

(No Model.)

O. VOGELSANG.

VALVE GEAR FOR GAS ENGINES OR PETROLEUM ENGINES.

No. 438,785.

Patented Oct. 21, 1890.

Fig. 4.

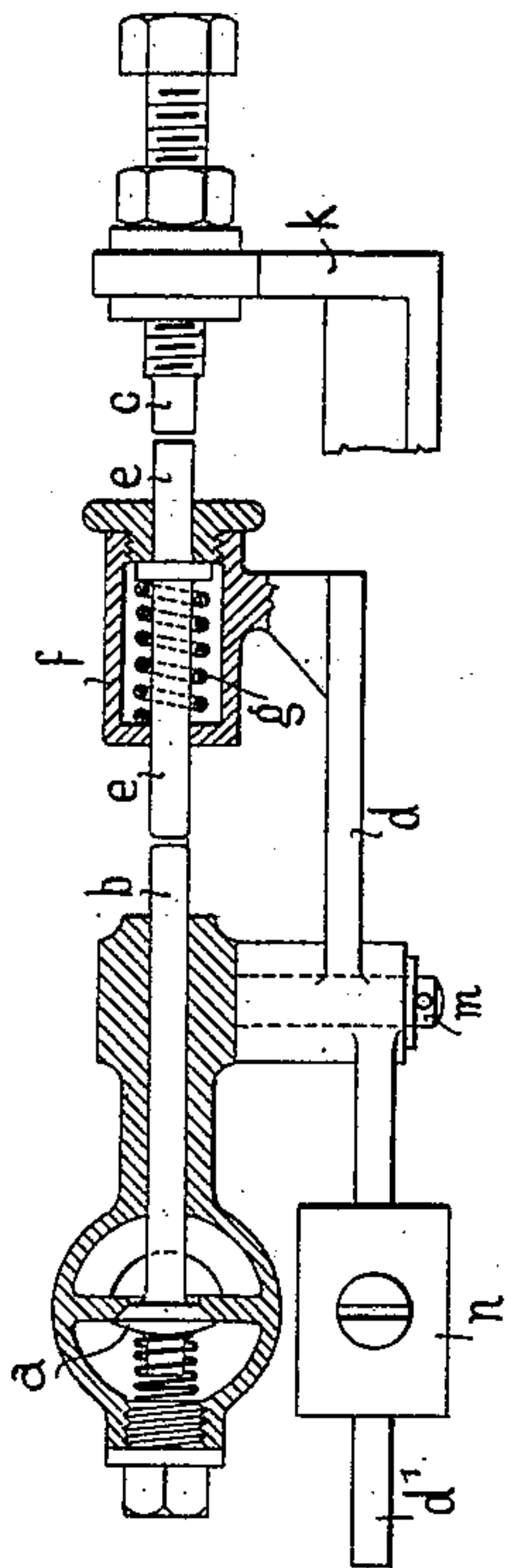


Fig. 5.

