

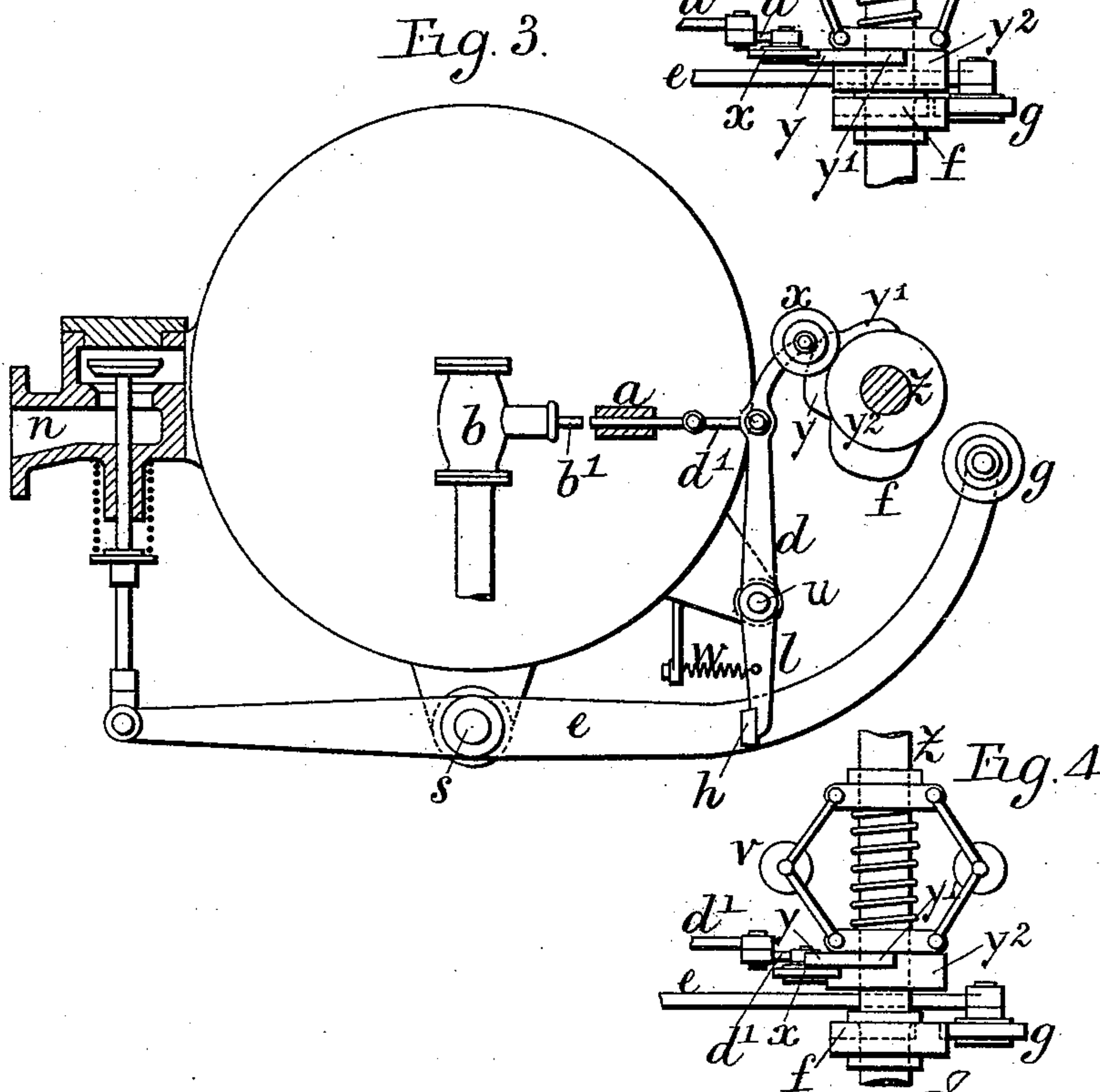
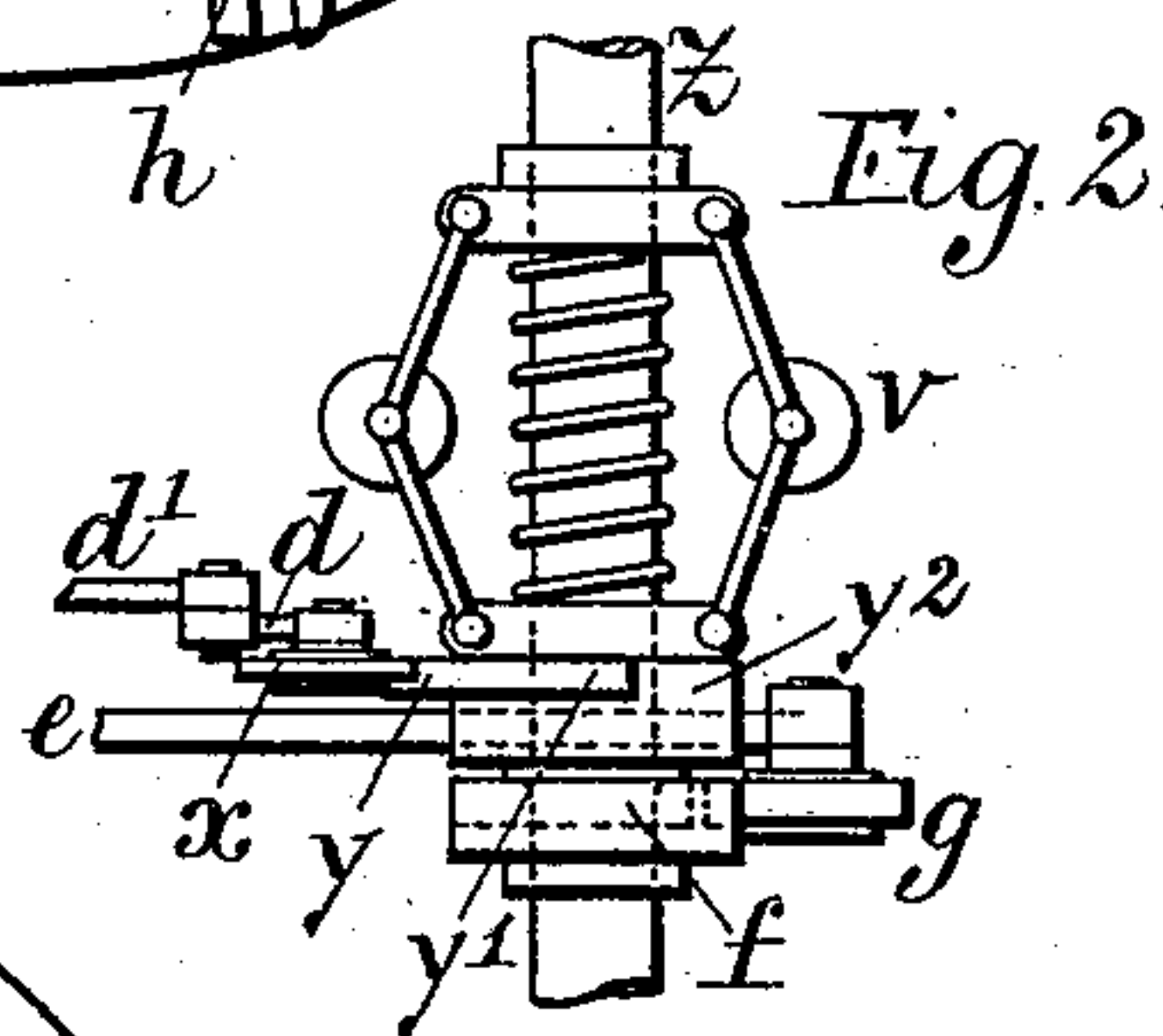
