

No. 897,023.

PATENTED AUG. 25, 1908.

A. K. SCHAAP.
PACKING FOR GAS ENGINE VALVE STEMS.
APPLICATION FILED AUG. 8, 1907.

Fig. 1.

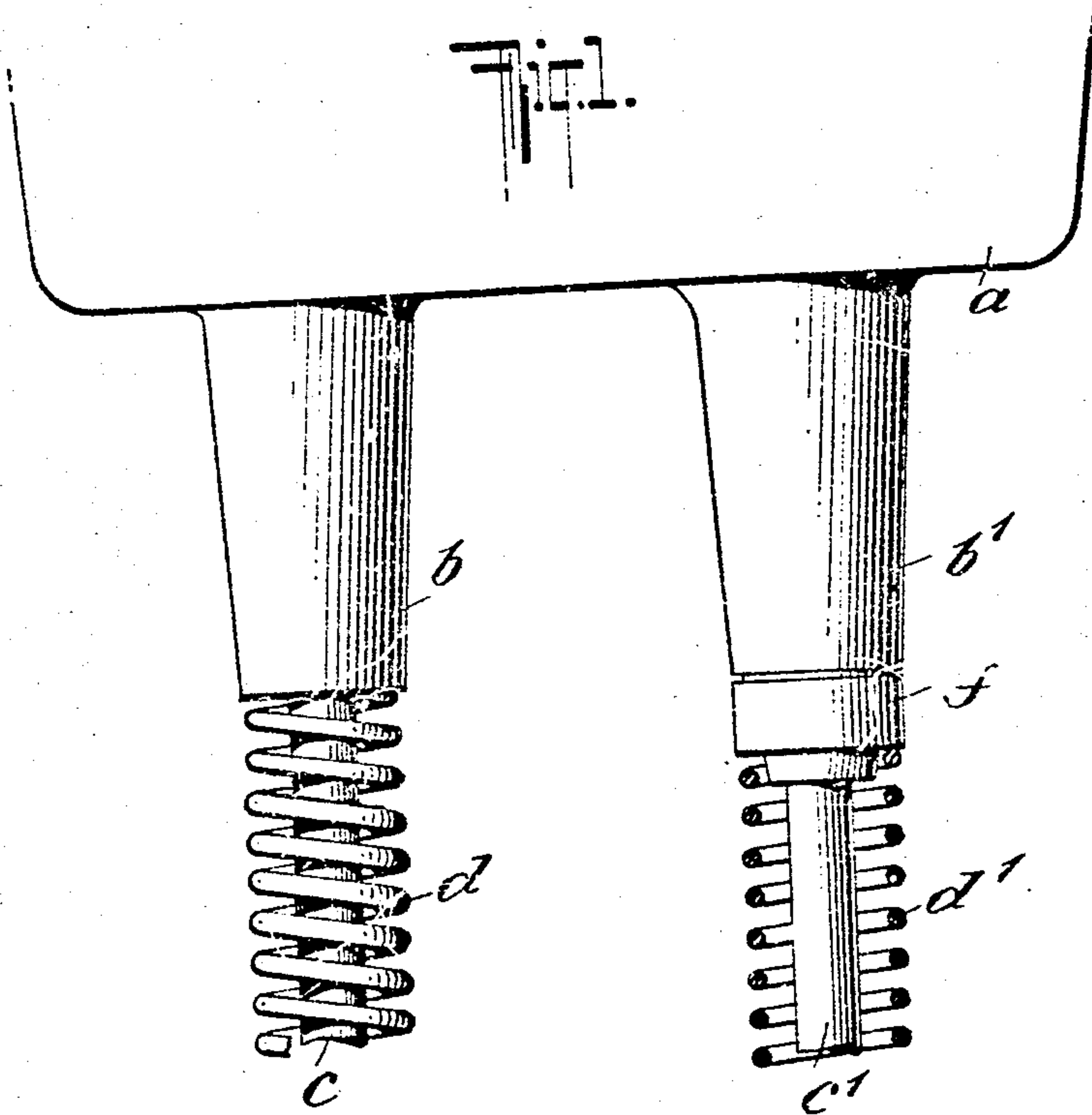


Fig. 2.

