

No. 784,359.

PATENTED MAR. 7, 1905.

J. F. STEPHENSON.
TUBE CLEANING DEVICE.
APPLICATION FILED JULY 28, 1904.

Fig. 1

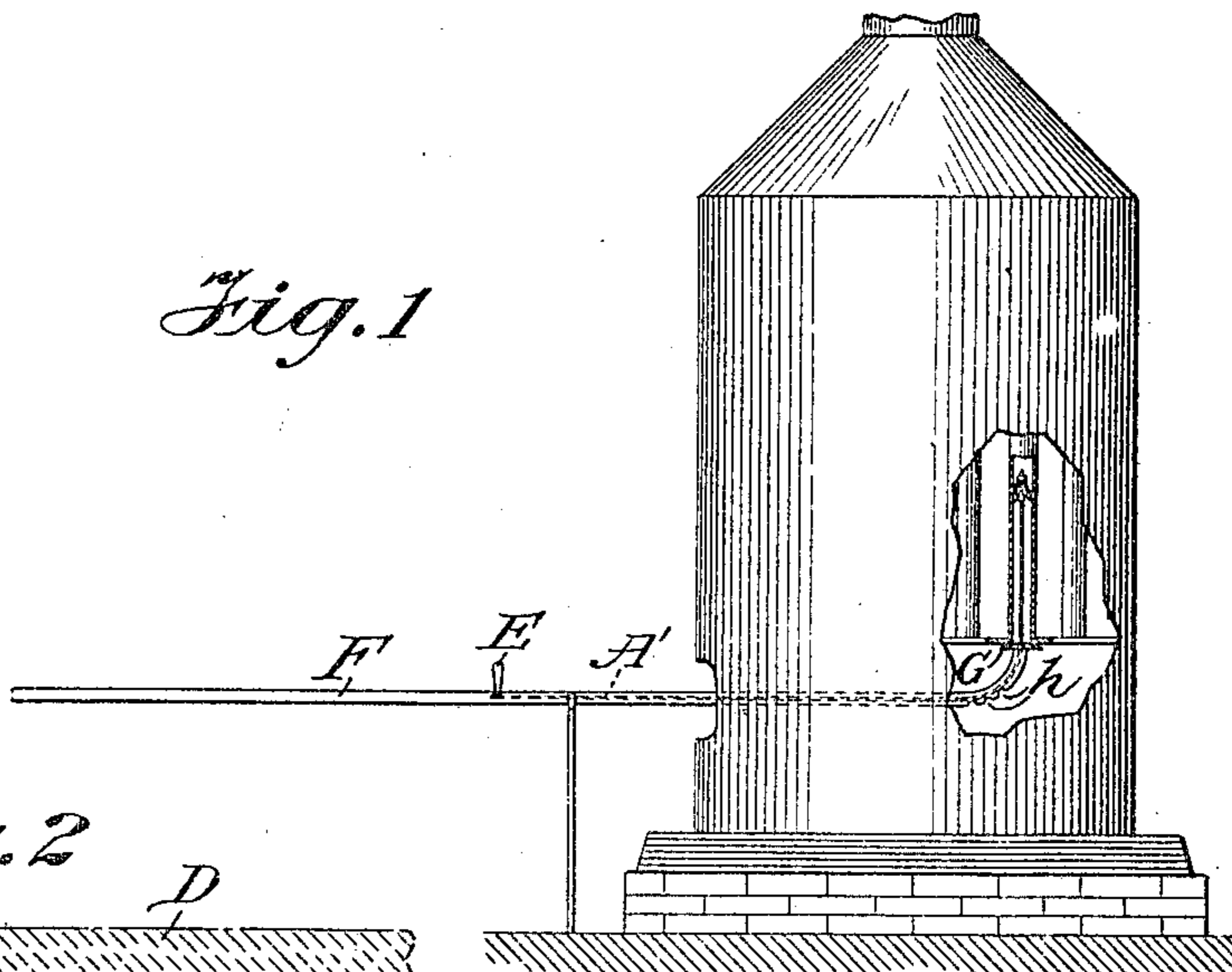


Fig. 2

