(Model.)

E. T. STARR.

Dental Plugger.

No. 229,769. Patented July 6, 1880.

Fig. 1

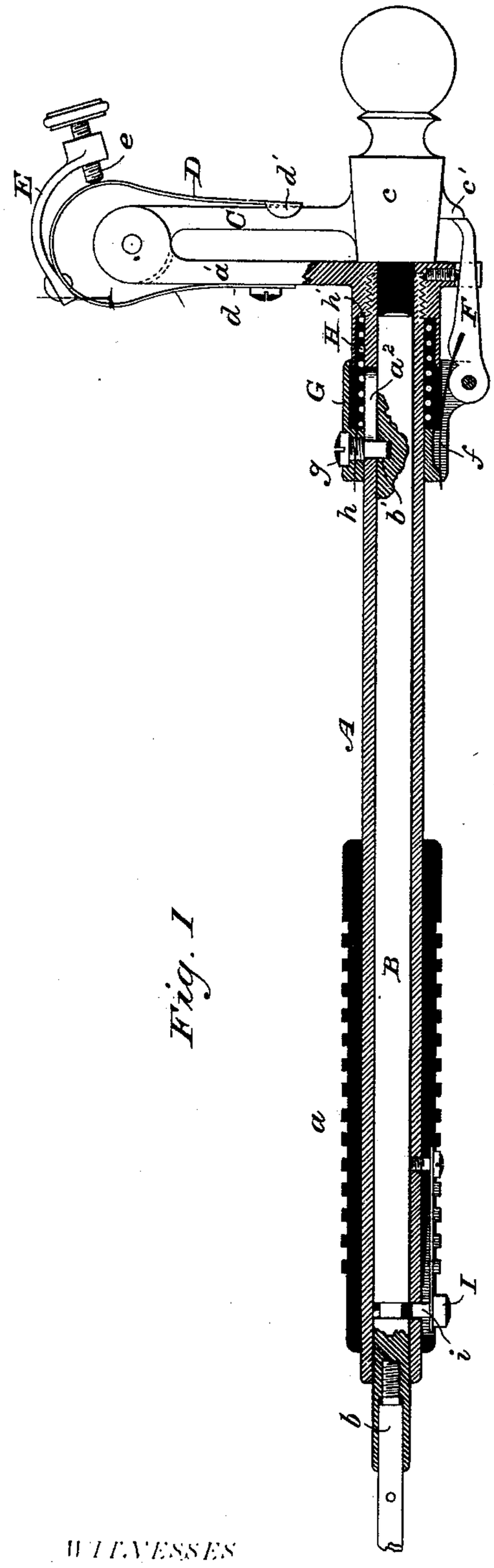

Fig. 2.

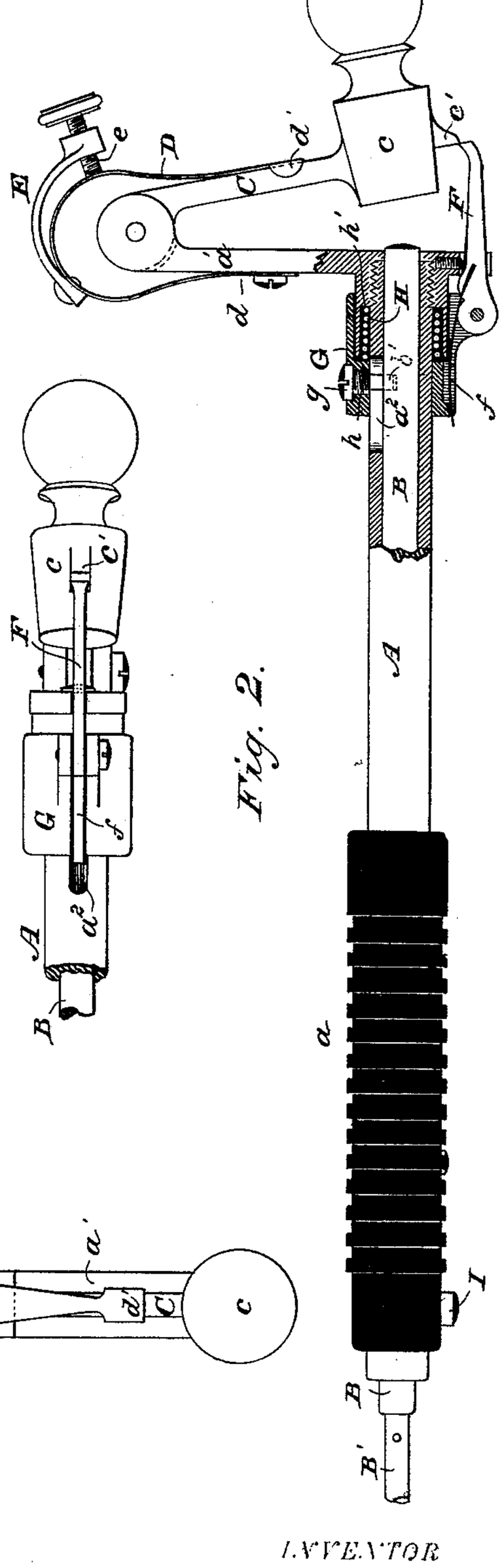

Fig. 3.

