

No. 755,079.

PATENTED MAR. 22, 1904.

N. L. & W. W. TUCK.  
FUEL INJECTOR FOR OIL ENGINES.

APPLICATION FILED JULY 22, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

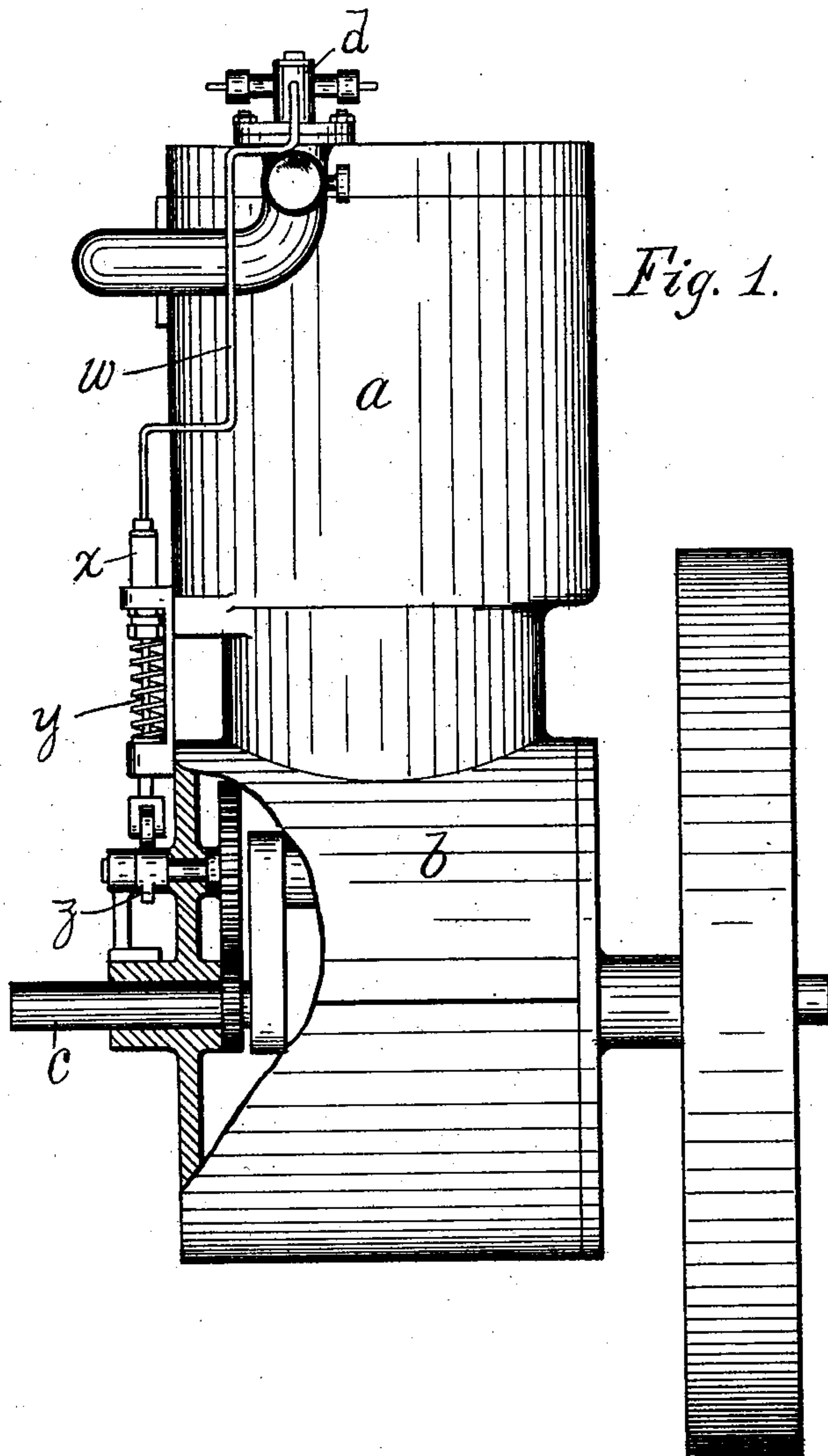


Fig. 1.