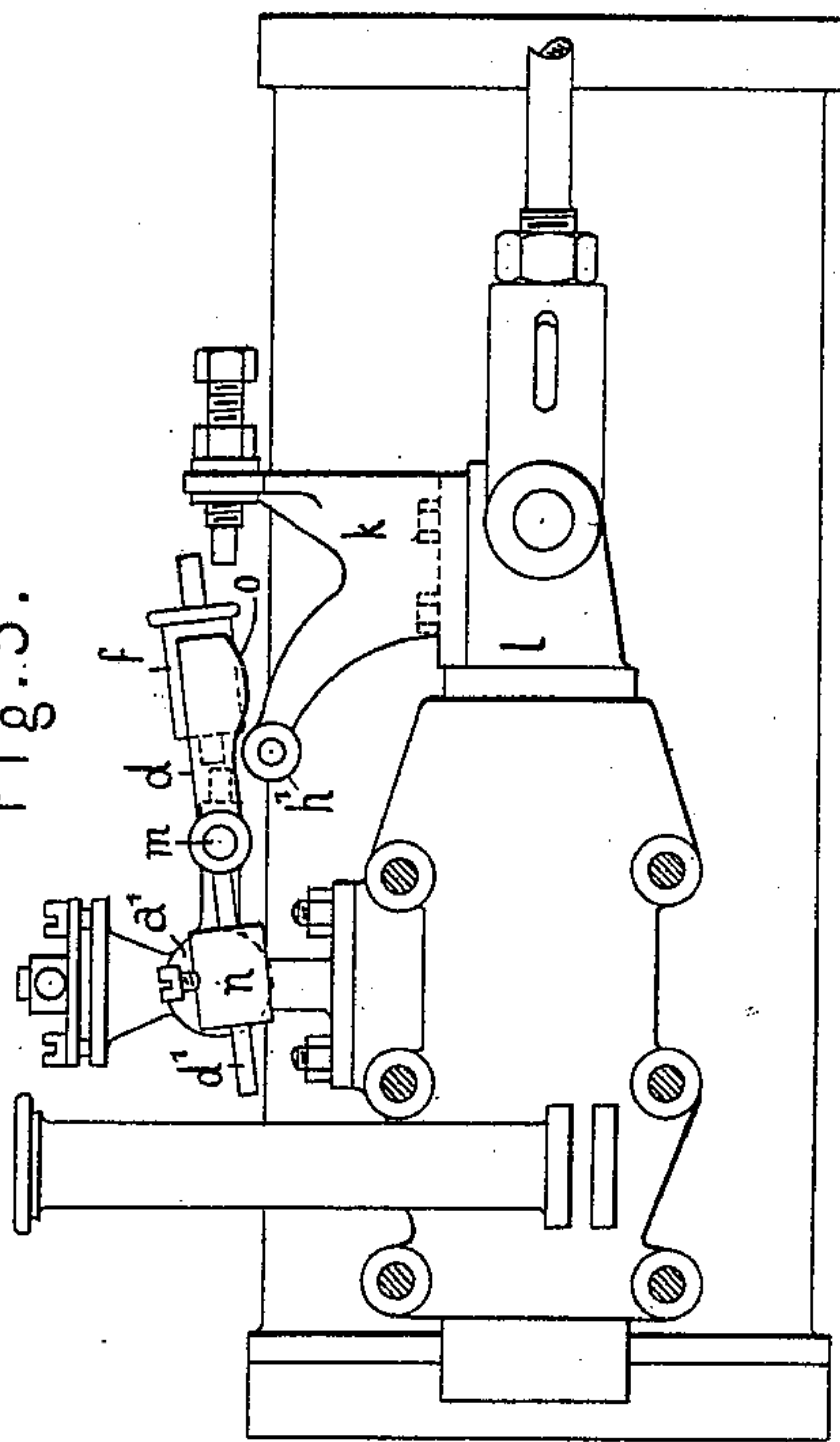


Fig. 6.