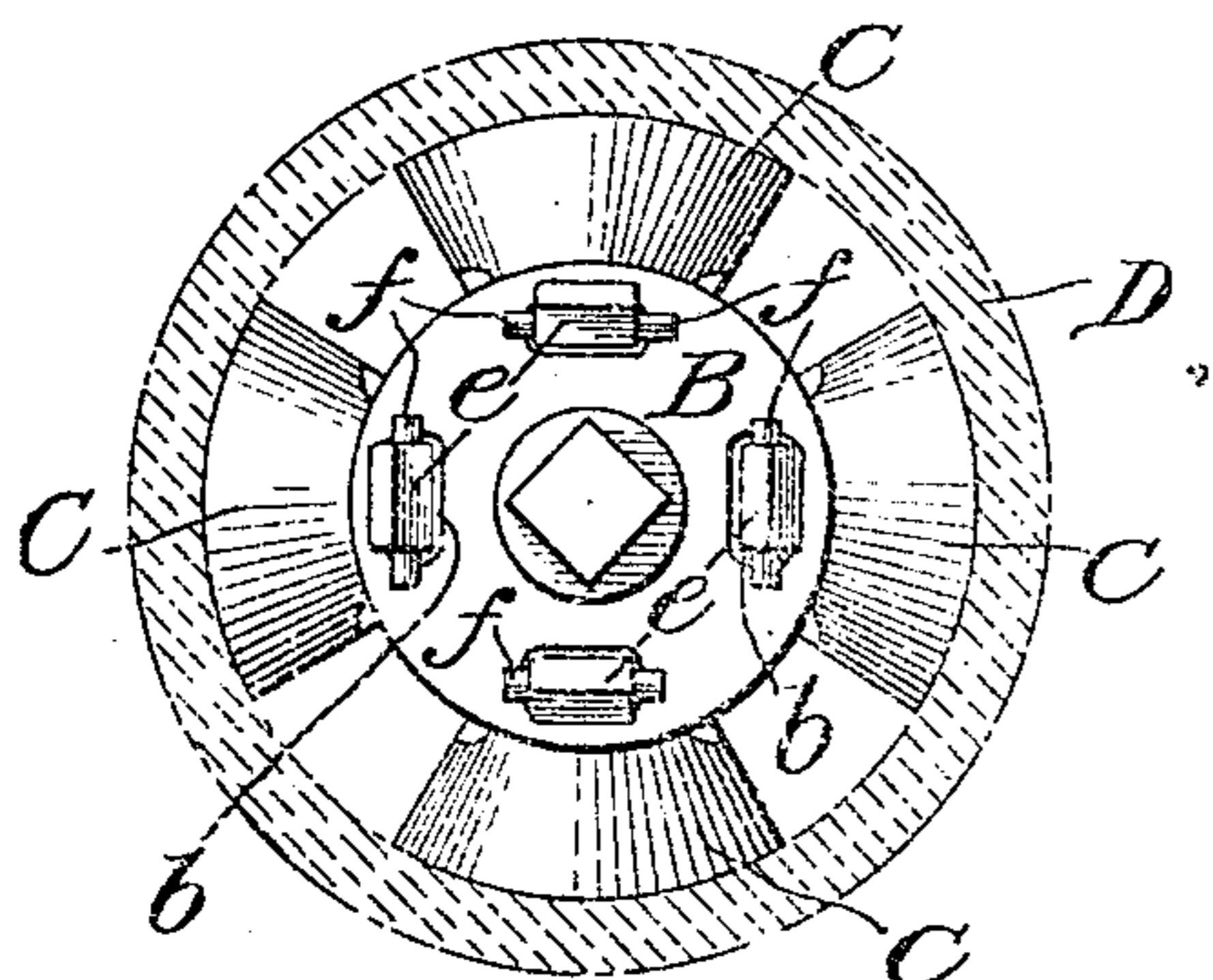
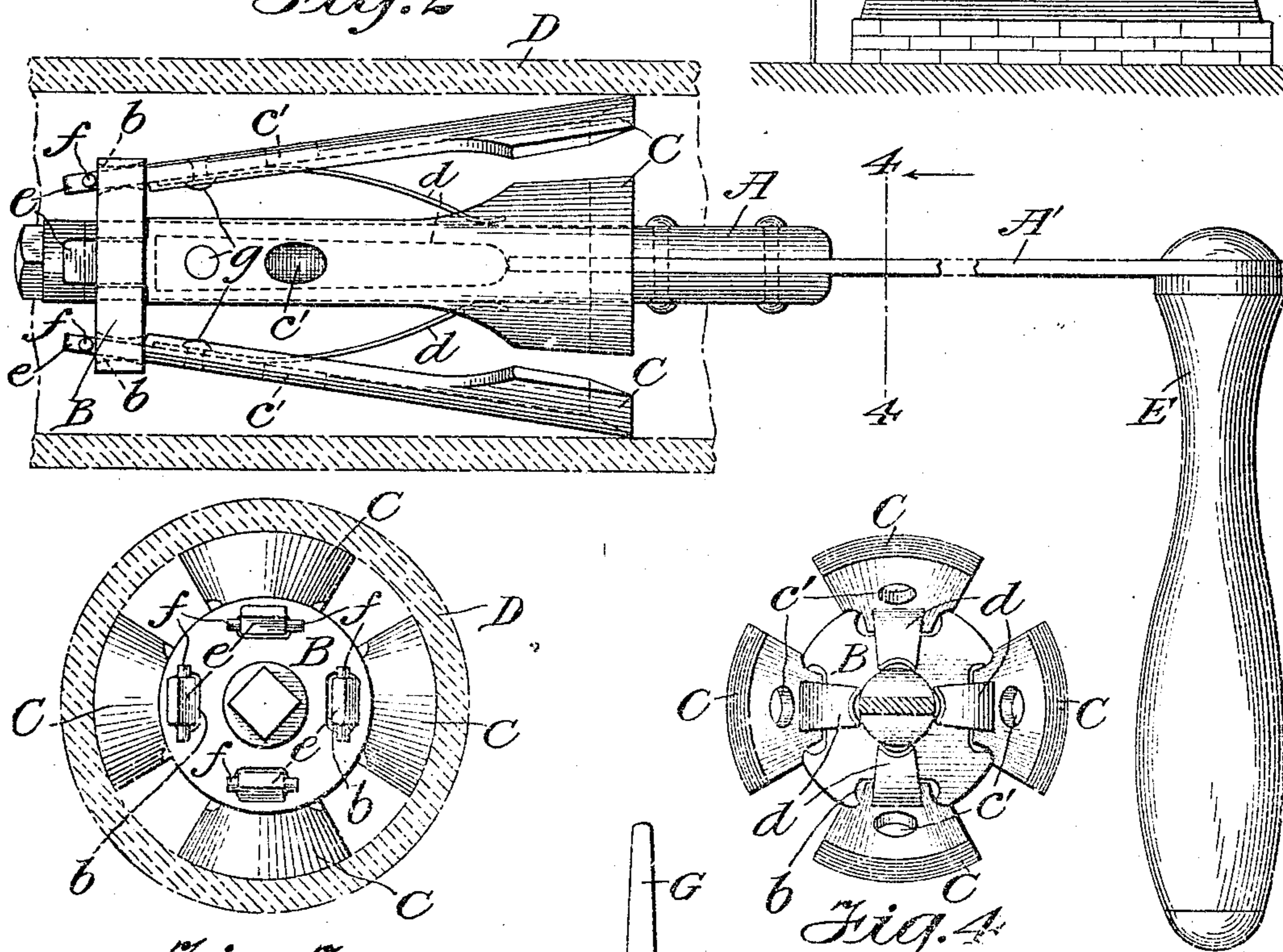