Fig. 4.

WITNESSES

Wm A. Skinkle.

Geo W Breck.

INVENTOR

Eli T. Starr.

By his Attorneys

Baldwin, Hopkins, & Peyton.

UNITED STATES PATENT OFFICE.

ELI T. STARR, OF PHILADELPHIA, PA., ASSIGNOR TO JAMES W. WHITE, JAMES CLARENCE WHITE, AND HENRY M. LEWIS, TRUSTEES.

DENTAL PLUGGER.

SPECIFICATION forming part of Letters Patent No. 229,769, dated July 6, 1880.

Application filed April 24, 1880. (Model.)

To all whom it may concern:

Be it known that I, ELI T. STARR, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Dental Pluggers, of which the following is a specification.

My invention relates to the class of instruments used by dentists for impacting the fillings of teeth, commonly known as "dental pluggers," and pertains particularly to mallet-pluggers of the type which are operated entirely by the movement of the hand, and which embody in their organization a handle or casing, a tool-holder movable endwise therein, a hammer or mallet acting upon the tool-holder by giving blows upon its butt-end, an impelling-spring acting upon the hammer, and devices for raising or separating the hammer and tool-holder and for tripping or releasing the hammer so as to permit it to give its blows upon the tool-holder at the proper time.

Such an instrument is shown in Letters Patent of the United States granted to James C. Dean July 11, 1865, reissued December 21, 1875, as No. 6,817, and it is upon said Dean's instrument more especially that my present invention is designed as an improvement.

The object of my said invention is to provide a simple, easily handled, and efficient mallet-plugger, which is capable of being readily adjusted to give blows of the desired force, and which may be used either as an automatic mallet or hammer instrument to give rapidly-repeated blows, or as a simple pressure-tool, as exigency requires.

To this end my invention consists of certain new combinations of devices, which are recited at the end of the specification.

In the accompanying drawings, which illustrate my improvements as organized in the best way now known to me, Figure 1 is a longitudinal central section through the instrument, with the parts in their normal position, and Fig. 2 is a view, partly in elevation and partly in section, the tool-holder being in position to receive a blow from the hammer. Fig. 3 is a view of the instrument from the butt-end, and Fig. 4 is a front or face view of a portion of the instrument.

The handle or casing A of the instrument is preferably made of a single straight metallic piece or tube, and the lower end, which is the end to be grasped by the fingers of the operator, is surrounded by a preferably hard-rubber thimble or finger-piece, *a*, corrugated or grooved to afford a firm hold. A tool-holder, B, is fitted snugly in the casing A, and is permitted endwise movement to a limited extent. The socket *b*, in the front end of said tool-holder, is fitted with a female screw at its inner termination, as usual, which receives the male-threaded end of the plugging-point B′, so as to hold it securely in the socket of the tool-holder while the instrument is in use. The screw-threaded socket also permits easy and ready insertion and removal of the various points or tools commonly used with this class of pluggers.

An arm or extension, *a′*, at the upper end of the casing A, projects at right angles to the longitudinal axis or bore of said casing. To the outer end of said arm *a′* there is jointed a hammer-arm, C, carrying at its inner end a hammer, *c*, which normally lies just over the bore of the casing A, at its butt-end, the object of which is, that when raised and tripped the said hammer, which is a rocking or vibrating one, moving in the arc of a circle, may be forced down to give a blow upon the butt-end of the tool-holder B, projecting from said casing.

The hammer is held down upon the upper end of the casing by a U-shaped spring, D, and this spring is the impelling-spring of the rocking hammer. One end, *d*, of said spring is fastened to the extension-arm *a′* of the casing, while the other end, *d′*, is fitted to press upon the outer or upper surface of the hammer-arm C, this end *d′* of the spring being capable of sliding upon the said hammer-arm when the hammer is rocked upon its pivot to give a blow. Said impelling-spring D has a curved plate, E, secured to it at its outer curved side, and a set-screw, *e*, works through an opening in said plate, so as to bear upon the branch of the spring which fits the hammer-arm, for the purpose of varying the tension or force of said spring, and thereby regulating the force of the blows delivered by the hammer.

The hammer is raised, uplifted, or rocked

upon its pivot against the tension of its impelling-spring by means of a pivoted latch or pawl, F, acted upon by a spring, *f*, to hold it to its work, the said pawl engaging with a lug or projection, *c'*, on the face of the hammer *c*. The said pawl is pivoted to a sliding cup or thimble, G, on the outside of the casing A, and the said cup is connected with the tool-holder B by means of a connecting screw or pin, *g*, which passes through the cup, as well as through a longitudinal slot, a^2, in the casing, into a transverse socket or opening, *b'*, in the tool-holder.