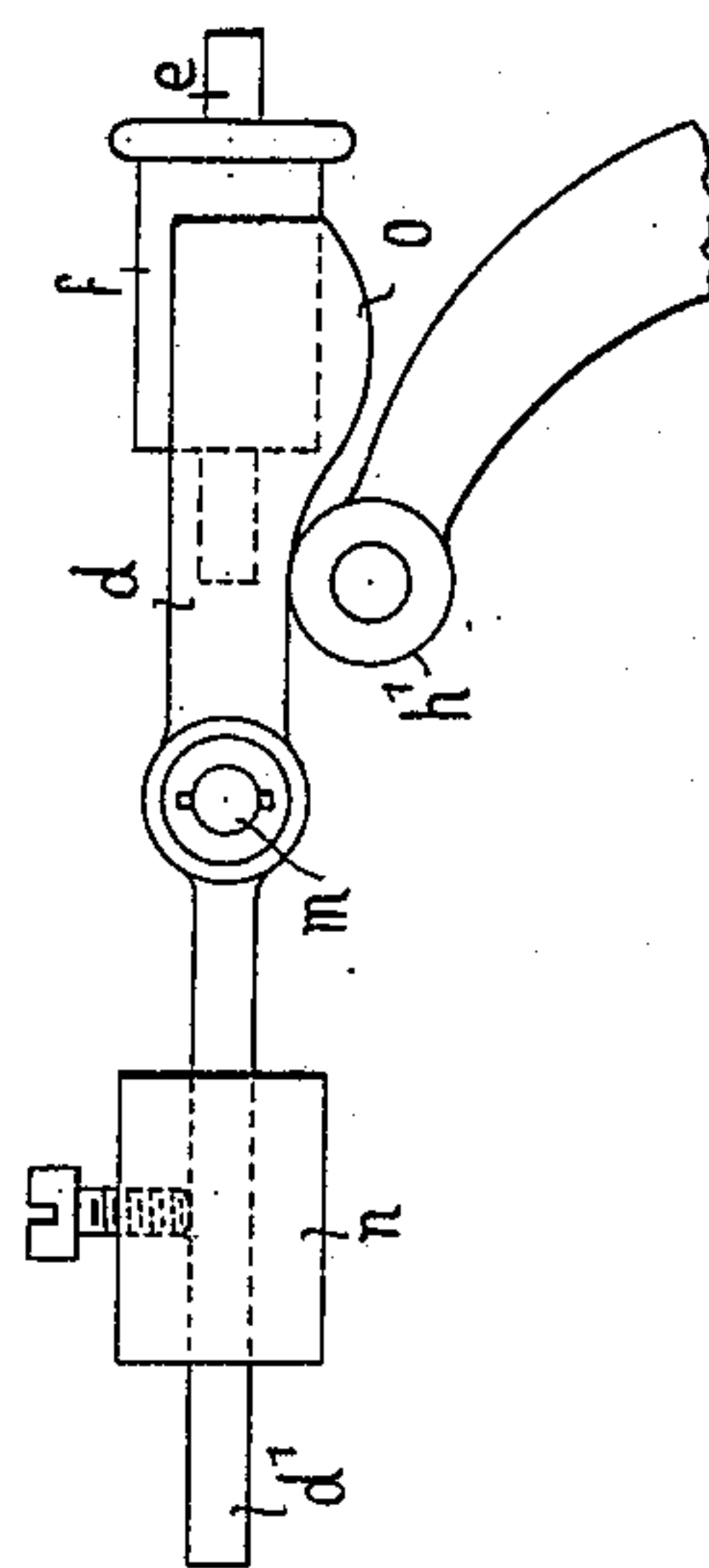


Fig. 1.