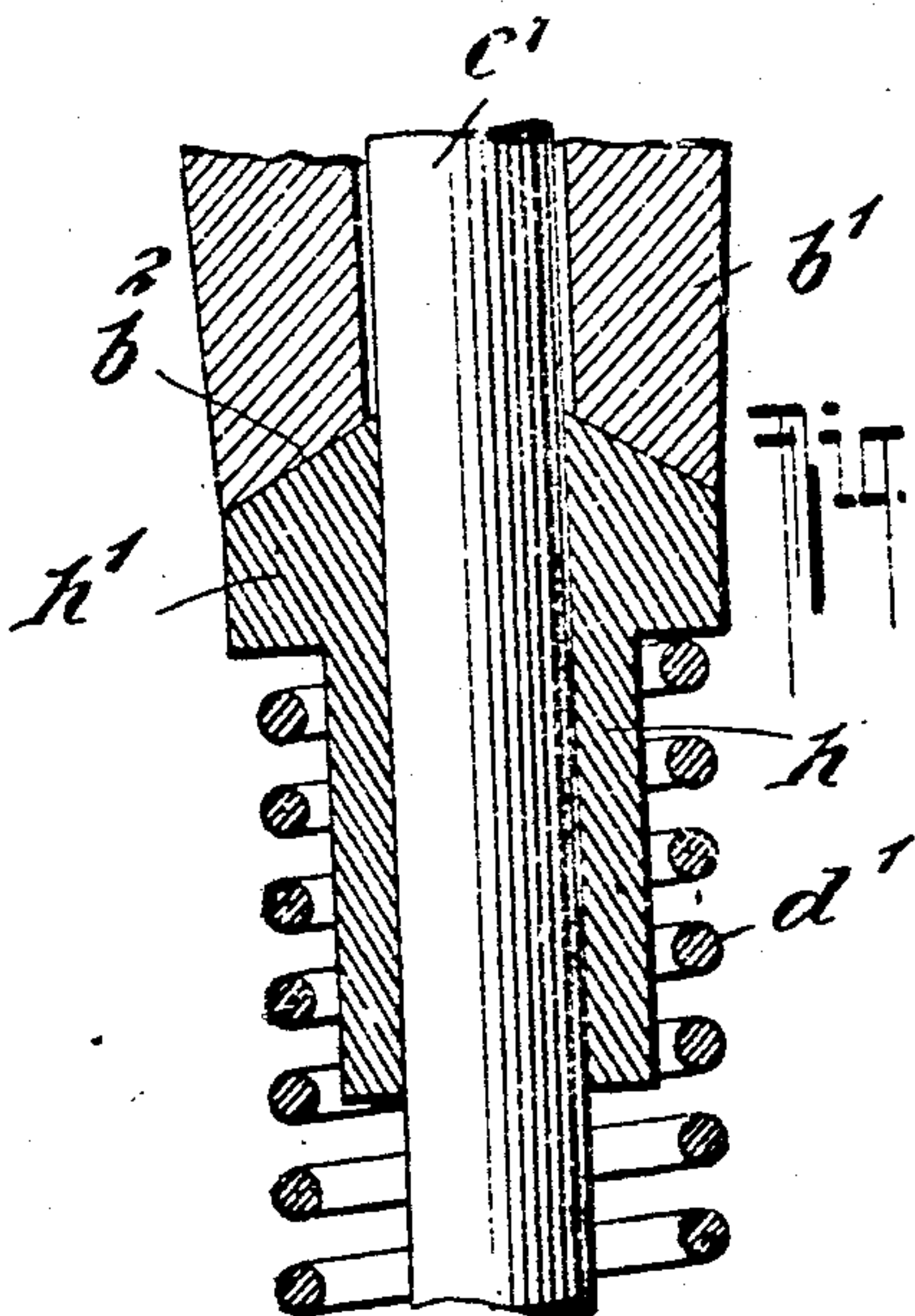