With the end of the plugging-point against a resisting filling or tooth, pressure on the casing causes said casing to move endwise on the tool-holder toward its front end, which movement is permitted by the longitudinal slot a^2 in the casing. During the endwise movement of the casing on the tool-holder the hammer is held uplifted, raised, or away from the casing, owing to the engagement of the end of the pawl F with the lug or projection *c'* on the face of the hammer. As the casing reaches the end of its movement the butt-end of the tool-holder is exposed beyond its end, ready to receive the blow of the hammer when tripped or released from the holding-pawl, which release is accomplished at the moment the butt-end of the holder is protruded from the butt-end of the casing, owing partly to the movement of the hammer on its pivot in the arc of a circle and partly to the action of the inclined surface of the pawl next the casing, the pawl being guided and kept in position laterally by suitable studs of the extension-arm, between which the pawl works.

As soon as the hammer-lug and the holding-pawl are disengaged the hammer is forced quickly upon the butt-end of the holder and gives its blow.

When the blow is delivered the downward pressure upon the casing should cease, and said casing will then automatically be raised by the action of a spiral spring, H, fitted within the cup G, connected with the tool-holder, as before mentioned, said spring acting at one end against a shoulder, *h*, within the cup, and at the other against a shoulder, *h'*, formed upon the outside of the casing, or by the extension-arm *a'*, the range of movement of the casing on the tool-holder being limited by the end of the longitudinal slot a^2, formed in said casing, as before described. This action of the spring H brings the end of the pawl F again beneath the lug *c'* on the hammer *c*, in readiness for another actuation of the instrument, owing to the outward movement of the casing on the tool-holder, the casing in its said movement carrying the hammer with it, and the pawl yielding for the passage of the hammer-lug past it.

At the nose of the hard-rubber finger-piece or thimble *a* is a spring-button, I, carrying a pin, *i*, which passes through an opening in the casing and engages, when depressed by the finger, with an annular recess or groove formed in the tool-holder, the object of which is to render the tool-holder and casing rigid, so that the tool may be used as a pressure-plugger.

I do not broadly claim a spring so organized with a mallet-plugger as to separate the hammer and tool-holder after the blow is struck, so as to bring the parts into position for a new blow, as such organization is shown in Letters Patent No. 58,133 and No. 58,257, granted, respectively, to Chandler Poor and Chauncey M. Hooker in 1866; nor do I claim the spring-button arrangement at the nose of the casing, which adapts the instrument for use as a pressure-plugging tool, as that is not my invention, it being an old instrumentality for the purpose; nor do I claim to be the progenitor of the type of mallet-pluggers to which my improvements especially belong, as instruments which are made to give their blows to impact the fillings of teeth by pressure upon the point of the tool have long been in common use; nor do I broadly claim an instrument of the class to which mine belongs having in its organization a rocking or vibrating hammer raised and tripped by a lifting pawl or catch and thrown down to give its blow by an impelling-spring, as that is old. The organization, construction, and mode of operation, however, of my improved instrument is substantially different from anything which has preceded it, as far as I am aware.

It will, of course, be understood that the instrument is to be held in the hand in the usual manner—that is, somewhat after the manner of holding a pencil, the point of the plugging-tool being directed against the filling to be impacted.

I claim herein as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the casing, the tool-holder, the rocking hammer or mallet movable around its pivot, and the latch or pawl, connected with the tool-holder outside the casing, provided with an inclined or cam edge next said casing and acting directly upon a lug on said hammer to hold it uplifted as the casing is moved downward over the tool-holder, whereby said latch is disengaged from said lug to allow the hammer to strike its blow partly by the movement of the hammer in the arc of a circle and partly by the action of the cam edge of the latch upon the casing of the instrument.

2. The combination, substantially as hereinbefore set forth, of the casing, the tool-holder, the rocking hammer or mallet, the lifting-lug on said hammer, the impelling-spring, and the latch or pawl outside the casing, which acts directly upon said lifting-lug to hold said hammer away from the tool-holder until tripped to permit the hammer to give its blow.

3. The combination, substantially as herein-

before set forth, of the casing, the extension or arm thereof, the hammer-arm pivoted to said extension, and the U-shaped impelling-spring fixed at one end and acting upon the said hammer-arm at the other, with the capacity of sliding slightly upon said arm to accommodate its rocking movements.

4. The combination, substantially as hereinbefore set forth, of the rocking hammer, the bent impelling-spring, and the plate and set-screw carried thereby, for adjusting the tension or power of said spring.

In testimony whereof I have hereunto subscribed my name.

ELI T. STARR.

Witnesses:

GEORGE P. MORGAN,

WILLIAM H. GILBERT.