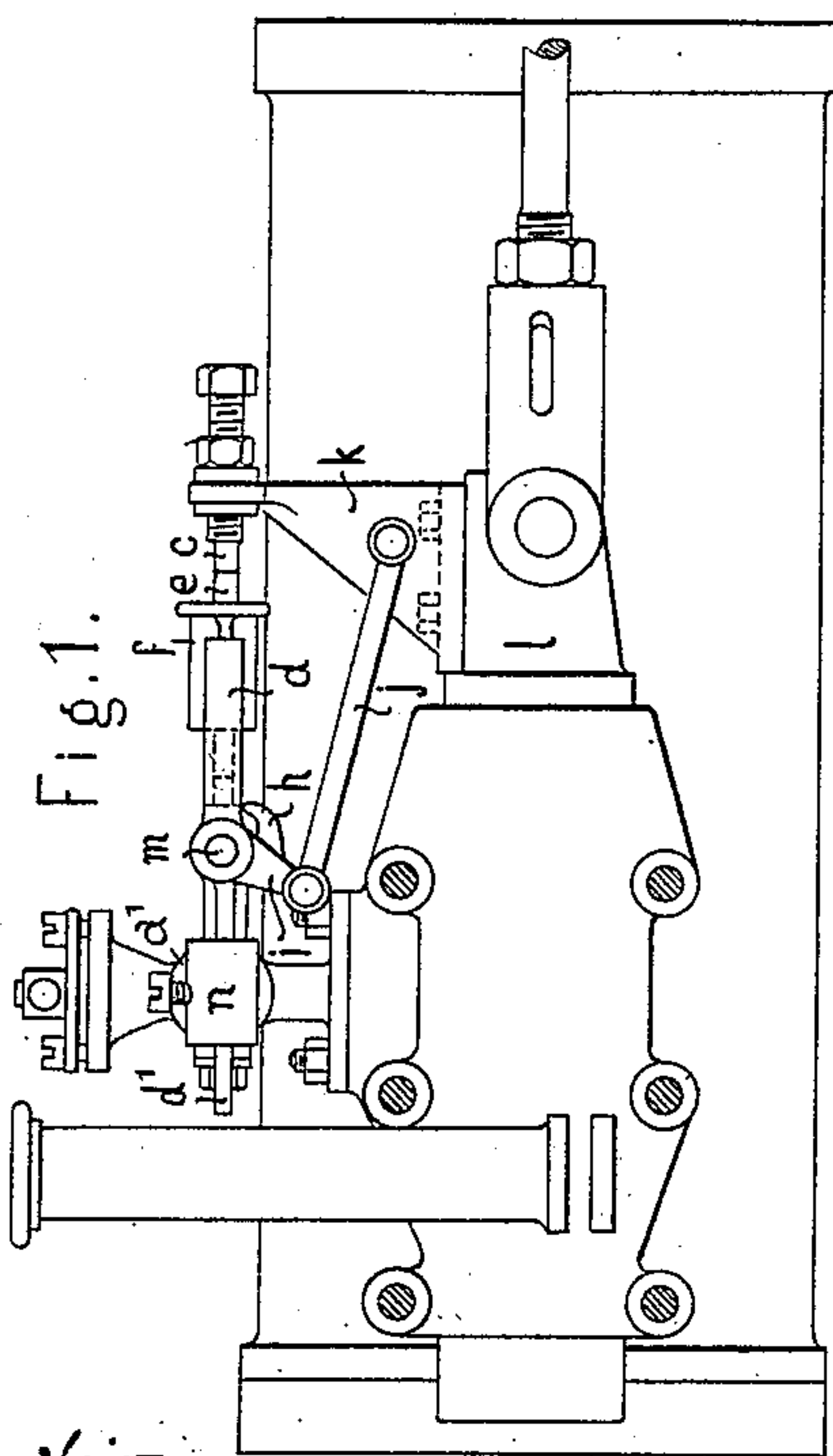


Fig. 2.

