

No. 639,025.

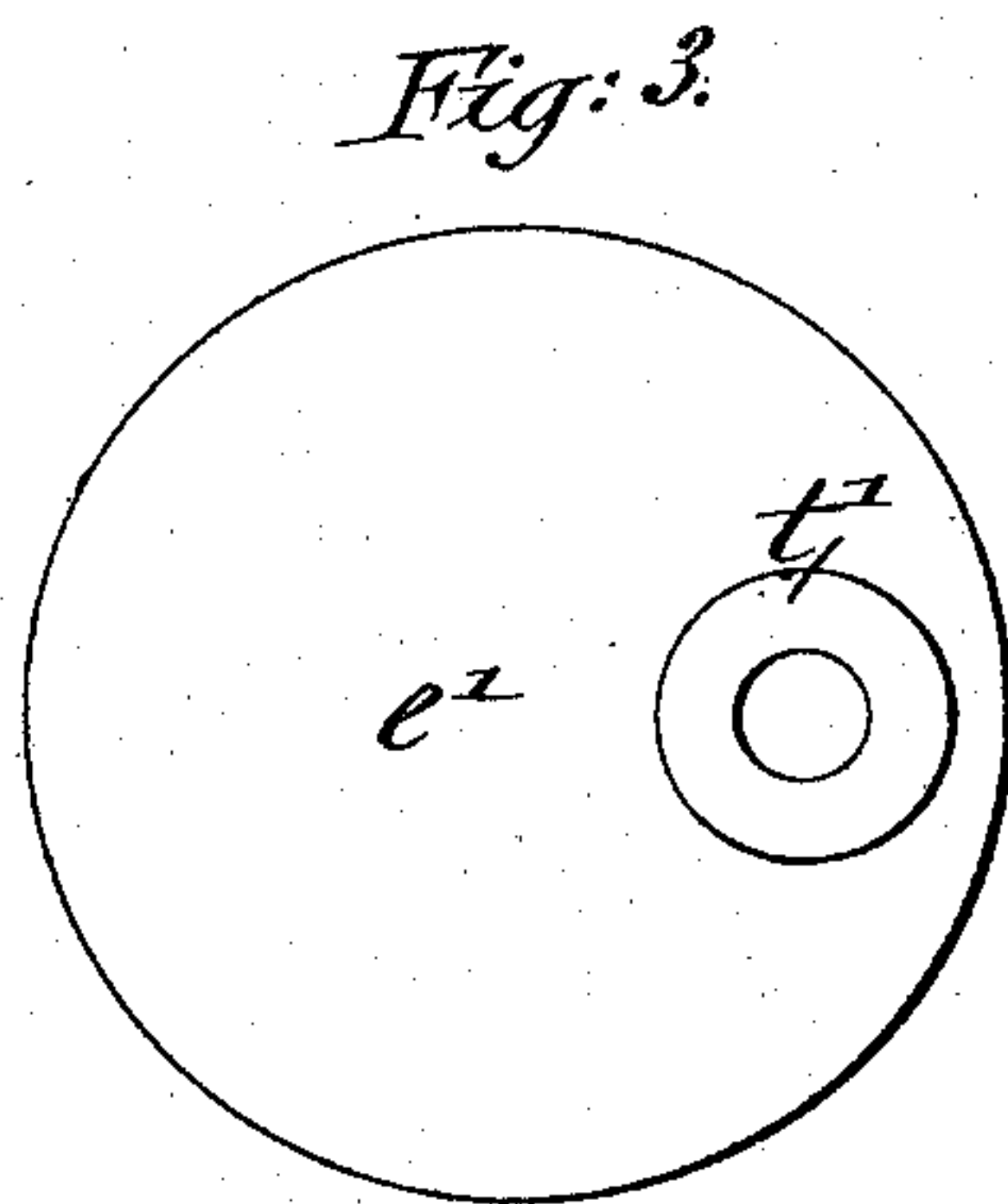