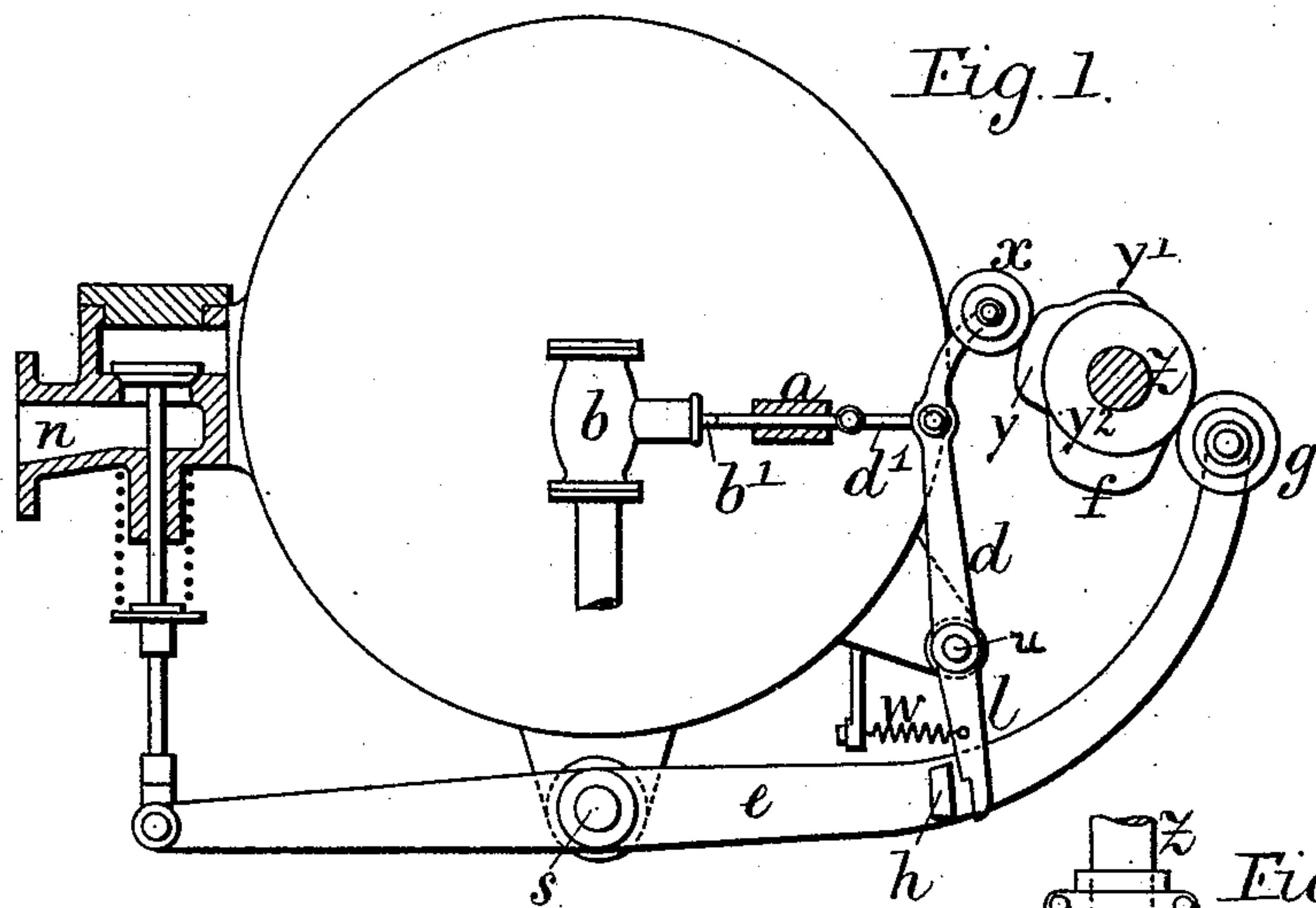
(No Model.)