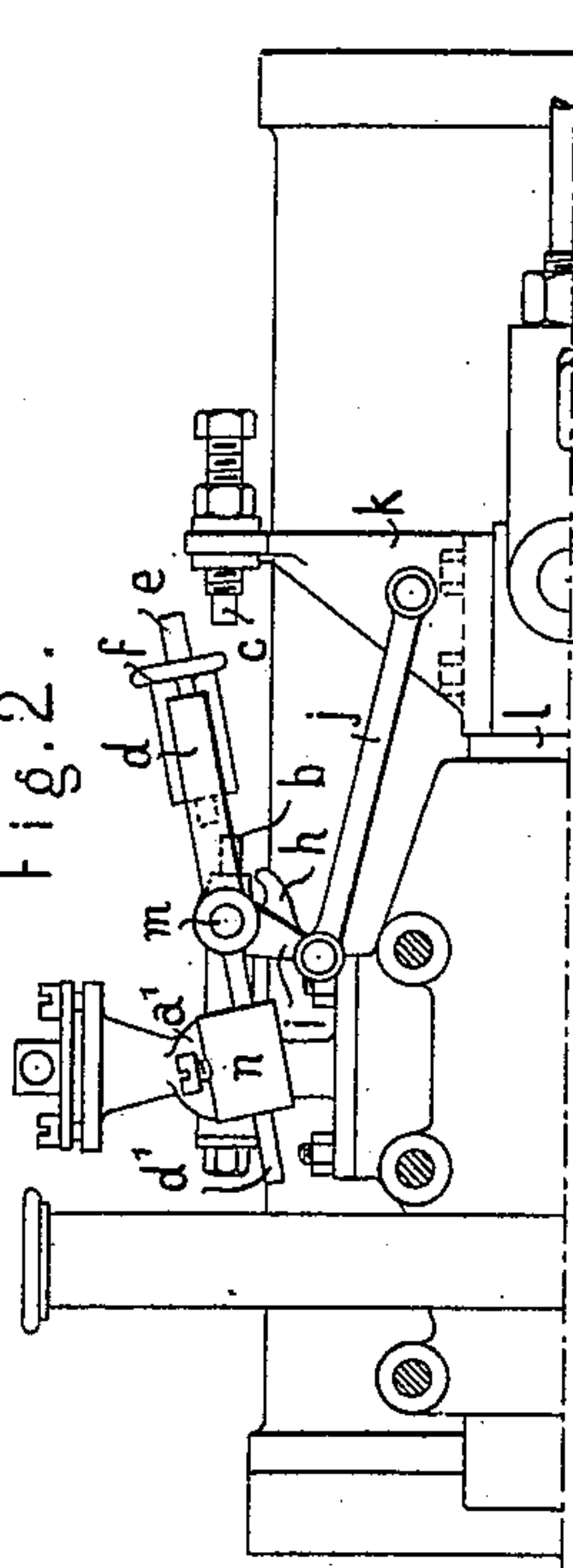
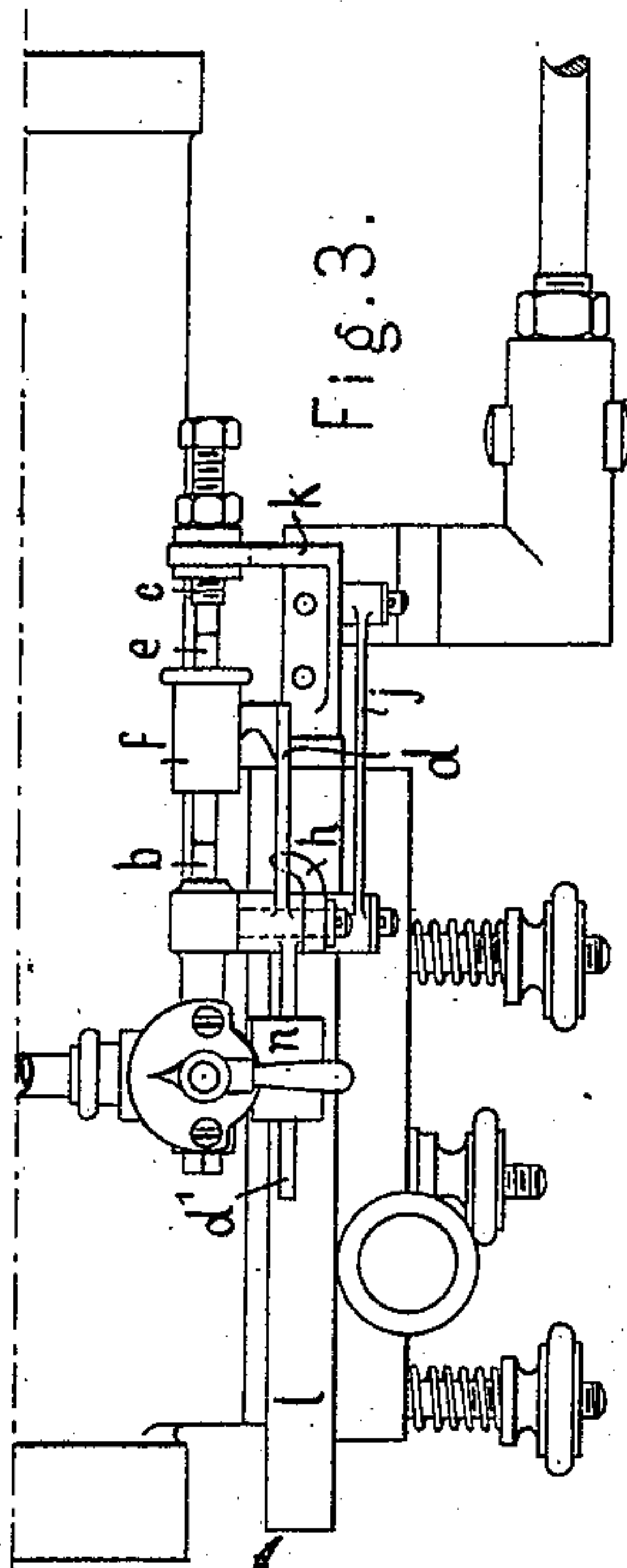


Fig. 3.