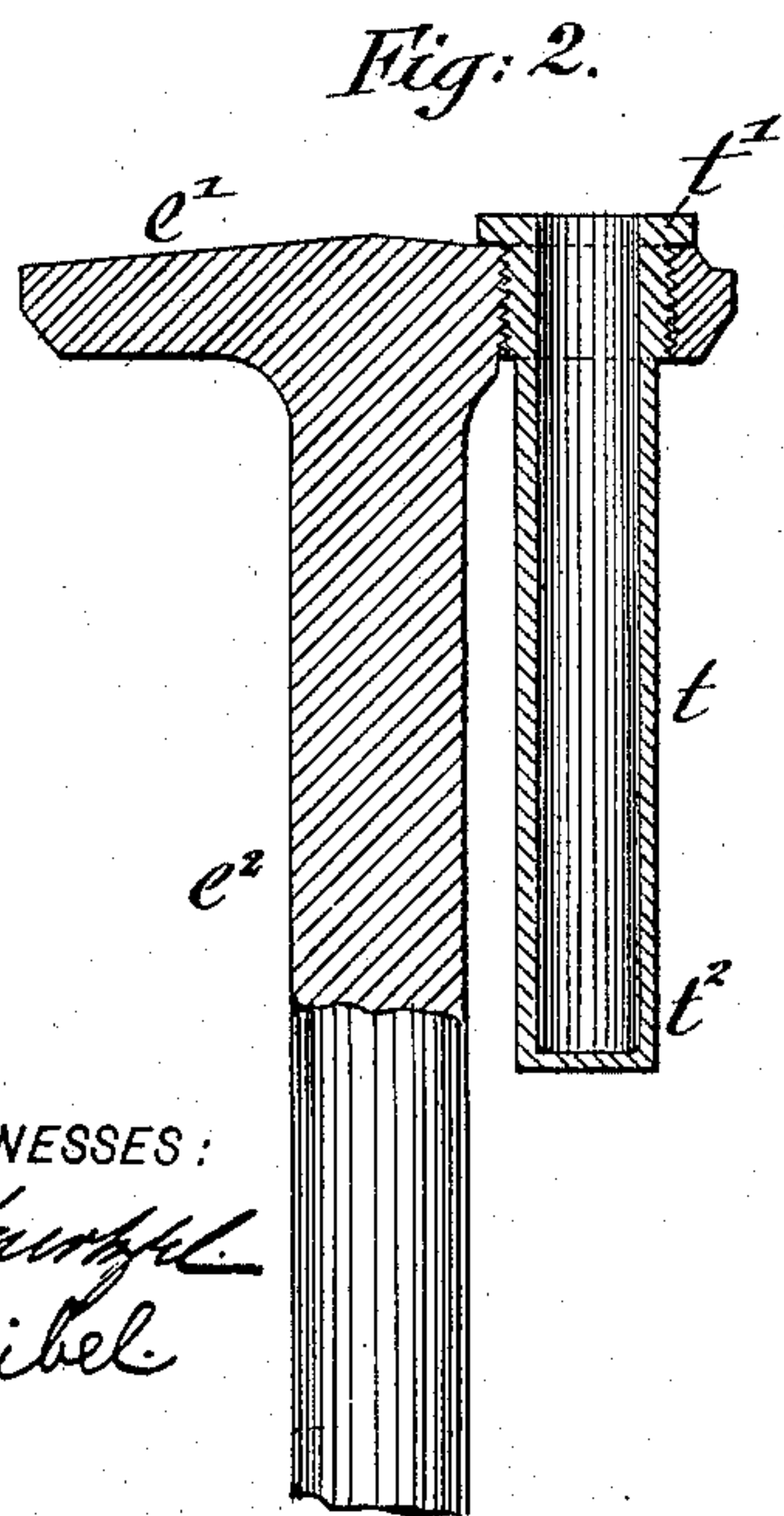
