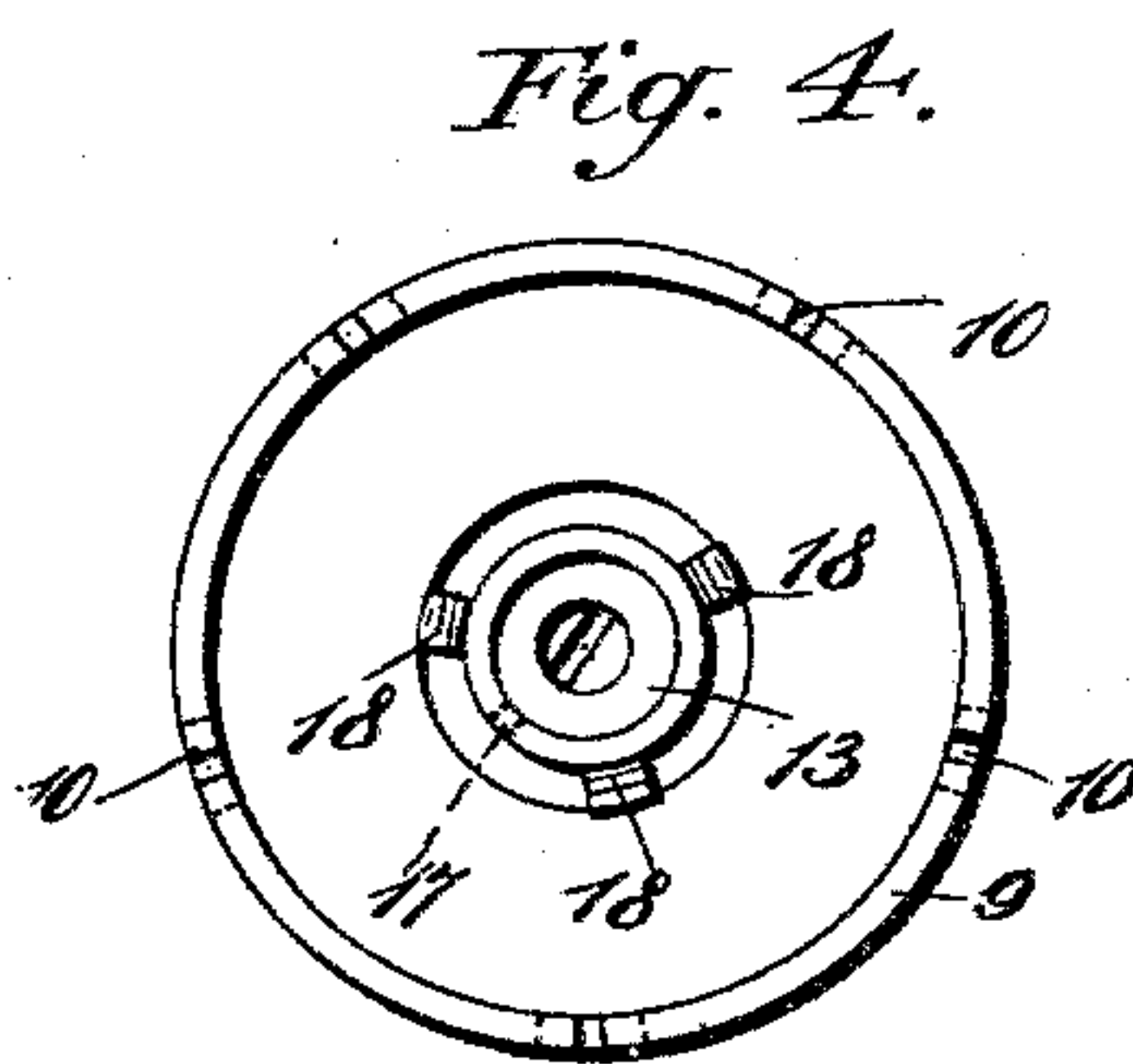