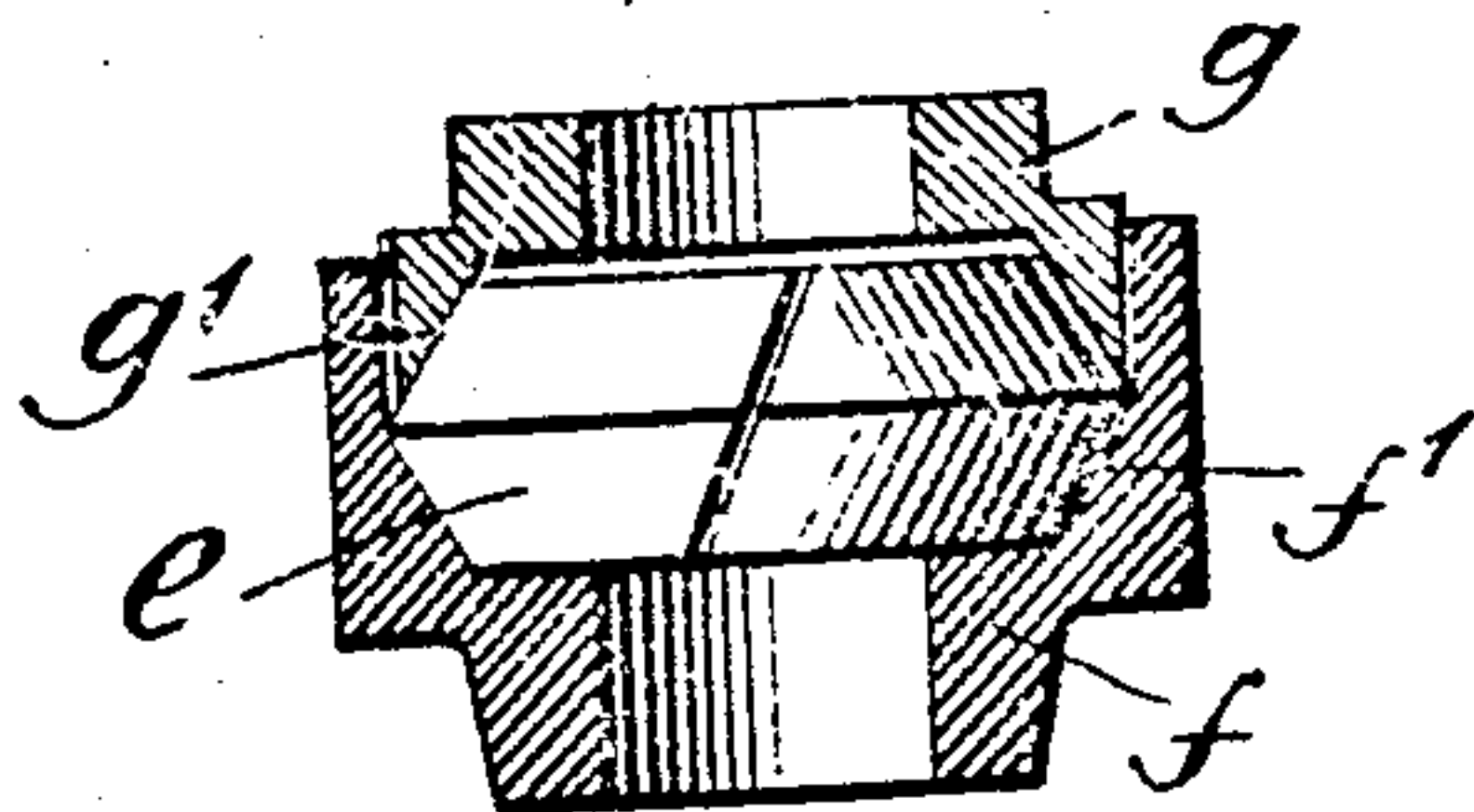