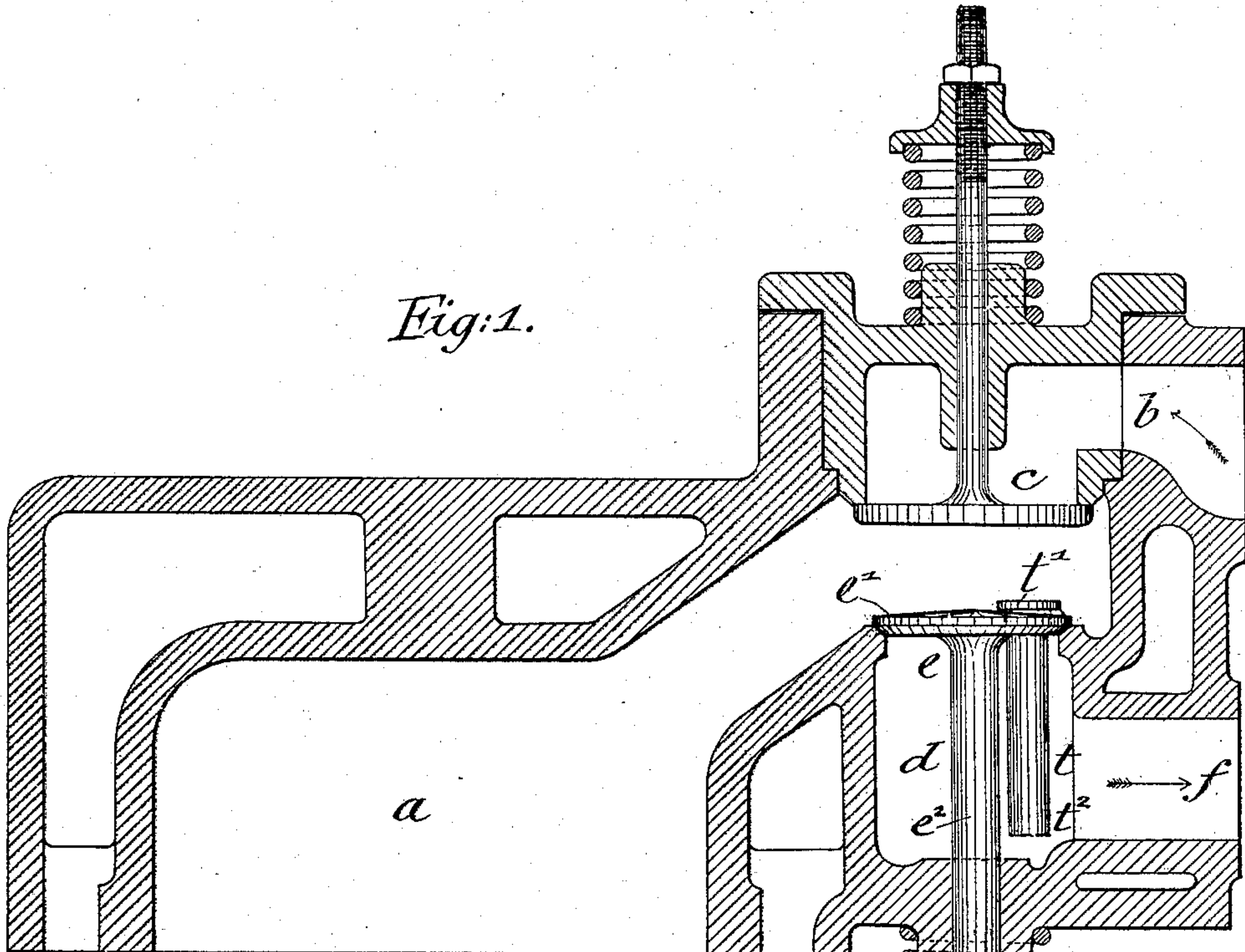
Patented Dec. 12, 1899.