Witnesses:
Rafel L. Hogue
Edwin Cuse.

Inventor
Otto Vogelsang
by Pollock Mauro
his attorneys.

UNITED STATES PATENT OFFICE.

OTTO VOGELSANG, OF PLANEN, NEAR DRESDEN, SAXONY, ASSIGNOR TO
MORITZ HILLE, OF DRESDEN, GERMANY.

VALVE-GEAR FOR GAS-ENGINES OR PETROLEUM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 438,785, dated October 21, 1890.

Application filed July 30, 1890. Serial No. 360,395. (No model.)

To all whom it may concern:

Be it known that I, OTTO VOGELSANG, a subject of the King of Saxony, residing at Planen, near Dresden, in the Kingdom of Saxony, Germany, have invented a new and useful Improvement in the Valve-Gear of Gas-Engines or Petroleum-Engines, whereof the following is a specification.

My invention relates to the valve-gear of engines driven by the explosive combustion of mixtures of air and lighting gas or vapors of hydrocarbons; and the improvement consists in the combination, with the admission-valve for gas or vapor, of a suitably-balanced lever oscillated in one direction by the engine and in the other by gravity, and through the medium whereof the operation of the admission-valve is so controlled that the latter will be opened at every stroke of the slide-valve or not, according as the engine runs at the ordinary or at an excessive speed.

The mechanism is constructed as follows: Opposite to the stem of the admission-valve and at some distance therefrom is arranged a reciprocating finger, moving in a line with the said stem and synchronously with the slide-valve. By the side of these parts is placed a lever capable of oscillating by gravity and carrying a movable pin controlled by a spring, the lever and the pin being so disposed that when the lever is in a certain position, which I shall call its "operative position," the pin will be lengthwise between the stem of the admission-valve and the reciprocating finger. The pin has such length that under the said conditions the finger on advancing will press the pin against the valve-stem, and thus open the valve, the pin being pushed backward again by its spring when the finger recedes. At one side of the said lever there is an oscillating or reciprocating tappet, which at every stroke of the slide-valve acts on the lever to oscillate the same, so as to throw the pin out of line with the admission-valve stem and the reciprocating finger. The lever is, however, balanced in such manner that when the engine runs at the proper speed the lever, after having been swung out of its operative position, will return thereto just in time to be again acted upon by the recip-

rocating finger at its next forward stroke. The admission-valve is in this case opened at every stroke of the slide-valve; but if the speed of the engine is too great the lever on oscillating backward will be too late for the pin to be engaged by the reciprocating finger. The admission-valve will consequently then remain closed and the cylinder will not receive any charge of explosive mixture. This skipping of charges continues until the engine has reassumed its normal speed, whereupon the admission-valve is opened again regularly.

In the annexed drawings, Figure 1 is the front elevation of a gas-engine cylinder with my improved regulating device attached thereto, the aforesaid lever being in operative position. Fig. 2 is a like view showing the lever in different position. Fig. 3 is a plan corresponding to Fig. 1. Fig. 4 is a sectional plan of the lever and other parts drawn to a larger scale. Fig. 5 is a front view of the device, with different arrangement of the means for oscillating the lever. Fig. 6 is an enlarged front view of the lever belonging thereto.