Fig. 3

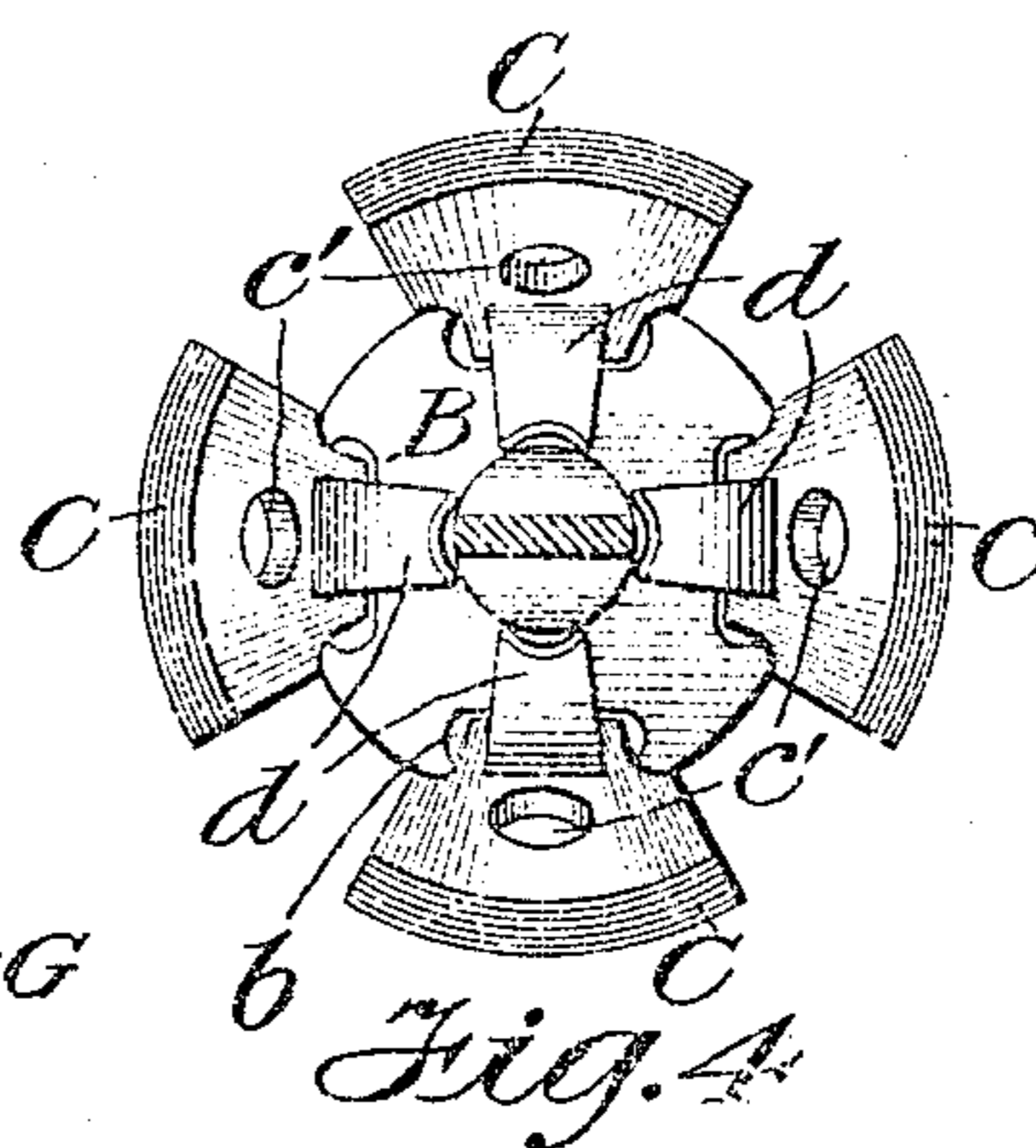


Fig. 4

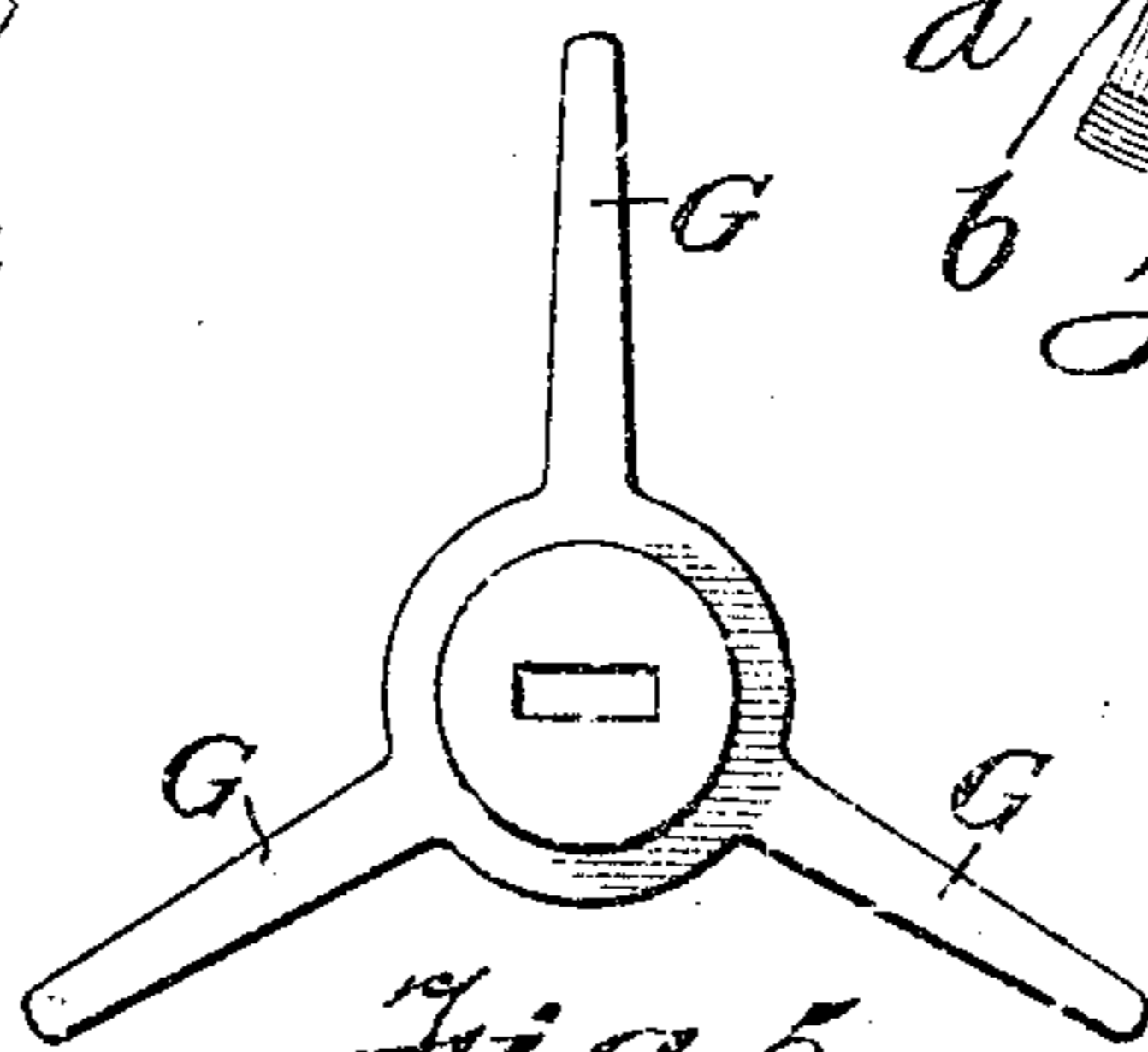


Fig. 5

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN F. STEPHENSON, OF ALBANY, NEW YORK.

TUBE-CLEANING DEVICE.

SPECIFICATION forming part of Letters Patent No. 784,359, dated March 7, 1905.

Application filed July 26, 1904. Serial No. 218,215.

To all whom it may concern:

Be it known that I, JOHN F. STEPHENSON, a citizen of the United States, and a resident of Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Tube-Cleaning Devices, of which the following is a specification.

This invention relates to a device for cleaning the interior surface of flues or pipes which have become obstructed by the incrustations formed on the interior surface—such as rust, soot, &c.—or removing any loose sediment or deposits in the flue or pipe which would tend around the opening area and prevent the free flow or passage of any fluids, air, or heat there-through.

This device is particularly adapted and designed for use in connection with a steam-boiler of the vertical type where the open ends of the tube are in such a position with the bonnet fitting close to the top as to almost prohibit them from being cleaned by the ordinary means. With these conditions in view I have provided a guiding-tube smaller in diameter than that of the boiler-tube and which is so formed as to allow of its being readily placed in position at the end of the boiler-tube successfully and the cleaning device operated from a convenient position by means of a flexible connection of suitable length.

The exact construction and means of operating the device is shown more fully in the accompanying drawings and described in detail in this specification hereinafter.

