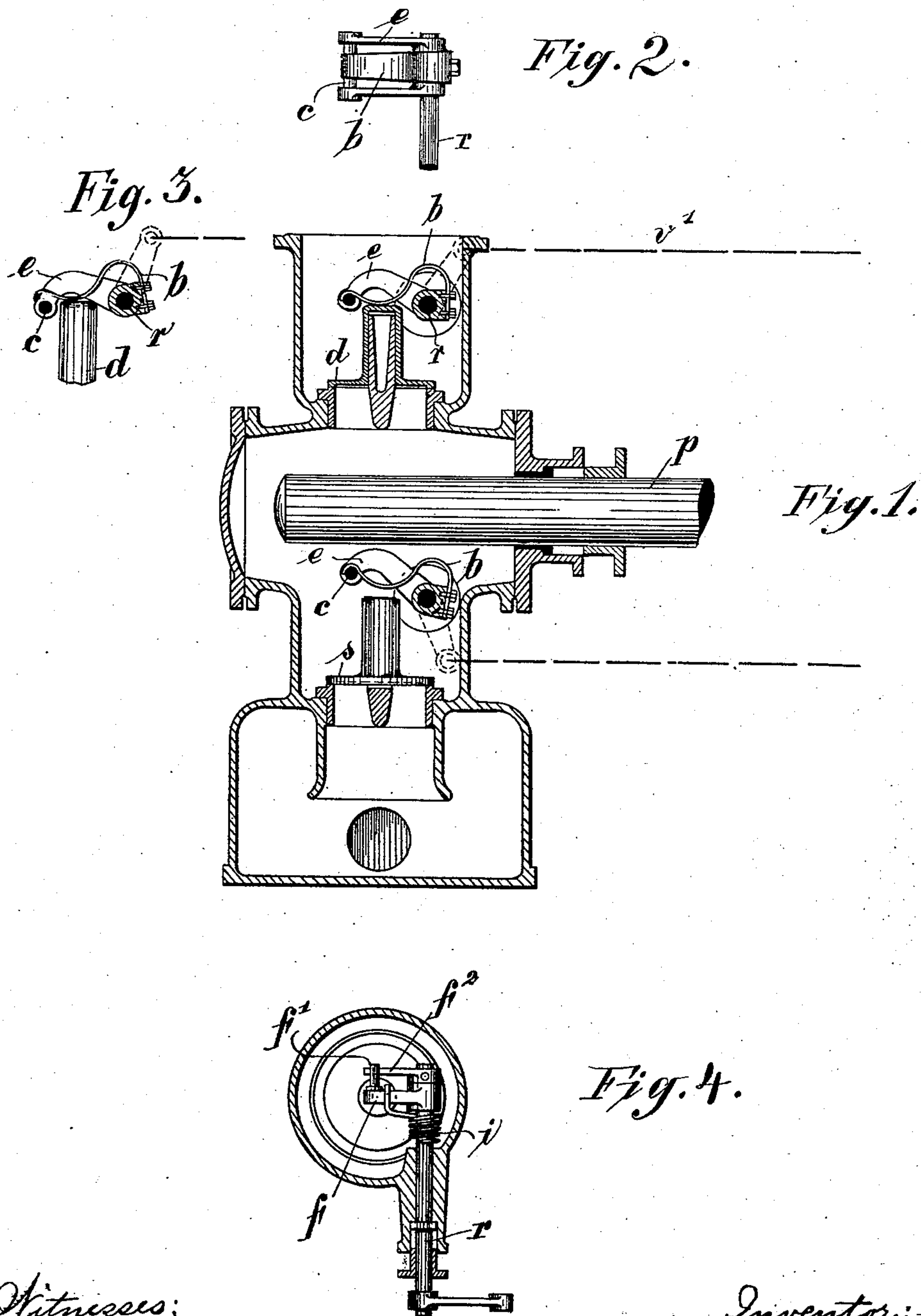


(No Model.)

A. RIEDLER.
VALVE GEAR.

No. 572,720.

Patented Dec. 8, 1896.



Witnesses:
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Atty.

UNITED STATES PATENT OFFICE.

ALOIS RIEDLER, OF BERLIN, GERMANY.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 572,720, dated December 8, 1896.

Application filed January 26, 1895. Serial No. 536,345. (No model.) Patented in Germany March 20, 1891, No. 60,447, and March 27, 1892, No. 64,772, and in England March 26, 1891, No. 5,429.

