

No. 771,144.

PATENTED SEPT. 27, 1904.

J. D. GOULD.
THERMOSTAT.

APPLICATION FILED MAY 19, 1903.

NO MODEL.

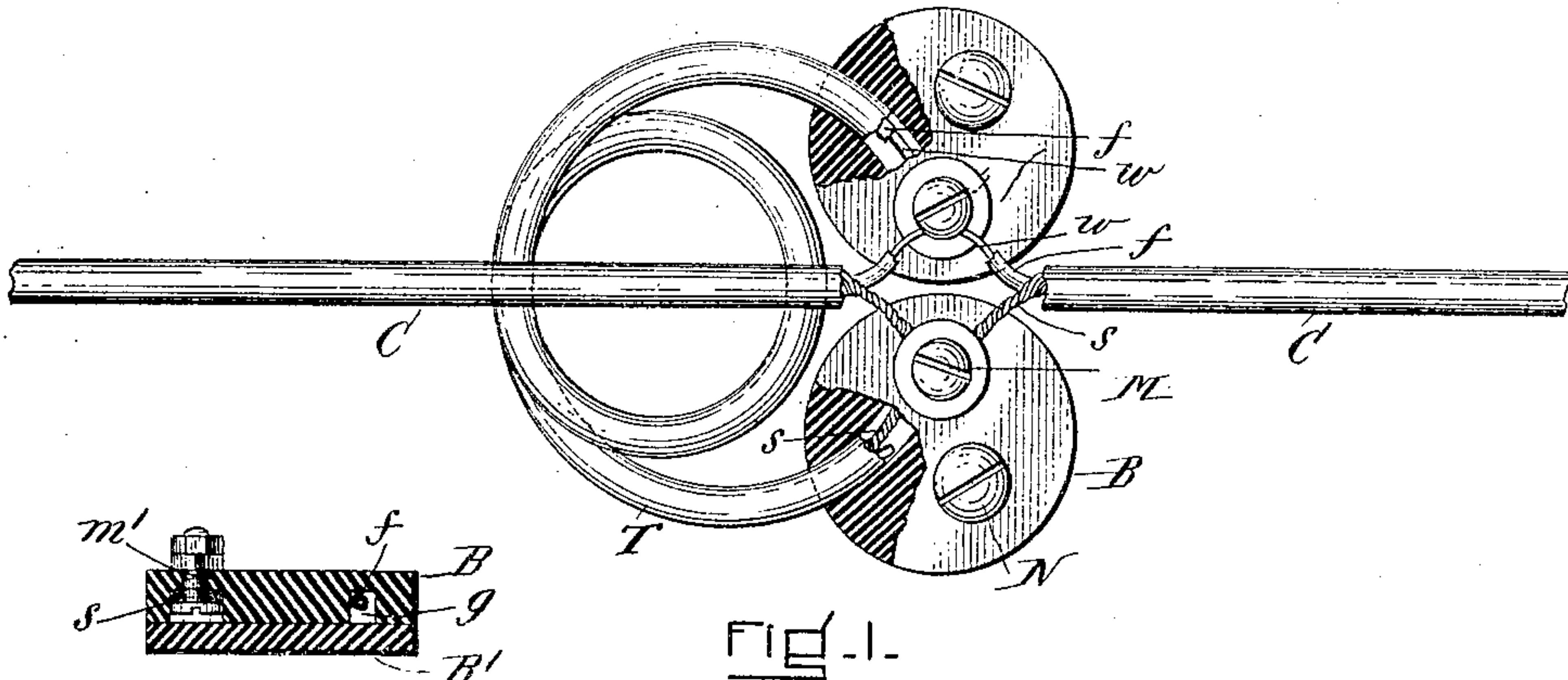


Fig. 2.