H. SCHUMM.

VALVE GEAR FOR GAS OR PETROLEUM MOTOR ENGINES.

No. 495,376.

Patented Apr. 11, 1893.



Witnesses:  
J. A. Rutherford  
R. H. Smith

Inventor:  
Hermann Schumm  
By Samuel L. Norris.  
Attorney



# UNITED STATES PATENT OFFICE.

HERMANN SCHUMM, OF COLOGNE-DEUTZ, GERMANY, ASSIGNOR TO THE GAS-MOTOREN-FABRIK-DEUTZ, OF SAME PLACE.

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

SPECIFICATION forming part of Letters Patent No. 495,376, dated April 11, 1893.

Application filed August 16, 1892. Serial No. 443,249. (No model.) Patented in Belgium April 15, 1892, No. 99,261, and in Italy May 10, 1892, LXII, 259.

*To all whom it may concern:*

Be it known that I, HERMANN SCHUMM, a citizen of Switzerland, residing at Cologne-Deutz, in the Empire of Germany, have invented new and useful Improvements in Valve-Gear for Gas or Petroleum Motor Engines, (for which I have obtained Letters Patent in Belgium, No. 99,261, dated April 15, 1892, and in Italy, Vol. LXII, 259, dated May 10, 1892,) of which the following is a specification.

In the specification to Patent No. 433,803 of August 5, 1890, was described an arrangement of valve gear for gas and petroleum motor engines which was controlled by an inertia or pendulum governor for regulating the power of the engine in such manner that the gas or combustible vapor supply valve was kept closed when the engine was running too fast, while at the same time the discharge valve was kept open. The present invention relates to a similar construction of valve gear so arranged as to be controlled by a centrifugal governor. Such arrangement is shown on the accompanying drawing in which

Figure 1 shows a part sectional elevation and Fig. 2 a part plan of the mechanism in the position when the discharge valve of the cylinder is closed and the gas supply valve is being opened, and Figs. 3 and 4 show corresponding views of the position of the mechanism for preventing the gas valve from being opened and holding the discharge valve open when the engine is running too fast; only those parts of the engine are shown that are necessary for explaining the invention.