G. EY.

INCANDESCENT TUBE IGNITER FOR GAS ENGINES.

(Application filed Sept. 30, 1899.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

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INCANDESCENT TUBE-IGNITER FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 639,025, dated December 12, 1899.

Application filed September 30, 1899. Serial No. 732,181. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV EY, a citizen of the United States, residing in the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Incandescent Tube-Igniters for Gas-Engines, of which the following is a specification.

This invention relates to igniters for gas-engines and more especially to that class of igniters which is not heated by an independent source of heat outside of the combustion-chamber of the gas-engine, but which is heated to incandescence by the hot products of combustion of the explosions.

The invention is more especially designed as an improvement on the incandescent tube-igniter for which Letters Patent were granted to Ernest W. Graef on April 11, 1899, No. 622,892, in which the igniting-tube is located in the wall of the combustion-chamber and so arranged that the interior is placed in communication with said chamber, while its closed exterior end projects into the exhaust-chamber of the cylinder. This igniter is reliable when applied to engines of large size; but it fails to work reliably when applied to smaller engines—as one-horse power, or so—for the reason that the products of combustion are not present in sufficient quantity to produce the reliable working of the igniter and the regular ignition of the explosive gas-and-air mixture. By a series of tests I found that the action of the igniting-thimble is more reliable the nearer the same is placed to the exhaust-flame and the products of combustion. When the exhaust-flame and the products of combustion have to pass some distance before they form contact with the igniting-thimble, they are cooled off to such an extent that the heating up of the thimble to the proper temperature is not effected, so that the ignition action of the same is not reliably secured. However, by placing the igniting-thimble as close as possible to the combustion-chamber and to the adjacent end of the exhaust-chamber, so that the thimble is lapped around instantly by the exhaust-flame as soon as the explosion occurs and the exhaust-valve is opened, then the thimble is heated to the proper degree of incandescence, so as to perform its function of igniting the next charge of compressed gas-

and-air mixture in a perfectly reliable manner. For this purpose my invention consists of an automatic igniter for gas-engines which is composed of a thimble inserted into the exhaust-valve of the combustion-chamber and having its open end in communication with the combustion-chamber, while its closed end is located in the exhaust-chamber, as will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a vertical section of the combustion-chamber of a gas-engine, showing the inlet and outlet valves and my improved automatic igniter inserted into the body of the exhaust-valve and projecting at its closed end into the exhaust-chamber. Fig. 2 is a side view, partly in vertical section, on a larger scale, showing the exhaust-valve and the igniting-thimble; and Fig. 3 is a plan of the exhaust-valve and igniter.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, *a* indicates the combustion-chamber of a gas-engine of any approved construction, the cylinder of which, as shown, is jacketed so as to furnish a space for the cooling medium encircling the same. *b* is the gas-supply pipe; *c*, the inlet-valve of the same.

d is the exhaust-chamber, and *e* the exhaust-valve, located at the point of connection of the same with the combustion-chamber. *f* is the exhaust-pipe.

t is a thimble which is made of platinum, nickel-steel, or other suitable material and which is provided near its flanged open end with an exterior screw-thread by which it is screwed into a corresponding opening in the body *e'* of the exhaust-valve in such a manner that the open end *t'* communicates with the combustion-chamber *a*, while the closed end *t''* of the thimble projects into the exhaust-chamber *d*.

The combustion-chamber is connected with the cylinder of the gas-engine in the usual manner, and the mechanism for operating the exhaust-valve is connected with the stem *e''* of the same and with the crank of the engine operated from the engine-shaft in the manner common in gas-engines.

The combustion-chamber *a* is provided with

any approved electric or other igniter which is used for the initial explosions when the engine is started. In order, however, to render the drawings clear, this igniter has been
5 omitted therefrom. As soon as the engine has made a few turns my improved igniter has become sufficiently heated so as to produce the explosions regularly, and the auxiliary igniter is then stopped. During the op-
10 eration of the gas-engine my improved igniter being carried by the exhaust-valve moves with the same and is placed directly in the path of the exhaust-flame passing from the combustion-chamber to the exhaust-chamber,
15 so that the flame completely surrounds the body of the igniter as soon as the exhaust-valve is opened and the products of combustion are passed from the combustion-chamber to the exhaust-chamber. In this manner the
20 igniting-thimble is moved by the valve in an opposite direction to the passing flame into the very midst of the same, so that the full heat of the products of combustion is exerted on the igniting-thimble and the same is raised
25 to the proper degree of incandescence for the reliable ignition of the explosive mixture supplied at the next charge to the combustion-chamber. No failure of the igniter to attain a sufficient heat can take place and the re-

liable working of the same is always assured 30
even in the smallest engines.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An automatic tube-igniter for gas-en- 35
gines, consisting of a thimble inserted into the body of the exhaust-valve in such a manner that the open end of the same is in communication with the combustion-chamber, while the closed exterior end projects into the ex- 40
haust-chamber, substantially as set forth.

2. An automatic igniter for gas-engines, consisting of a flanged thimble provided with an exterior screw-thread adjacent to the flange, and secured by said screw-thread to 45
the exhaust-valve, the open end of said thimble being in communication with the combustion-chamber, while the outer closed end projects into the exhaust-chamber, substantially
as set forth. 50

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

GUSTAV EY.

Witnesses:

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