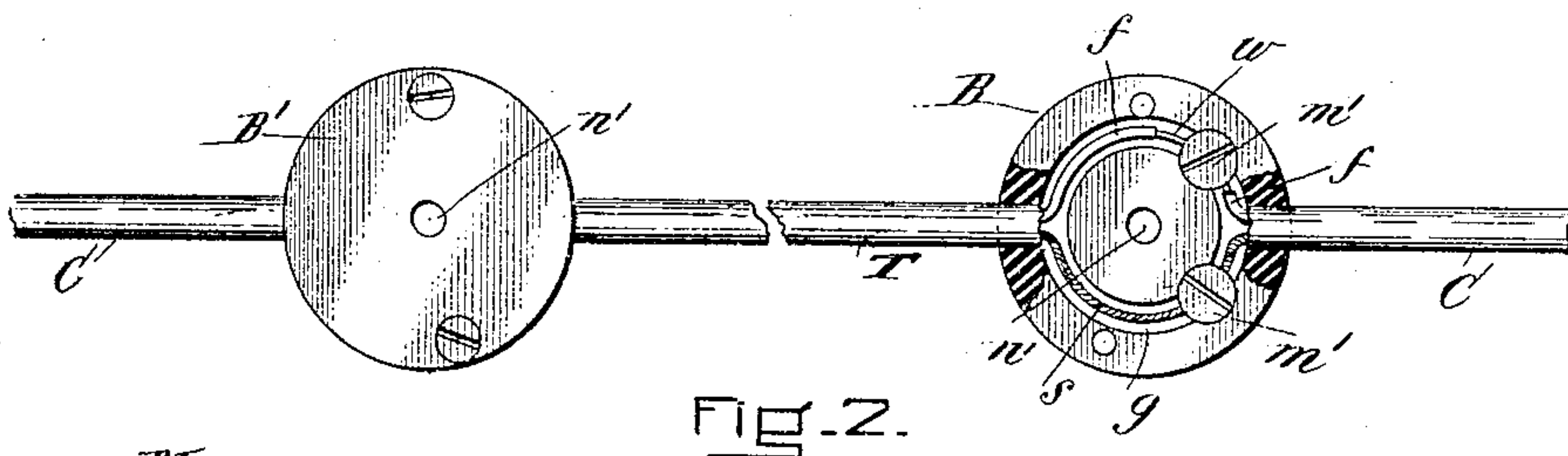


Fig. 3.