WITNESSES:

Herman Lewis  
Frank Ryall

Nelson L. Tuck  
Wm. W. Tuck

INVENTORS:

BY Richard W. Parker,

ATTORNEY.

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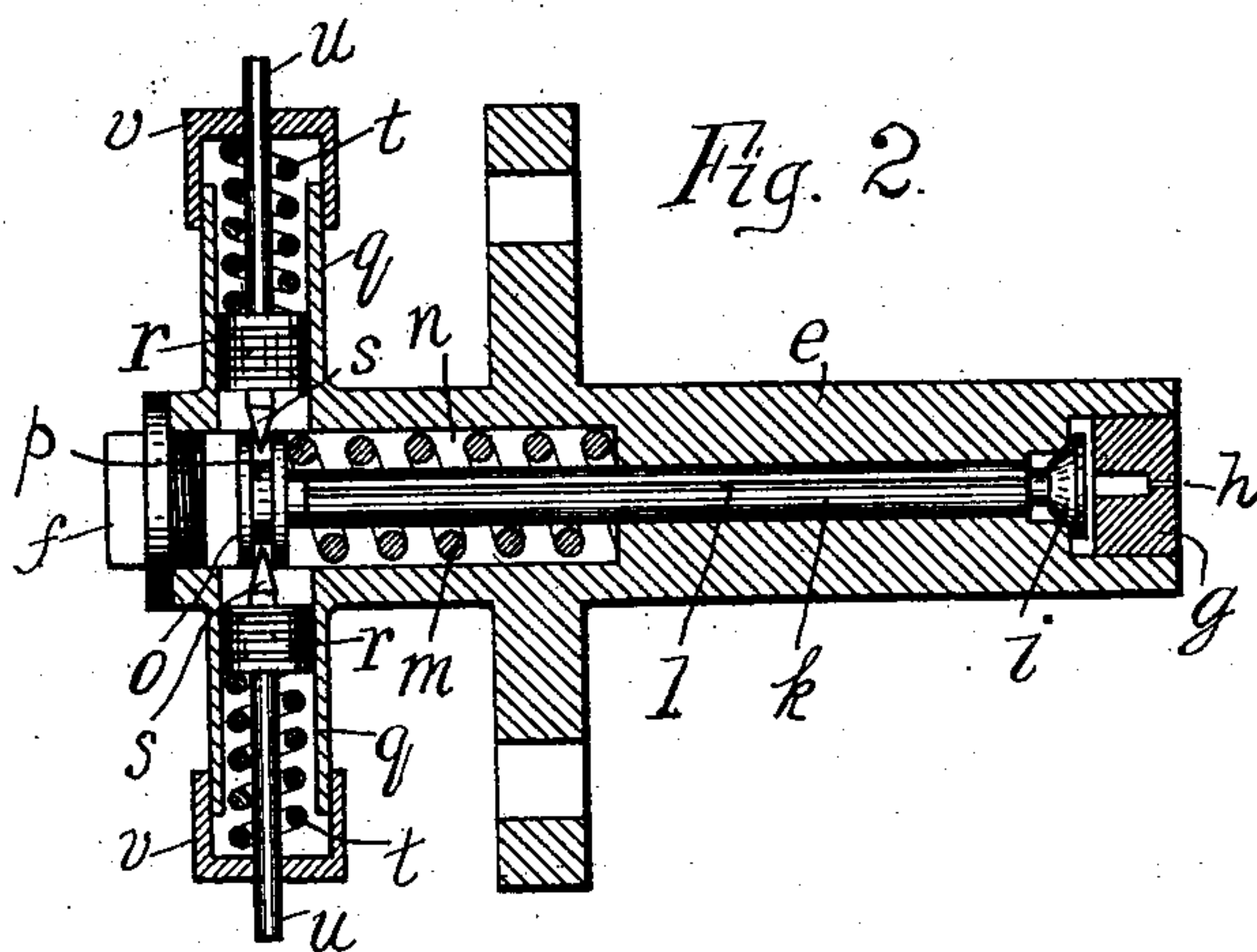


Fig. 2.

