

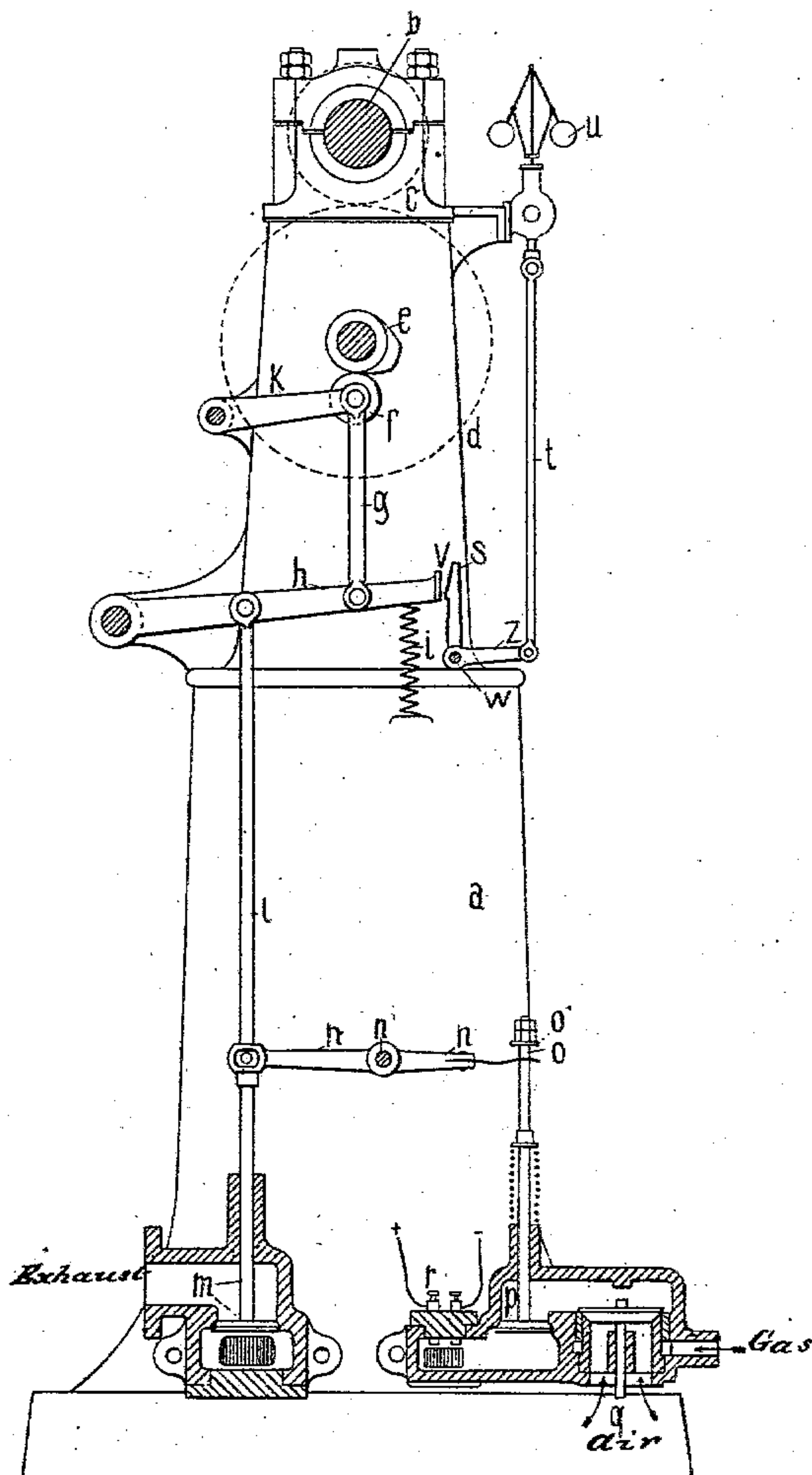
(No Model.)

E. KÖRTING.

GAS MOTOR.

No. 366,116.

Patented July 5, 1887.



Attest.  
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# UNITED STATES PATENT OFFICE.

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## GAS-MOTOR.

SPECIFICATION forming part of Letters Patent No. 366,116, dated July 5, 1887.

Application filed April 16, 1887. Serial No. 235,092. (No model.)

*To all whom it may concern:*

Be it known that I, ERNST KÖRTING, a subject of the King of Prussia, residing at Hanover, in the Kingdom of Prussia, Germany, have invented new and useful Improvements in Gas-Motors, whereof the following is a specification.

My invention relates to gas-motors in which, when the speed is too great, the governor operates to keep open the exhaust-port, so that the piston then pushes the combustion-gases from the cylinder into the exhaust-pipe and draws them back again without sucking in combustible gas mixture.