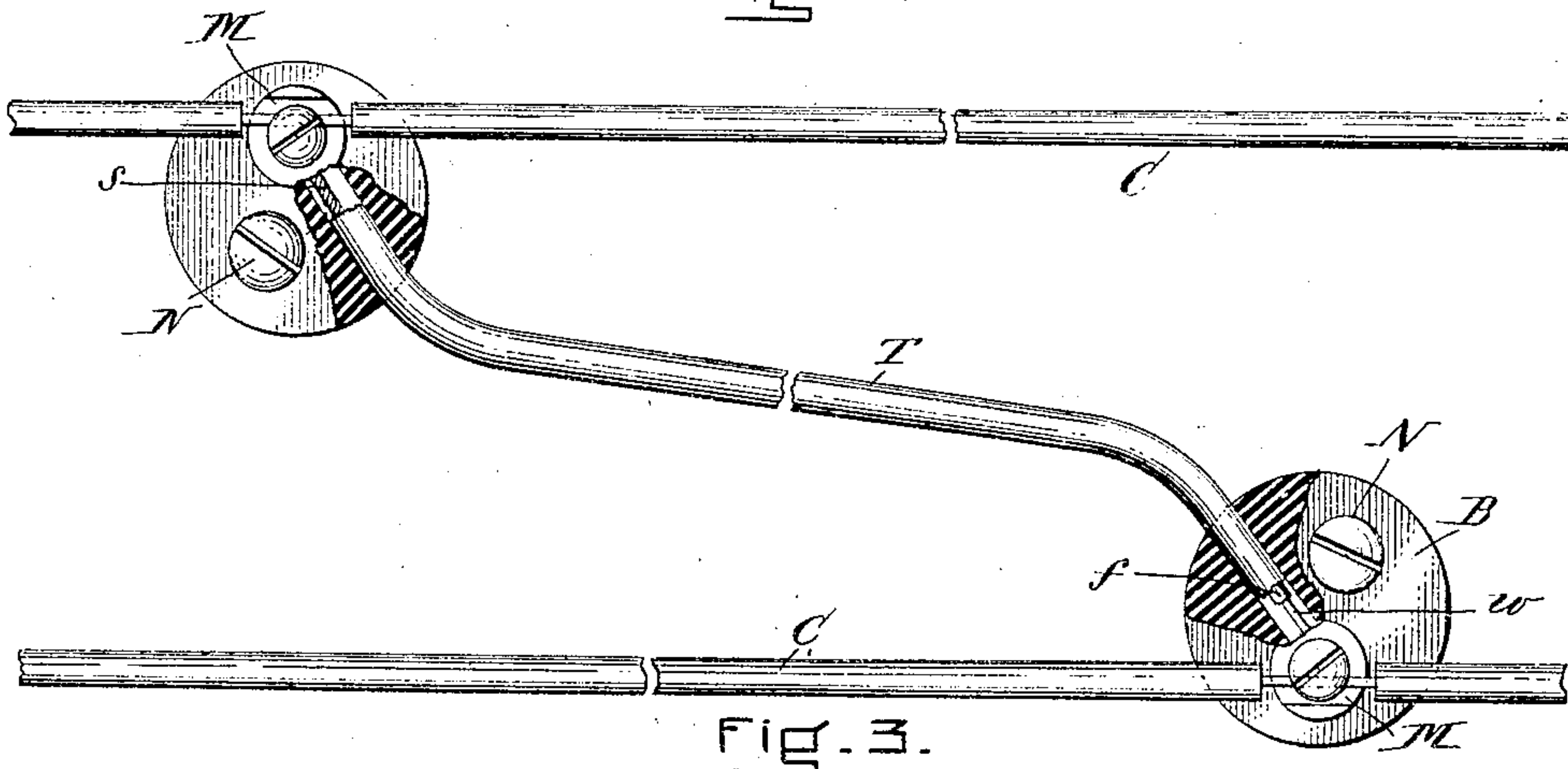


Fig. 4.

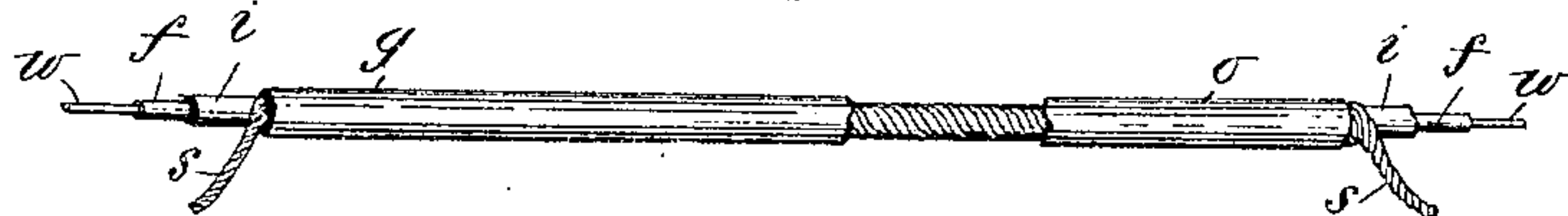
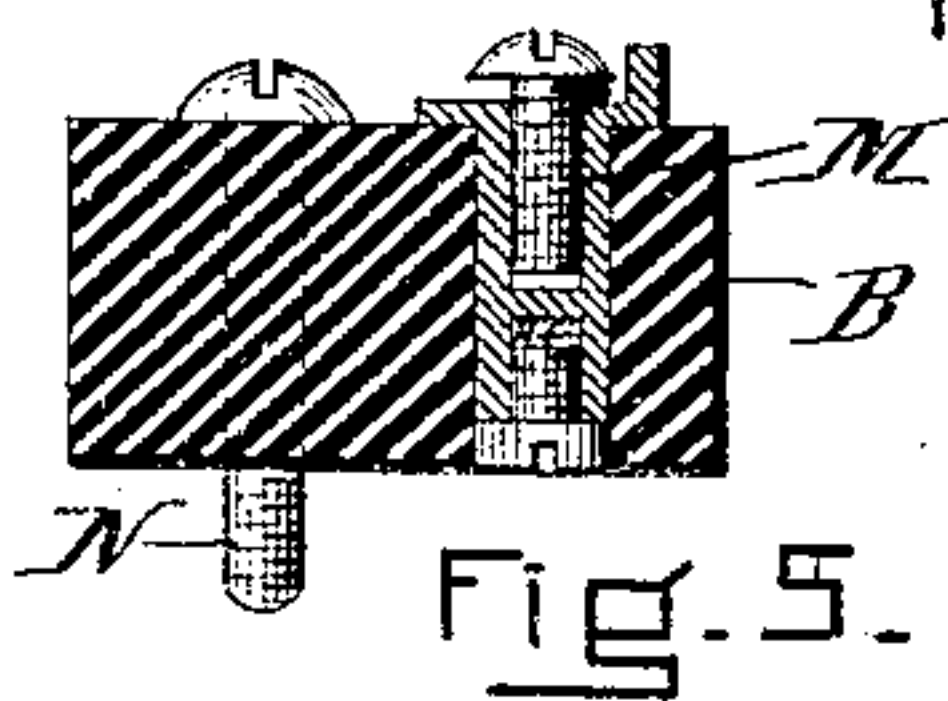


Fig. 5.

