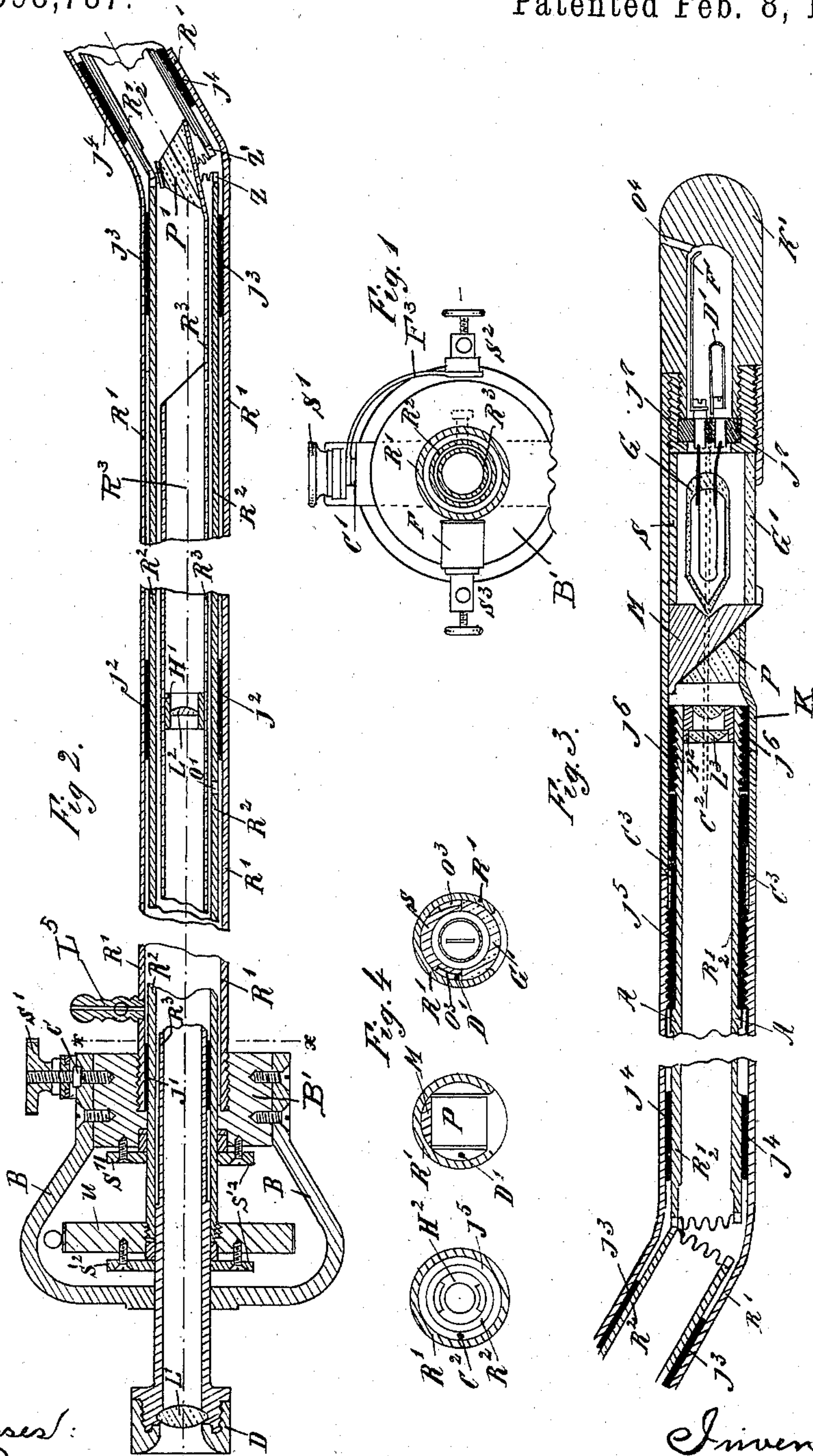


(No Model.)

G. E. KELLING.  
BENT ROTATABLE GASTROSCOPE.

No. 598,787.