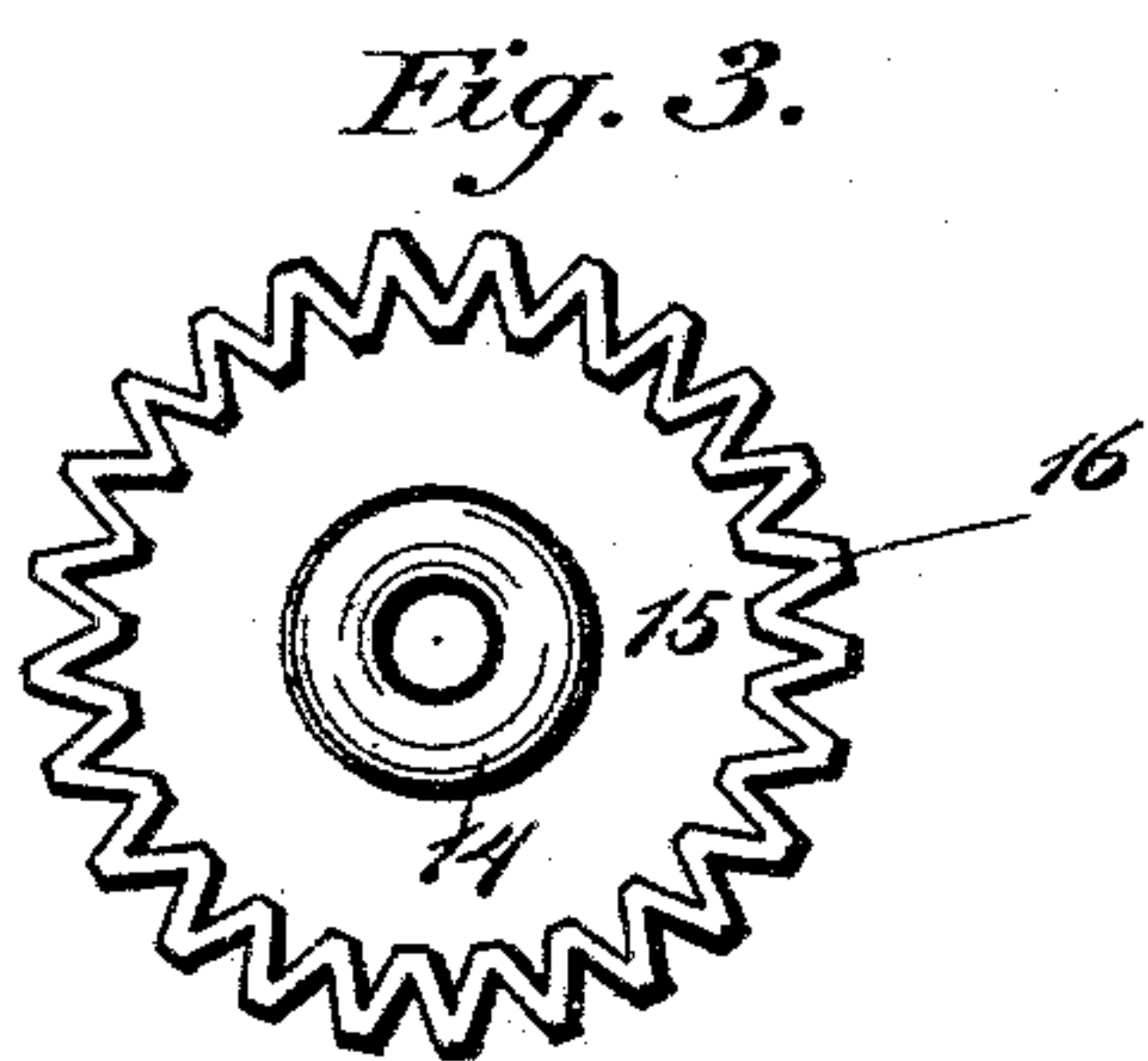
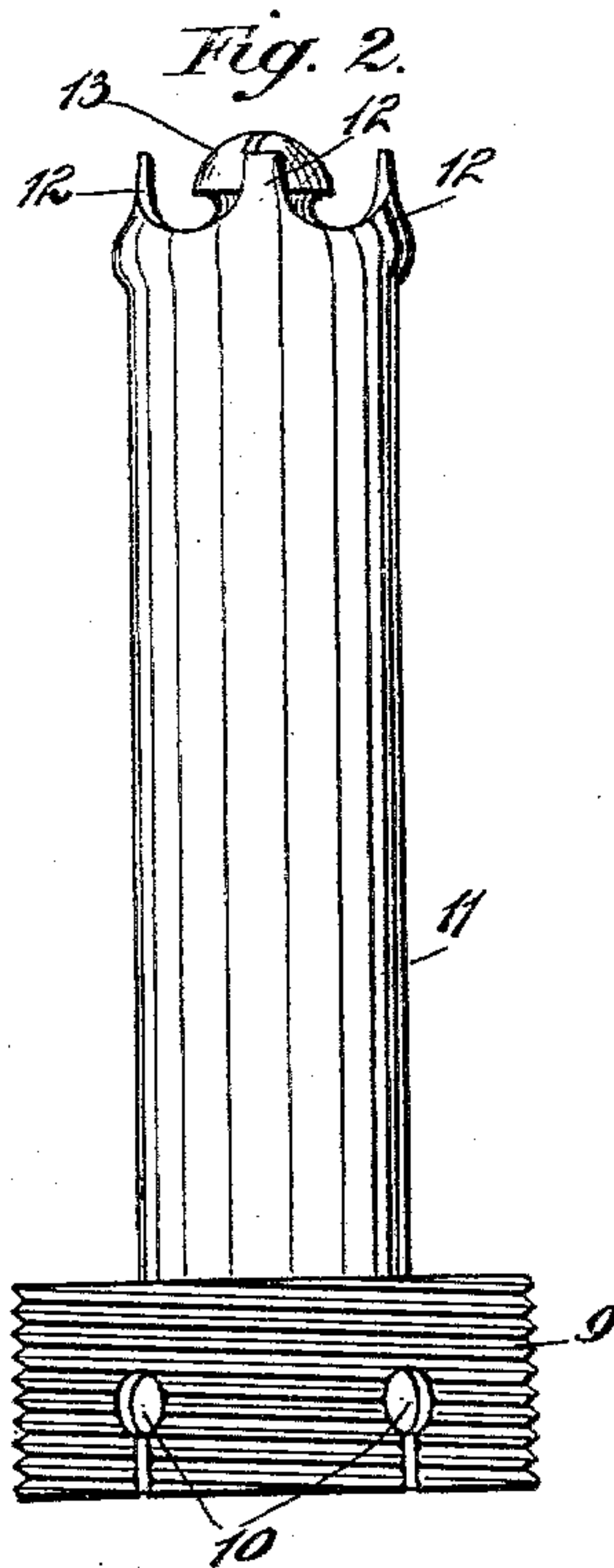