WITNESSES:
Frank G. Parker.
G. A. Collins



INVENTOR:
John D. Gould,
By Reuben L. Roberts,
Atty.

UNITED STATES PATENT OFFICE.

JOHN D. GOULD, OF NEW YORK, N. Y.

THERMOSTAT.

SPECIFICATION forming part of Letters Patent No. 771,144, dated September 27, 1904.

Application filed May 19, 1903. Serial No. 157,761. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. GOULD, a citizen of the United States of America, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Thermostats and Their Employment with Fire-Alarm Circuits, of which the following is a specification.

The invention relates to thermostats and their combination with automatic fire-alarm or fire-detecting circuits.

The preferable construction of thermostatic cable for use in this improvement is that shown and described in Letters Patent No. 565,178 or No. 565,217, each dated August 4, 1896, wherein the core is an electric conductor, such as copper wire, combined with a wire or envelop of so-called "fusible" metal—that is, a single metal or an alloy which will fuse at low temperatures, as compared with the fusing-point of copper—and an outer electric conductor of copper or brass wire insulated from the inner or core conductor, this outer member of the cable being preferably of fine wire twisted about the insulating-covering of the inner member for the purpose of giving the cable flexibility. When a cable of this character is run about in a building and has its two members connected in circuit with an electric battery and alarm-bell, it will serve as a thermostat, for as soon as the temperature at any part of the cable becomes sufficiently high to melt the fusible metal it will expand and be forced through the insulating-covering and make electrical connection between the inner and outer conductors or members of the cable, and thus close the circuit. As there is greater difficulty and expense in constructing such cables with a metal having a very low fusing-point, it has been found advantageous to employ short sections of such cable as sensitive thermostats, in which the fusible metal used will melt at a temperature not greater, for instance, than 300°, and for many locations much below that. Such thermostats may be connected with circuits of the usual copper insulated wire or with

circuits of the said thermostatic cable in which the fusible metal used has a melting-point of 600° or even higher.

When short sections of such cable are used as thermostats, in which the fusible metal combined with the inner conductor has a very low melting-point and are subjected to a degree of heat sufficient to melt the fusible metal, it is found that there is liability and a tendency for such melted metal to move longitudinally of the inner conductor and to run out at the open end instead of being forced through the insulating-covering and making electrical connection with the outer conductor. To prevent this, the open ends of the sections of cable are inserted into blocks or pieces of suitable insulating material—hard rubber, for example—and the ends of the fusible metal members there sealed with some material which is not readily affected by heat, and in order to facilitate the connection and disconnection of the electrical conductors of these sections of cable with the alarm-circuit conductors the said insulating-blocks are provided with one or more metallic terminals, to each of which one of the conductors of the short thermostatic sections of cable and one of the circuit-conductors are connected. In practice it will be found convenient to connect the conductors of the short sections of cable with such metallic terminals interiorly of the insulating-blocks, while the circuit-conductors may be connected with those terminals exteriorly of said blocks.

When connecting the short thermostatic sections of cable with an alarm-circuit, in what may be termed "open branches"—that is, having one end only of each conductor of the short section normally connected with one of the circuit-wires—a single metallic terminal only will be needed in each insulating-block; but when the two conductors of each short section of thermostatic cable are connected in series with the two circuit-conductors it will be found convenient and economical to have two metallic terminals in each insulating-block.

In the drawings forming a part of this speci-

fication, Figure 1 illustrates the insulating-blocks, each provided with a single metallic terminal, to each of which is connected as an open branch one conductor of the short coiled section of thermostatic cable which has a fusible member of relatively low fusing-point, as also one conductor of the alarm-circuit which consists of long sections of similar cable, the fusible members of which, however, have a relatively higher fusing-point than that of the short sections. Fig. 2 illustrates insulating-blocks viewed from the reverse side to that shown in Fig. 1 and each provided with two metallic terminals to which similarly-constructed short and long sections of thermostatic cable are connected in series. Fig. 2^a is a section through the block and terminal shown in Fig. 2. Fig. 3 illustrates insulating-blocks like those shown in Fig. 1 with conductors of the short sections of cable connected to the metallic terminals the same as in Fig. 1, but with the thermostatic section extending between two ordinary copper circuit-conductors. Fig. 4 illustrates the construction of the thermostatic cable which, preferably, is employed. Fig. 5 illustrates a convenient form of insulating-block and metallic terminal therein.