The first improvement consists in means for establishing a connection between the exhaust-valve and the induction-valve for combustible gas mixture, whereby when the exhaust-valve is open the induction-valve will be kept closed, in view of preventing an entrance of gas mixture into the cylinder, whereas when the exhaust-valve is closed the operation of the induction-valve is unimpeded.

The second improvement consists in the means employed, in combination with the governor, for keeping open the exhaust-valve when the speed of the engine is above the normal.

On the annexed sheet of drawings is represented the frame of a gas-engine having attached to it the valve-operating mechanism involving my improvements, the valve-boxes being shown in section.

*a* is the portion of the frame containing the power-cylinder; *b*, the crank-shaft.

*c* *d* are the gear-wheels for driving the shaft carrying the tappet *e*.

*g* is a valve by means of which gas and air are mixed in determinate proportion; *p*, the valve for the admission of gas mixture into the cylinder, the said valve being provided with a spring for closing the same, but for the rest operating automatically; *m*, the exhaust-valve, which is opened by the tappet *e* and intermediate parts and closed by a spring; and *v*, an electric igniting device. The said intermediate parts (shown by the drawing) consist in the roller *f*, carried by a guiding-arm, *k*, the lever *h*, to which is connected the rod *l* of the exhaust-valve *m*, the spring *i*, acting from below against the lever *h*, and the rod *g*, connecting together the arm *k* and the lever *h*.

For establishing the aforesaid connection between the exhaust-valve *m* and the induction-valve *p* a double-armed lever, *n*, is inserted between the respective rods or stems *l* and *o* of the said valves, so that the lever will press the valve *p* against its seat when the valve *m* is completely open, but that it will not impede the motion of the valve *p* when the valve *m* is closed. According to the drawing, the lever, having its fulcrum at *n'*, is pivoted with one end to the rod *l*, so as to be positively oscillated thereby, whereas with its other end, which is forked, it projects under the collar *o'* of the rod *o*, there being so much play between this end of the lever and the collar *o'* that when the valve *m* is closed the lever allows the rod *o* to move, while when the valve *m* is fully open the lever bears against the collar *o'* and keeps the rod in its uppermost position. In order to avoid undue strains, the connection between the parts in question is preferably made resilient—for instance, in forming the end of the lever *n* operating upon the rod *o* by a spring, as shown in the drawings.

The means for keeping open the exhaust-valve whenever and as long as the engine runs too fast consists in a pawl, *s*, having its fulcrum at *w*, and connected by an arm, *z*, and a rod, *t*, to the governor *u*, and of an edge or projection formed upon any suitable part of the valve operating mechanism and adapted to be engaged in its lowest position by the pawl *s*. Thus in the mechanism represented by the drawing the said edge (marked by the letter *v*) is formed upon the end of the lever *h*, and the pawl *s* is made in shape of a hook capable of catching over the edge *v*. The pawl is so arranged relatively to the governor that when the engine makes the normal or a lower number of revolutions the pawl is outside of the path of the edge *v*, whereas when the normal number of revolutions is exceeded it will come into the said path. In the first case the lever *h*, after having been depressed by means of the tappet *e*, is free to yield to the pressure of the spring *i*, acting thereon from below. The exhaust-valve is therefore opened and closed in uniform intervals, and the induction-valve can play freely when the valve *m* is closed. A regular aspiration of full charges of combustible gas mixture by the piston con-



sequently then takes place and the engine develops its maximum power. In the second case (when the pawl extends into the path of the edge *v*) the edge, as soon as it is brought into its lowest position by the operation of the tappet *e*, is caught by the pawl and maintained in this position, the valve *m* being thereby kept open, while at the same time the valve *p* is kept closed by the lever *n*, so that the piston can then only push the combustion-gases to and fro without being capable of drawing in combustible gas mixture by the valve *p*. Considering that the spring *i* presses the edge *r* firmly against the hook of the pawl *s* during the time the tappet *e* does not act upon the roller *f*, and that the energy of the governor is not sufficient to overcome the friction existing under these conditions between the edge and the pawl, a disengagement of the latter from the former only takes place at the time the tappet has depressed the edge *v*.  
I claim as my invention—

1. In a gas-motor, the combination, with the exhaust-valve *m*, having the rod *l*, means for operating the said valve, and the self-acting induction-valve *p*, having the rod *o*, of the lever *n*, connecting together the rods *l* and *o*, substantially as and for the purpose described.  
2. The combination, with the exhaust-valve *m*, rotating tappet *e*, an intermediate part or parts for transmitting motion from the tappet *e* to the valve *m*, and having an edge or projection, *v*, spring *i*, and governor *n*, of the pawl *s*, capable of engaging with the said edge or projection, and means of connection between the pawl and the governor, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ERNST KÖRTING.

Witnesses:

F. DE BEER,  
JOH. KRACKE.