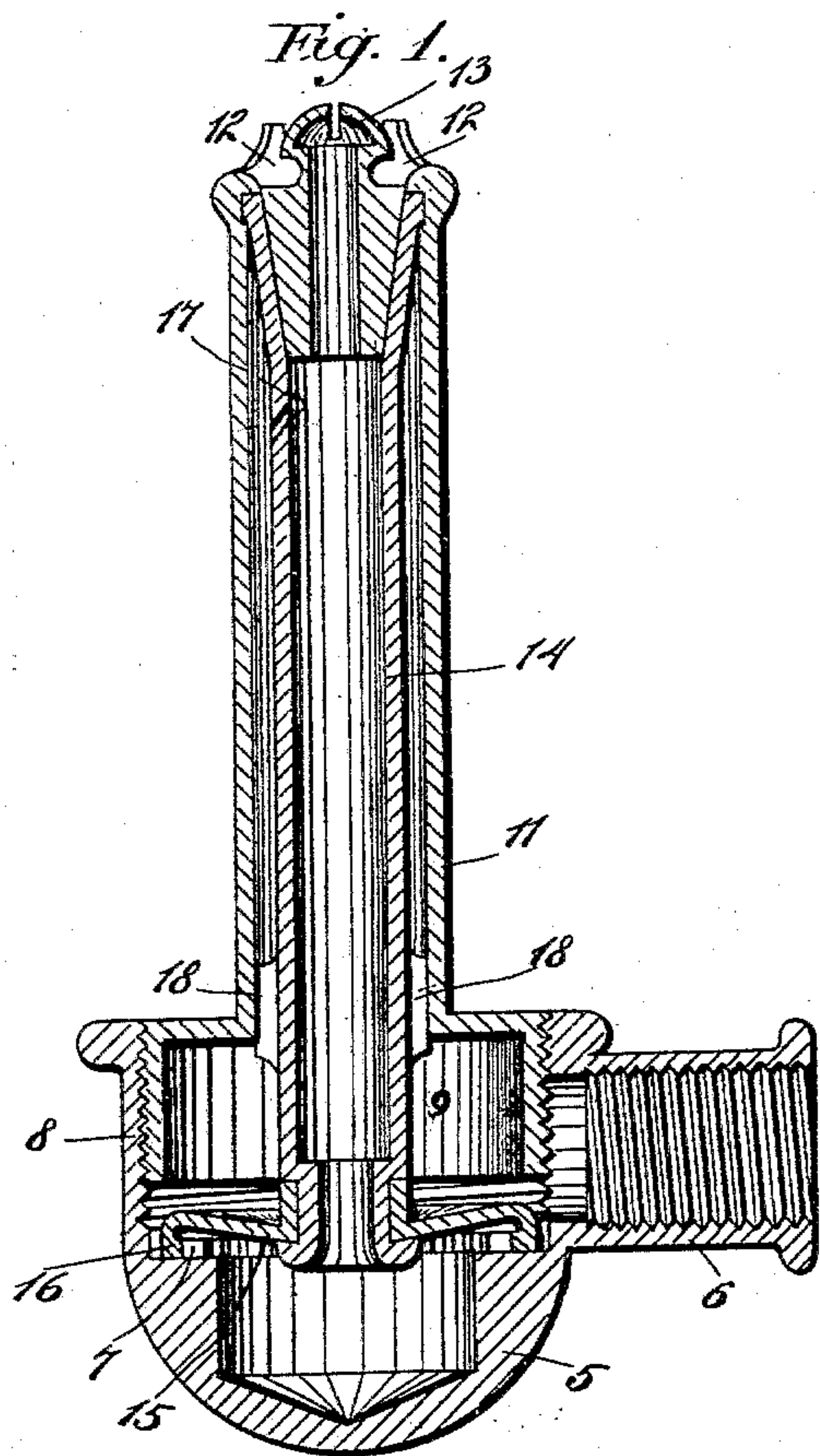