In Figs. 1 to 4, *a* is the admission-valve for gas or vapor in box *a'*. *b* is the stem of the said valve. *c* is the reciprocating finger, which is fixed in a bracket *k*, secured to the slide-valve *l*. *d* is the oscillating lever, turning on a horizontal pivot *m*. *e* is the pin through which the finger *c* operates on the valve-stem *b*, the pin being mounted and arranged to slide in a sleeve *f*, integral with the lever *d*. *g* is a spring inclosed in the sleeve *f* and acting against a collar on the pin *e*, so as to keep the latter pressed with its collar outwardly against a shoulder disposed inside of the sleeve. *h* is the tappet, through the medium whereof the lever *d* is oscillated by the engine, the said tappet forming an arm of the lever *i*, turning on the same pivot as the lever *d*, and connected by the rod *j* to the bracket *k*. *n* is a counter-poise placed on an arm *d'* of the lever *d*, and whereby the weight of the sleeve *f* is so balanced that the lever will perform its return oscillation in the required time.

If the engine is running at the normal speed and the slide-valve *l* is at the end of its in-

ward stroke, the parts will be in the position shown by Fig. 1, the pin *e* being then in a line with and engaged between the finger *c* and the valve-stem *b*, and the finger having acted through the pin on the stem. When the slide-valve thereupon moves to the right relatively to the drawings, the tappet *h*, acting from below against the lever *d*, swings the same upward and puts the pin *e* out of line with the finger *c*. At the next inward stroke of the slide-valve the tappet *h*, receding, allows the lever *d* to drop, and provided the lever be properly balanced it will closely follow the tappet, so that the pin *e* is re-engaged by the finger *c* as soon as it has come into a line therewith. The tappet being then at or near the end of its downward oscillation also serves to prevent the lever *d* from dropping below its operative position. If, on the other hand, the speed of the engine is above the normal, the lever *d* will remain behind relatively to the motion of the tappet *h*, and it will be too late to be engaged by the finger *c*. The finger will consequently pass under the pin *e*, as shown by Fig. 2, and no action on the valve-stem will take place.

According to Figs. 5 and 6 the means for oscillating the lever *d* upward consist in the cam-surface *o*, formed on the under side of the lever, and the reciprocating tappet *h'*, integral with the bracket *k*, the cam-surface being so arranged that when the slide-valve *l* begins to move outward the tappet *h'* will push against the said surface and swing the lever upward, while when the slide-valve is at the end of its inward stroke the lever rests on the tappet. For the rest the mechanism does not differ from the one represented by Figs. 1 to 3.

I claim as my invention—

1. The combination, with the admission-valve of a gas or petroleum engine, of a valve-gear comprising a reciprocating finger in line with the valve-stem, an oscillating lever, a

spring-controlled pin carried by said lever and adapted to transmit motion from said finger to said valve-stem, and means for tilting said lever at each stroke of the finger, said lever being free to return to its normal position by gravity in time to actuate said valve-stem when the engine is running at normal speed, whereby the regulation of the engine is effected, substantially as described.

2. The combination of the slide-valve *l*, the admission-valve *a*, having the stem *b* parallel to the motion of the slide-valve, the finger *c* fixed to the slide-valve in a line with the stem *b*, the lever *d*, capable of oscillating by gravity and having the sleeve *f*, the pin *e*, mounted in said sleeve and adapted to engage between the valve-stem *b* and the finger *c*, the spring *g*, controlling the pin *e*, and a tappet actuated by the slide-valve and whereby the lever *d* and the pin *e* are oscillated to throw the pin out of line with the finger *c* at the time the valve moves outward, substantially as specified.

3. The combination of the slide-valve *l*, the admission-valve *a*, having the stem *b* parallel to the motion of the slide-valve, the finger *c*, fixed to the slide-valve in a line with the stem *b*, the lever *d*, turning on a horizontal pivot *m* and having the sleeve *f*, and an arm *d'*, with the adjustable counterpoise *n*, the pin *e*, mounted in the said sleeve and adapted to engage between the valve-stem *b* and the finger *c*, the spring *g*, controlling the pin *e*, the lever *i*, having the tappet *h*, adapted to act from the side against the lever *d*, and the rod *j*, connecting the lever *i* with the slide-valve, substantially as described.

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

OTTO VOGELSANG.

Witnesses:

MORITZ HILLE,
BRUND GORTES.