$b$  is the gas supply valve of any known construction, and  $n$  is the discharge valve for the explosion gases. The valve  $b$  is actuated by a cam  $y y'$  and valve  $n$  by a cam  $f$  on the way shaft  $z$  driven from the crank shaft of the engine, the valves being opened by the said cams and closed by spring action. The valve  $b$  is actuated by the cam  $y y'$  through the medium of a lever  $d$  having a boss pivoted loosely on a fixed pin  $u$ , said lever being provided with roller  $x$  and a jointed rod  $d'$  sliding through a fixed guide  $a$  and butting against the stem  $b'$  of the valve  $b$ . The cam  $y y'$  is on a sleeve  $y^2$  which is carried round by, but

can slide longitudinally upon the shaft  $z$ , and it is connected to a centrifugal governor  $v$ , of any known construction, upon the said shaft, so as to be actuated thereby. The cam  $f$  is fixed on the shaft  $z$  and acts upon the discharge valve  $n$  through lever  $e$  pivoted at  $s$ , and having a roller  $g$  on which the cam acts, the other end of the lever  $e$  being connected to the valve stem. The boss of the lever  $d$  also has an arm  $l$ , acted upon by a spring  $w$ , and having a notch by which it can catch on to a stud  $h$  on lever  $e$ , when this is in the position shown at Fig. 3.

The action of this mechanism is as follows. When the engine is running at the normal speed, the governor  $v$  holds the sleeve  $y^2$  of cam  $y y'$  in the position shown at Fig. 2 in which position the cam  $y$  will act upon the roller  $x$  of lever  $d$  so as to cause this to push open the gas admission valve by means of the rod  $d'$ , as shown at Fig. 1. When on the other hand the engine is running too fast, the sleeve  $y^2$  will be drawn by the governor into the position shown at Fig. 4, in which the cam  $y y'$  is prevented from acting upon the gas valve, so that this remains closed during the charging stroke.

It will be seen from Fig. 3 that when the roller  $x$  of lever  $d$  is running on the sleeve  $y^2$  it causes the lever  $d$  and catch lever  $l$  to be held in such a position that when lever  $e$  has been depressed by cam  $f$  so as to open the discharge valve  $n$ , the notch of  $l$  will engage with the stud  $h$  on the lever, and will thus prevent the discharge valve from closing so long as the combustible gas supply is being cut off as above described. When, however, the engine is running at the normal speed and the cam  $y$  consequently operates the gas valve, a shallow step  $y'$  acts on the lever  $d$  at the moment when the lever is about to be released from the cam  $f$ , so as to move the catch lever  $l$  sufficiently to the right to prevent its notch from engaging with the stud  $h$ , and consequently the lever  $e$  is not prevented from moving upward so as to allow the discharge valve to close at the proper time. When the gas valve is closed, the end of the rod  $d'$  is a certain distance away from the end of the valve rod  $b'$ , so that the shallow step  $y'$  of the cam  $y y'$  can



move the lever  $d$  to the extent above indicated without causing it to open the gas valve, this being only effected by the higher step  $y$  of the cam as at Fig. 1.

5 It will readily be seen that instead of causing the governor to move the cam sleeve  $y^2$ , this might be fixed, and the governor be made to move either the roller  $x$  upon the lever  $d$  or the lever  $d$  itself.

10 Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

15 In a gas motor engine, the combination of a cam  $yy'$  on a sleeve  $y^2$  capable of being slid on the way shaft  $z$  by a governor  $v$ , a lever  $d$  with roller  $x$  engaging with cam  $yy'$  when the engine is running at the normal speed, and having a rod  $d'$  actuating the gas valve  $b$ , an arm  $l$ , rigidly connected to lever  $d$ , a lever  $e$

connected to the discharge valve  $n$  and oper- 20  
ated by a cam  $f$  on the shaft  $z$  so as to open said valve at the end of the working stroke, and a stud  $h$  on said lever  $e$  adapted to en-  
gage with arm  $l$  when cam  $yy'$  is slid out of 25  
gear with lever  $d$ , and thus to hold the discharge valve open, the arm  $l$  being prevented from engaging with the stud  $h$  by the action  
of cam  $y'$  on roller  $x$  when the engine is run-  
ning at the normal speed, substantially as de-  
scribed. 30

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 29th day of July, A. D. 1892.

HERMANN SCHUMM.

Witnesses:

FRITZ SCHROEDER,  
SIBILLA LANG.