Fig. 3.

Witnesses:
Julius B. [Signature]
C. J. Horton

Inventor
Alexander K. Schaap
By *Wm. B. Owen*

UNITED STATES PATENT OFFICE.

ALEXANDER K. SCHAAP, OF NEW YORK, N. Y., ASSIGNOR TO EVA C. SCHAAP, OF BROOKLYN, NEW YORK, DOING BUSINESS AS SCHAAP AUTOMOBILE COMPANY, A FIRM.

PACKING FOR GAS-ENGINE VALVE-STEMS.

No. 897,023.

Specification of Letters Patent.

Patented Aug. 25, 1908.

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To all whom it may concern:

Be it known that I, ALEXANDER K. SCHAAP, of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Packing for Gas-Engine Valve-Stems, of which the following is a full, clear, and exact specification, such as will enable others skilled in the art to which it appertains to make and use the same.

In standard four cycle gas engine construction the cylinder is filled with the working charge either from the gas supply or from a carbureter by suction through the inlet valve of the working chamber and particularly in the case of oil engines fitted with carbureters a common defect is the leakage of air between the puppet valve stem and the guide thereof. In gasoline engines this defect is frequently so great that the proper carbureting of the gasoline is prevented and the engine operates irregularly and unsatisfactorily.

The underlying object of my present invention is to prevent this defect without, however, making the connection between the valve stem and its guide so tight as to interfere with the proper mechanical operation of the parts. I attain this end by providing a device encircling the valve stem and engaging the stem guide at its inner or outer end by which device a tight connection is made between the stem and guide, and which device is associated with means for pressing it firmly against the stem guide during the time that the valve is lifted from its seat, at which time the sucking effort is exerted through the feed pipe line. Preferably, this device is located at the outer or lower end of the stem guide and the spring which is usually provided to seat the valve is made to serve the additional function of pressing the packing device into active position at the time the inlet valve is open, by reason of the fact that as the valve is opened, the spring is compressed and its increased tension exerted on the packing device.

My invention involves various other features of major or minor importance all of which will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is had to the accompanying drawings, which illustrate, as an example, the preferred embodiment of my invention, in which drawings,

Figure 1 represents a fragmentary view of the stems and stem guides of a typical four cycle gasoline engine to the inlet stem of which my invention is applied; Fig. 2 is an enlarged sectional view of the packing device; and Fig. 3 is an enlarged sectional view of a modified form thereof.

In Fig. 1, *a* indicates a fragment of the valve housing from which the exhaust stem guide *b* and admission stem guide *b'* project; and *c* and *c'* respectively indicate the exhaust and admission valve stems, while *d* and *d'* respectively indicate the springs engaging the lower ends of the stems to seat the valves. All of these parts are not changed by my improvement excepting that it is advisable, as shown in Fig. 3, to slightly counterbore the lower end of the stem guide as at *b''*.

As here illustrated, the device is applied to the lower or outer end of the stem guide as contradistinguished from the upper or inner end and the device shown in Figs. 1 and 2 comprises a split metallic packing ring *e* having a double taper engaged respectively by the correspondingly formed inner surfaces *f'* and *g'* of members *f* and *g* corresponding respectively to the usual stuffing box and gland. The stem *c'* passes through the parts *e*, *f* and *g* and pressure tending to move the parts *f* and *g* toward each other, compresses the ring *e* around the stem preventing all leakage at this point. The packing device, as shown in Fig. 2, is engaged at its upper end with the lower end of the stem guide *b*, while its lower end is engaged by the spring *d'*. At all times the spring holds the members *f* and *g* snugly together, but as the valve rises from its seat, the spring *d'* is compressed and its tension increased, thus increasing the force of the engagement of the ring *e* with the stem *c'*. In this manner the device is kept comparatively inactive except at the instant the valve is opened. At this time, the suction is exerted through the carbureter, and at this time a hermetic packing is necessary. The lower end of the stem guide *b'* may be slightly counterbored if desired, to receive the reduced upper end of the gland *g* while the stuffing box *f* has the reduced lower portion to be encircled by the upper end of the spring *d'*.

In the modification of the device shown in Fig. 3 a sleeve *h* is employed, this sleeve encircling the stem *c'* and having an enlargement *h'* at its upper end. This enlargement

is tapered or conical to correspond with the conical counterbore b^2 . The spring d' engages the under side of the head h' and operates precisely as before explained. The sleeve h has a micrometer fit on the stem c' and the connection between the head h' and the counterbore b^2 is ground in to make a tight joint. The sleeve h may be of metal and the stem may slide therein. It will be seen, however, that no disadvantage would follow from the sleeve sticking slightly on the stem, since this would only serve to render more effectual the hermetic joint between the head h' and the stem guide. To secure, however, a proper mechanical operation of the parts it is necessary that the stem be free in the guide and my invention enables this freedom to be carried to any necessary extent.

20 Having thus described the preferred forms of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with a four cycle gas engine valve stem and guide, of a packing device encircling the stem and engaging the end of the guide to effect a hermetic connection, and means for pressing said packing device yieldingly into active position, such means applying increased pressure during the opening of the inlet valve.

2. The combination with a four cycle gas engine valve stem and its guide, of a packing device encircling the stem and engaging the outer end of the guide and a spring connected to the stem to seat the inlet valve, the spring engaging the packing device for the purpose specified.

3. The combination with a four cycle gas engine valve stem and its guide, of a packing ring encircling the stem, packing members also encircling the stem and inclosing the packing ring and means for pressing said parts against the end of the stem guide for the purpose specified.

4. The combination with a four cycle gas engine valve stem and its guide, of a packing ring encircling the stem, packing members also encircling the stem and inclosing the packing ring and means for pressing said parts against the end of the stem guides for the purpose specified, such means serving to act with increased force during the time that the inlet valve is open.

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

ALEXANDER K. SCHAAP.

Witnesses:

MAHLON A. FREEMAN,
ISAAC B. OWENS.