Patented Feb. 8, 1898.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORG EMIL KELLING, OF DRESDEN, GERMANY.

## BENT ROTATABLE GASTROSCOPE.

SPECIFICATION forming part of Letters Patent No. 598,787, dated February 8, 1898.

Application filed March 20, 1897. Serial No. 628,491. (No model.)

*To all whom it may concern:*

Be it known that I, GEORG EMIL KELLING, of Dresden, in the Kingdom of Saxony, in the German Empire, have invented a new and useful Bent Rotatable Gastroscope, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to surgical instruments, and is an improved gastroscope or instrument for visually inspecting interior parts of the body, especially the human stomach; and it consists in the novel construction and combination of parts hereinafter described and claimed.

With the medical devices or gastroscopes heretofore devised for visually inspecting the stomach of a living human being, complete examination and inspection of the stomach in all its parts was impossible. With the old straight gastroscope the pylorus cannot be inspected, as it is situated in the upper bent region of the stomach, and, moreover, such straight apparatus touches the back membrane of the stomach, which in consequence cannot be inspected. The bent gastroscopes heretofore devised have to be duplicated for the right and left half of the stomach, and not even with these could the lower part nor the back part of the stomach be inspected. This invention avoids these inconveniences and produces an adjustable rotatable gastroscope which allows of the inspection of all parts of the stomach.

In the annexed drawings the new invention is shown.

Figure 1 represents a section on  $xx$  of Fig. 2. Fig. 2 is a longitudinal section through the greater portion of the apparatus. Fig. 3 is a longitudinal section through the illuminating portion of the apparatus, and Fig. 4 represents transverse sections of Fig. 3.

The outer casing  $R'$  of the instrument is preferably a metallic tube bent as indicated in the drawings, so as to adapt it to be more readily inserted into the stomach, the upper end of said casing being attached to a head-block  $B'$ , of insulating material, provided with a bow  $B$ , which serves as a handle for the instrument. Within the upper straight part of the casing is a smaller tube  $R^2$ , which projects through a stuffing-box  $S''$  on the head-

block and is provided with a finger-piece  $u$ , by which it can be rotated. The inner end of tube  $R^2$  is provided with teeth  $Z$ , meshing with teeth  $Z'$  on the upper end of another tube  $R'^2$ , which projects slightly beyond the end of casing  $R'$ , and on it is secured a hollow rotatable head-section  $K$ , which is insulated from tube  $R'^2$ , however, by an interposed insulating-ring  $j^6$ , as shown in Fig. 3. Tube  $R'^2$  is insulated from the casing by rings  $j' j^2 j^3$ , Fig. 2, and tube  $R'^2$  is insulated therefrom by rings  $j^4 j^5$ , as indicated in Fig. 3, these tubes being preferably lacquered between the insulating-rings.

Within tube  $R^2$  is a smaller pipe  $R^3$ , which projects through a stuffing-box  $S'^2$  on the key-piece  $u$  and through a suitable opening in bow  $B$ , and has in its outer end an object-glass  $L'$ , secured by a removable cap  $D$ . The inner end of said tube is provided with a tongue  $R'^3$ , which extends to the junction of tubes  $R^2 R'^2$  and supports a prism  $P'$ , as shown in Fig. 2. Tube  $R^3$  is preferably non-rotatable.

Within head-section  $K$  is an incandescent lamp  $G$ , which is located between a sight-glass  $G'$  in one side of said head-section and a mirror  $S$  opposite said glass. Above the lamp is a mirror  $M$ , by which the objects visible through glass  $G'$  are reflected into a prism  $P$ , by which the rays of light are directed axially through tube  $R'^2$  to the prism  $P'$ , by which the rays are directed axially to the object-glass  $L'$ .

To magnify the object, lenses  $L^3$  and  $L^2$  may be employed, the former being located in a ring  $H^2$ , secured in tube  $R'^2$  near prism  $P$ , and the latter being secured in a ring  $H'$ , secured in tube  $R^3$ , as shown.