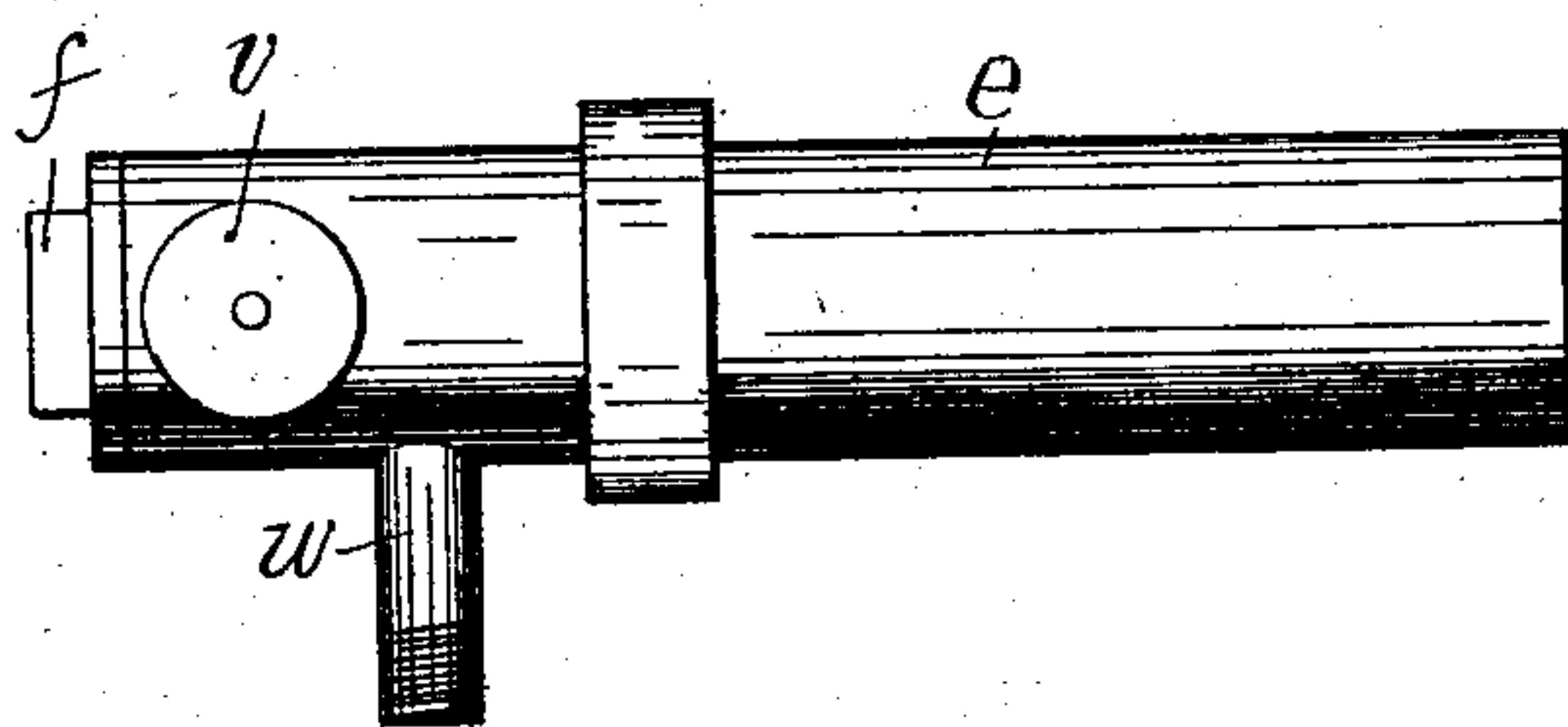


Fig. 3.

WITNESSES:

*Herman Lewis*  
*Frank Gall*

*Nelson L. Tuck*  
*Wm. W. Tuck*

INVENTORS.

BY *Richard W. Parkey*

ATTORNEY.



# UNITED STATES PATENT OFFICE.

NELSON L. TUCK AND WILLIAM W. TUCK, OF BROOKLYN, NEW YORK.

## FUEL-INJECTOR FOR OIL-ENGINES.

SPECIFICATION forming part of Letters Patent No. 755,079, dated March 22, 1904.