In the accompanying drawings, forming part of this specification, Figure 1 is a general or side elevation of a tubular boiler of the vertical type, showing the methods of bringing the guiding-tube in connection with one of the boiler-pipes and operating the cleaning device therein by means of a flexible operating-handle from the outside. Fig. 2 is a side elevation of the scraper and cleaner, showing the construction and arrangement of the parts. Fig. 3 is a top plan view of the scraper in position in a boiler-tube. Fig. 4 is a bottom plan view of the scraper, showing a sectional view taken on the dotted line 4 4, Fig. 2. Fig. 5 is a detail view showing an attachment for the end of the guiding-tube to enable it to

be held in place against the end of the boiler-flues.

At A is shown a shaft to which the operating parts are secured. At one end of this shaft is fastened a collar B, which is provided with slots *b* in the outer portion thereof. Scraper-arms C are pivoted and secured in the slots *b* of the collar B by means of a projecting portion *e*, extending through said slots, and a pin *f*, holding the scrapers in position. A shoulder abutting against the opposite side of the collar B secures the scrapers against movement in the opposite direction. The slots *b* are such a size and form as to permit a free movement of the scrapers outwardly and a small amount of play for adjustment sidewise. Flat springs *d* are secured to the scrapers C by means of rivets *g*. These springs engage the shaft A and act to force the scraper-arms C outwardly, and thus insure contact with the inner walls of the tube D and at the same time provide a certain flexibility and permit the scrapers to adjust themselves automatically to variations of the interior wall-tube. The forward end of each of these scrapers C are provided with a cutting edge which insures the material being removed from the inner surface of the tube as the device is drawn through. At points where the springs *d* bear against the scrapers C openings *c* are provided, which permit any material which would otherwise collect between a spring and its scraper and prevent the operation of the device to pass through the opening, and thus leave a clear space for the depression of the flat spring *d*.

At the end of the central shaft A opposite to that at which the collar B is located a flexible operating-rod A' is fastened, which in turn is provided with an operating-handle E. By referring to Fig. 1 the function of this flexible operating-rod will be readily comprehended, as it allows the scraper and cleaner to be easily used in connection with guiding-tube E, which has an angular bend at one end thereof, and thus permits of the application of the tool and tube F to the ends of the boiler-tubes, which are usually in an inclosed space, as shown. This guiding-tube also serves as a receptacle for the scrapings as they are re-

moved from the boiler-tube. A slot is provided in one end of this guide-tube, allowing the handle E to project to the outside thereof, so as to be grasped by the operator.

5 An attachment is shown in Fig. 5 to be used at the end of the guiding-tube F to enable the operator to easily hold the same in place against the end of a boiler flue or tube. This device is provided with a number of project-
10 ing arms G to engage the end of said tube, with spaces between said arms to allow the scrapings—such as soot, &c.—to fall out onto the fire. Openings, such as h, are provided at the elbow of the guiding-tube F to allow
15 any material which falls into said tube to pass out.

It is seen that the construction here shown provides a device of very few operating parts, which are easily and cheaply made, easily re-
20 placed when broken or worn out, and which device is adjustable to variations in the size of the tube in which it is to be used and which, moreover, can be used in connection with tubes—such as boiler-tubes of the vertical
25 type, as shown— which are difficult of access for cleaning by the usual means.

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

30 1. In a device for cleaning flues or pipes, the combination with a central shaft, of a collar secured on the end portion thereof and hav-

ing openings in its outer part, a series of shouldered longitudinal scrapers having their shoulders bearing against the collar, said scrapers 35 having ends extending through the collar-openings and engaged by pins to afford a pivotal connection with the collar, springs connected to the scrapers and bearing against the shaft to normally expand the scrapers, and an 40 operating-handle flexibly connected with the shaft.

2. In a device for cleaning flues or pipes, the combination with a central shaft, of a collar secured on the end portion thereof and hav- 45 ing openings in its outer part, a series of shouldered longitudinal scrapers containing apertures and having their shoulders bearing against the collar, said scrapers having ends 50 extending through the collar-openings and engaged by pins to afford a pivotal connection with the collar, springs connected to the scrapers and bearing against the shaft to normally expand the scrapers, said springs working in relation to the scraper-apertures, and 55 an operating-handle connected to the shaft.

Signed at Albany, in the county of Albany and State of New York, this 11th day of July, A. D. 1904.

JOHN F. STEPHENSON.

Witnesses:

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HUGH A. ARNOLD.