To all whom it may concern:

Be it known that I, ALOIS RIEDLER, a subject of the King of Prussia, German Emperor, residing at Berlin, Germany, have invented certain new and useful Improvements in Valve-Gears, (for which I have received patents in Germany, No. 60,447, dated March 20, 1891, and No. 64,772, dated March 27, 1892, and in Great Britain, No. 5,429, dated March 26, 1891,) of which the following is a specification.

The present invention relates to a valve-gear for pumps, blowers, and the like, and is designed to be employed in connection with valves which open automatically under the pressure or suction in the cylinder, but which are positively closed by the valve-gearing.

The invention consists in imparting to the valve-operating mechanism an elastic or yielding quality which enables a continued movement of the valve-operating device during the operative stroke of such device after the motion of the valve itself has ceased, indifferently as to whether the stoppage of the valve is due to its having properly closed into its seating or to any irregular interruption of its motion. It will thus be evident that by means of the present device a breakdown of the valve-gearing, owing to a premature stoppage of the valve motion from any cause whatever, will be entirely avoided, since the valve-gearing can perform its full stroke independently of the motion of the valve; and in order to make the present invention more easily intelligible reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figure 1 is a vertical section through the cylinder and pressure and suction valves of a pump; Fig. 2, a plan view of the valve-operating lever as shown in elevation in connection with the pressure-valve of the pump illustrated in Fig. 1, Fig. 3 being a side elevation of the valve-operating lever similar as in Fig. 1, but the gear having continued its motion while the lever is arrested on the valve. Fig. 4 is a detail plan view of a modified form of valve-operating mechanism.

Referring to Fig. 1, *s* is the suction-valve, *d* the pressure-valve, and *p* the plunger, of a

pump. The pressure-valve *d* is operated by the closing-lever *b*, made as a flat spring, having its end fixed to lever-arms *e e*, keyed to the pivot-spindle *r*, operated by a reciprocating rod *v'* and its opposite end resting on a pin *c*, connecting the free ends of the levers *e e*. The spring *b* must be set to such pressure as will enable it to close the valve at ordinary resistance without rising from the pin *c*. This is necessary to prevent any pressure being exerted on the valve at the inoperative stroke of the levers *e e*. Thus when the valve motion ceases from any cause whatever, the motion of the valve-gearing may continue to the end of its stroke, the pin *c* being free to move downwardly independently of the spring *b*, while the latter is arrested on the valve, as shown in Fig. 3.

For the suction-valve *s*, Fig. 1, the gearing is shown removed from the valve.

It is not necessary that the spring *b* forms the valve-closing lever itself. The spring may also be inserted at any point of the valve-gearing, so that it is not in direct contact with the valve. Such modification is shown in Fig. 4, where instead of a flat spring a spiral *i* is employed, having one end fast on the spindle *r* and the free end resting on an arm *f*, loosely mounted on the said spindle *r* and having a horizontally-projecting pin *f'* at its free end engaging a lever *f''*, keyed to the spindle *r*. The operation of this form of the invention will be obvious from the drawings. On the stoppage of the valve the valve-operating gear may continue its motion, twisting the spiral spring *i*, the arm *f* remaining lodged against the valve.

I claim as my invention—

1. In a pump, the combination with a valve, of a valve-gear disconnected from the valve, thus permitting the valve to open automatically when the gear is lifted from the valve, said gear comprising a spindle and a lever secured to the spindle, and a positively-operated spring-controlled valve-closing arm connected to the spindle and adapted to be relieved from positive contact with the valve at or prior to its opening, and to contact with and bear on the valve before or at the closing of the latter while the valve-gear continues its movement through its operative stroke

and after the closing movement of the valve has ceased, substantially as set forth.

2. The combination in a valve-gear for pumps of a valve not connected to said gear, 5 which latter after being removed from the valve leaves it free to open automatically with a positively-operated valve-closing arm, said arm being formed by a spring, one end of this spring being connected with the gear 10 and the other end being loose, so that this loose end separates from the gear when the valve is stopped and the gear continues its movement, substantially as set forth.

3. The combination in a valve-gear for 15 pumps of a valve not connected to said gear, which latter after being removed from the

valve leaves it free to open automatically, with a positively-operated valve-closing arm, one end of the arm being connected with the gear, the other end under the influence of a 20 spring, which allows said end of the arm to separate from the gear when the valve is stopped and the gear continues its movement, substantially as set forth.

In testimony whereof I have signed my 25 name to this specification in the presence of two subscribing witnesses.

ALOIS RIEDLER.

Witnesses:

CHAS. KRÜGER,
WM. HAUPT.