Application filed July 22, 1903. Serial No. 166,528. (No model.)

*To all whom it may concern:*

Be it known that we, NELSON L. TUCK and WILLIAM W. TUCK, citizens of the United States, and residents of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Fuel-Injectors for Oil-Engines, of which the following is a specification.

This invention relates to injectors for internal-combustion engines using a hydrocarbon explosive agent, and has for its primary object the automatic control of the feed. Other objects will appear hereinafter.

One form of the invention is shown in the accompanying drawings, (two sheets,) forming part hereof, in which—

Figure 1 is an elevation of an explosion-engine, partly broken away to show the mechanism in which the invention is embodied. Fig. 2 is a section, on a central vertical plane, of the injector; and Fig. 3 is a side view of the same.

In the drawings the reference *a* marks a suitable cylinder, to which is attached a casing *b*, in which the crank-shaft *c* is journaled in any suitable manner.

*d* marks the injector, which is suitably fixed or mounted on the air-pipe.

The injector shown in the drawings consists of a tubular body *e*, whose enlarged end bores are joined by a constricted or smaller-diameter bore, and its ends are closed by screw-plugs *f* *g*. The plug *f* is imperforate, while the plug *g* is provided with a small perforation *h* therein in the axial line of the casing *e*. The bore at this end is provided with a valve-seat for a coned valve *i*, whose stem *k* fits in the said smaller-diameter bore and is provided with one or more longitudinal channels *l* for the oil. A spiral spring *m* surrounds the stem *k* and bears against the bottom of a larger bore *n* of the casing *e* and a collar *o*, fast on the stem *k*, the function of this spring being to seat the valve *i*. The collar *o* is grooved circumferentially at *p*, as shown, and the casing *e* is provided with tubular arms *q* at opposite sides thereof, in which pistons *r* fit tightly, being suitably

packed. Pistons *r* are provided with conical or cam points *s*, which are arranged to engage with the side of the groove *p* to move the valve *i* onto its seat. Springs *t* surround the piston-rods *u* and move the pistons *r* inward or toward the collar *o*. Screw-caps *v* act as guides for the rods *u*.

The reference *w* marks the inlet-tube for the hydrocarbon, which is supplied by a pump *x*, whose piston-rod *y* is operated by a cam or toe *z*, which is suitably driven from the shaft *c* by gearing. The injector is arranged with the plug end *g* projecting into a space which forms part of or connects with the cylinder *a*, as will be understood.

The cam-catches *s* are normally in engagement with the collar *o*, as shown, and act to draw the valve *i* firmly against its seat. Sufficient pressure of the oil supplied by the pump overcomes the resistance of the springs *t* and moves pistons *r* outward, thereby causing cams *s* to release the collar *o* and valve *i*, thus permitting the pressure in the injector to overcome the spring *m* and open the valve *i*, whereupon oil will pass through the perforation *h* as required.

The tension of springs *t* may be varied by means of the caps *v*, while the tension of the spring *m* may be varied by means of washers or liners placed between the same and the bottom of the bore in which it is placed.

What is claimed is—

1. In a hydrocarbon or explosion engine, a fuel-injector provided with a spring-seated valve opening toward the cylinder, catches for holding said valve on its seat, and means controlled by the pressure of the hydrocarbon for releasing said catches, in combination, substantially as described.

2. In a hydrocarbon or explosion engine, a fuel-injector provided with a valve opening toward the cylinder, a collar on the valve-stem, cams coacting with said collar to seat said valve, and means controlled by the pressure of the hydrocarbon for causing said cams to permit said valve to be unseated, in combination, substantially as described.

3. In a hydrocarbon or explosion engine, a

fuel-injector provided with a spring-seated  
valve opening toward the cylinder, spring-  
catches arranged to hold said valve on its seat,  
and means controlled by the pressure of the  
5 hydrocarbon for causing said catches to re-  
lease said valve, in combination, substantially  
as described.

Signed at New York city, in the county of

New York and State of New York, this 21st  
day of July, A. D. 1903.

NELSON L. TUCK.  
WILLIAM W. TUCK.

Witnesses:

FRANK RYALL,  
R. W. BARKLEY.