Current is supplied to lamp  $G$  as follows: On head-block  $B'$  are opposite set-screws  $S^2 S^3$ , and the positive wire is connected to  $S^3$  and the current conducted through contact-spring  $F$  to the casing  $R'$ , along which it is carried to the head-section  $K$ , a conducting ring or strip  $C^3$  being located at the junction of the casing and head-section to facilitate the passage of the current. In the head-section the current is directed through a spring  $F'$ , arranged in the hollow head  $K'$  of the section, to one terminal of the lamp-filament, while the other terminal of the filament



is connected to a wire D', which in turn connects with a wire C<sup>2</sup>, insulated from the head K' and head-section, but contacting with the inner end of tube R<sup>2</sup>, through which the current flows to tube R<sup>2</sup>, and thence through pipe R<sup>3</sup> and bow B to a variable contact S', and thence through the contact-spring F<sup>3</sup> to the binding-post S<sup>2</sup>. Thus the casing and tubes are made to act as conductors for the electric current.

Air can be admitted through the valve L<sup>5</sup> into the casing, the rings  $j' j^2 j^3 j^4 j^5$ , mirror M, and plug  $j^8$  being suitably notched to allow it to pass on into the hollow head K', whence it enters the stomach through opening O<sup>4</sup>, or other suitable air-passages may be provided, so as to allow the air to freely circulate to head K', the stuffing-boxes S'' S'<sup>2</sup> preventing it escaping externally.

From the foregoing description and drawings it will be understood that after insertion of the instrument the head-section can be rotated so as to direct the rays of light into any part of the stomach, and that the latter can be expanded by compressed air, so as to facilitate the inspection thereof.

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

1. In a gastroscope, the combination of the casing, having a rotatable head-section; and an illuminating device in said head-section; with means for rotating said section while inserted in the stomach, for the purpose and substantially as described.

2. In a gastroscope, the combination of the casing, the mirror and lenses therein, and passages for conducting air into the stomach to expand the same when the instrument is inserted in the stomach, substantially as described.

3. In a gastroscope, the combination of the casing, a rotatable head-section, reflecting lenses and mirrors, and means for rotating said head-section while inserted in the stomach, substantially as and for the purpose described.

4. In a gastroscope, the combination of the casing having a rotatable head-section, and an illuminating device in said head-section; with means for rotating said section while inserted in the stomach; and means for injecting air through the gastroscope to expand the stomach, substantially as described.

5. In a gastroscope, the combination of the casing, a rotatable head-section, reflecting

lenses and mirrors, and means for rotating said head-section while inserted in the stomach; and an electric incandescent lamp in said head-section, substantially as described.

6. In a gastroscope, the combination of the casing, the mirror and lenses therein, and passages for conducting air into the stomach to expand the same when the instrument is inserted in the stomach; with an electric lamp in the inner end of said gastroscope, substantially as described.

7. In a gastroscope, the combination of the casing, an electric lamp therein electrically connected therewith, with a tube within the casing electrically insulated therefrom, but electrically connected to the lamp, and electrical connections between said tube and casing and an electrical supply, for the purpose and substantially as described.

8. In a gastroscope, the combination of the outer bent casing having a rotatable head-section and an electric lamp in said section; with the rotatable tubes in said casing electrically insulated therefrom, said casing and tubes forming conductors for the electric current, substantially as described.

9. In a gastroscope, the combination of the casing, the rotatable head-section, the lamp in said head-section having one terminal electrically connected to the casing; the insulated rotatable tubes in said casing electrically connected with the other lamp-terminal; the fixed pipe in the inner tube, the mirrors, prisms and lenses, substantially as described, and the insulating-supports for the outer ends of said casing and tubes, and the binding-posts on said supports, all substantially as and for the purpose described.

10. In a gastroscope, the combination of the outer bent casing, having a rotatable head-section, and an electric lamp in said section; with the rotatable tubes in said casing electrically insulated therefrom, said casing and tubes forming conductors for the electric current; the non-rotatable pipe in the outer tube, the object-glass, lenses, prisms, and reflectors, arranged substantially as described, and means for conducting air through the gastroscope to expand the stomach, all substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORG EMIL KELLING.

Witnesses:

HERNANDO DE SOTO,  
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