(No Model.)

G. I. WOOLLAVER.  
GAS BURNER.

No. 598,047.

Patented Jan. 25, 1898.



WITNESSES:

*Otto Spieth.*  
*Isaac B. Wray*

INVENTOR

*G. I. Woolaver.*

BY

*Wm. H. Wray*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

GEORGE INGRAM WOOLAVER, OF QUINCY, MASSACHUSETTS.

## GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 598,047, dated January 25, 1898.

Application filed June 21, 1897. Serial No. 641,658. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE INGRAM WOOLAVER, a subject of the Queen of Great Britain, residing at West Quincy, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Gas-Burner, of which the following is a full, clear, and exact description.

This invention is a gas-burner of that kind which utilizes the property of expansion and contraction in metals to regulate the flow of the gas. The invention is designed particularly to stop or nearly stop the flow of gas when the flame is put out.

This specification is the disclosure of one form of my invention, while the claims define the actual scope of the conception.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical section of the burner. Fig. 2 is an elevational view of the expansion-tube. Fig. 3 is a bottom view of the valve, and Fig. 4 is a bottom view of the expansion and gas-conducting tubes having the valve removed therefrom.

The casing or body 5 of the burner has a nipple 6, that leads from the gas-supply. The interior of the casing 5 has a horizontal valve-seat 7 and an internally-threaded portion 8 upward from said valve-seat. Screwed into the internally-threaded portion 8 is a barrel 9, having slots 10 therein, as shown in Fig. 2. These slots make the barrel yielding and permit it to expand against the inside of the portion 8 of the casing 5.