Designating by letters the several parts shown in the drawings, C represents the alarm-circuits; T, the short thermostatic sections; B, the blocks of insulating material; M, the metallic terminals in the blocks. The thermostatic cable is composed of an inner wire *w*, an enveloping fusible member *f*, an insulating-covering *i*, a series of small wires *s*, preferably wound spirally about the covering *i*, and an outside insulating-covering *o*.

When arranged, as shown in Figs. 1 and 3, within one of the blocks B, where the ends of the sections T are inserted, a short portion of the end of the conductor *s* is cut off. The fusible metal *f* is removed from the end of the wire *w* for a short distance and the end of the fusible metal covered and sealed with some suitable insulating material which is not readily effected by heat—such as plaster, shellac, &c.—in order to prevent the flow of the fusible metal longitudinally of the wire *w* when the fusible metal is melted and the end of the wire *w* is connected with the terminal M. In the other block a short piece of the end of the wire *w* and fusible metal *f* is cut off and sealed and the end of the conductor *s* is connected with the terminal M in that block.

When arranged as shown in Fig. 2, each end of each wire *w* is connected with a metallic terminal *m'* in a block at the junction of each two sections of the alarm-circuit, and each end of each conductor *s* is connected with the other metallic terminal in the respective blocks. A simple and convenient terminal is illustrated in the sectional view in Fig. 5,

where the several wires may be connected therewith by screws, as shown.

In Fig. 2 the block B is made in two parts, as shown in section in Fig. 2^a. In the upper part an annular groove *g* is formed to contain the electric conductors, and their ends are connected with the terminals indicated by the screw-heads *m' m'* in the right-hand block of Fig. 2. This annular groove *g* and the terminals may be covered by a disk B' of insulating material, as shown in the left-hand block of Fig. 2. These blocks may be secured to the ceiling or wall by screws N, which screws, in the form shown in Fig. 2, may be inserted through a central hole *n'* in the block B.

I claim—

1. The combination with a thermostatic cable, which has a fusible member, of insulating-blocks into which the ends of the cable are sealed to prevent movement of the fusible member longitudinally of the cable, under the influence of heat, and metallic terminals carried by the blocks to which the cable is connected.

2. The combination with a thermostatic cable which has a member of readily-fusible metal, of insulating-blocks in which the ends of the cable are sealed to prevent movement longitudinally thereof, of the fusible member when melted, and one or more metallic terminals carried by the blocks to each of which a member of the cable is connected.

3. In combination with the wires of an electric circuit, sections of thermostatic cable consisting of two insulated conductors, one of which is of readily-fusible metal, insulating-blocks in which the ends of the thermostatic cable are sealed to prevent longitudinal flow therein of fused metal, metallic terminals carried by said blocks to each of which terminals one end of a member of a cable-section and one circuit-wire is connected.

4. The combination in a fire-alarm circuit of relatively short sections of thermostatic cable composed of two insulated members, one of which is of metal of relatively low fusing-point, long sections of thermostatic cable one member of which is of metal of relatively higher fusing-point, insulating-blocks in which the ends of the said short sections of cable are sealed, and metallic terminals in said blocks, each of which terminals is connected with one member of a long section of cable and each with one member of a short section of cable.

5. The combination in a fire-alarm circuit, of short sections of thermostatic cable composed of two insulated members one of each of which is of metal of relatively low fusing-point, and long sections of thermostatic cable one member of each of which is of metal of relatively higher fusing-point, and blocks of insulating material in each of which one end of a short section of cable is sealed, which

blocks are provided with metallic terminals, through which the corresponding members of the several successive sections of cable are respectively connected in series.

5 6. The combination with a thermostatic cable having a fusible member, of blocks or pieces into which the ends of the said cable are inserted to prevent movement of the fusi-

ble member longitudinally of the cable under the influence of heat, and terminals carried by 10 said blocks to which the thermostatic cable is connected.

JOHN D. GOULD.

Witnesses:

A. DELOS KNEELAND,
F. A. COLLINS.