Standing on the upper head of the barrel 9 is the expansion-tube 11, the upper extremity of which is provided with projected portions 12, surrounding the tip 13 of the burner, so that the heat from the flame at said tip will be intercepted and absorbed by the projections 12, and thus transmitted to the main portion of the expansion-tube 11, which tube should be constructed of some highly-expandible material, such as brass. The upper end of the expansion-tube 11 is provided with a groove receiving the enlarged upper end of the gas-conducting tube 14. Within the enlarged upper end of this tube 14 is contained the burner-tip 13. As the tube 11 contracts and expands under the influence of the flame

at the tip 13 the tube 14 is moved vertically. Attached to the lower extremity of the tube 14 is a disk valve 15, the face 16 of which has the serpentine form illustrated in Fig. 3 and bears on the valve-seat 7 of the casing 5. The upper portion of the tube 14 has a small opening or by-pass 17. The tube 14 is guided in the tube 11 by means of ribs 18, projecting outward from the lower portion of the tube 14 and bearing against the inner face of the tube 11. The tube 14 should be constructed of steel or other comparatively non-expansive metal.

Gas under pressure in the nipple 6 passes into the casing at a point above the valve 15, and from this point the gas passes up between the tubes 11 and 14 and enters the tip 13 by way of the by-pass 17. A small quantity of gas will now escape through the tip 13 and may be ignited. This done, the heat of the flame at the tip 13 will be absorbed by the projections 12 and thence transmitted to the main portion of the tube 11. Upon this action the tube 11 expands longitudinally, lifting with it the tube 14, which has comparatively no expansion. This raises the valve 15 and permits a large volume of gas to pass beneath said valve and thence up through the tube 14 to the tip 13. When the flame is extinguished, the tube 11 becomes cool and is contracted, thus throwing down the valve 15 and completely closing the burner, excepting the small passage 17, from which gas will not pass in quantities sufficient to cause either asphyxiation or an appreciable waste of gas.

It is intended to use the burner with the usual cock; and the purpose of the invention is to guard against accidents by attempted suicide or by the careless use of the main gas-cock.

Various changes in the form, proportion, and minor details of my invention may be resorted to without departing from the spirit and scope thereof. Hence I do not consider myself limited to the precise construction herein shown, but believe that I am entitled to all such variations as come within the terms of my claims.

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

1. The combination of a casing or body por-



tion, an expansion-tube standing on said casing or body portion, a gas-conducting tube having its upper end attached to the expansion-tube, the gas-conducting tube being run  
5 through the expansion-tube and having a by-pass therein, a tip held in the upper end of the gas-conducting tube, and a valve attached to the lower end of the gas-conducting tube and seating on the interior of the casing.

10 2. The combination of a casing, an expansion-tube standing on the casing, the expansion-tube having projections running upward from its upper extremity, a gas-conducting tube contained within the expansion-tube  
15 and connected with the upper end thereof, the gas-conducting tube having a by-pass therein, a tip held within the upper end of the gas-conducting tube, and a valve carried by the lower end of the gas-conducting tube and seating on the valve-casing.

20 3. The combination of a casing, having a nipple leading into the casing and having a valve-seat below the nipple, a barrel contained in the upper portion of the casing, an  
25 expansion-tube standing on the barrel, a gas-conducting tube run through the expansion-tube and held by the upper end thereof, the gas-conducting tube having a by-pass therein, a burner-tip contained in the upper end  
30 of the gas-conducting tube, and a valve carried at the lower end of the gas-conducting tube and moving toward and from the seat of the valve-casing.

4. The combination of a casing or body portion, an expansion-tube standing thereon, a  
35 gas-conducting tube attached to the upper end of the expansion-tube and extending through the expansion-tube, the gas-conducting tube having a by-pass therein, and a valve held by the lower end of the gas-conducting tube and seating on the casing or body portion.  
40

5. The combination of a casing or body portion having an inlet therein, and having a valve-seat below the inlet, a barrel screwed  
45 into the upper portion of the casing, an expansion-tube standing on the barrel and having projections run upward from its upper end, a gas-conducting tube run through the expansion-tube and having its upper end at-  
50 tached to the upper end of the expansion-tube, the gas-conducting tube having a by-pass therein, a burner-tip held within the upper end of the gas-conducting tube, lugs projecting outward from the sides of the gas-con-  
55 ducting tube and engaged with the inner sides of the expansion-tube, and a valve attached to the lower end of the gas-conducting tube and coacting with the seat of the casing or body portion.

GEORGE INGRAM WOOLLAVER.

Witnesses:

EDWARD E. HAYDEN,  
W. F. WEST.