

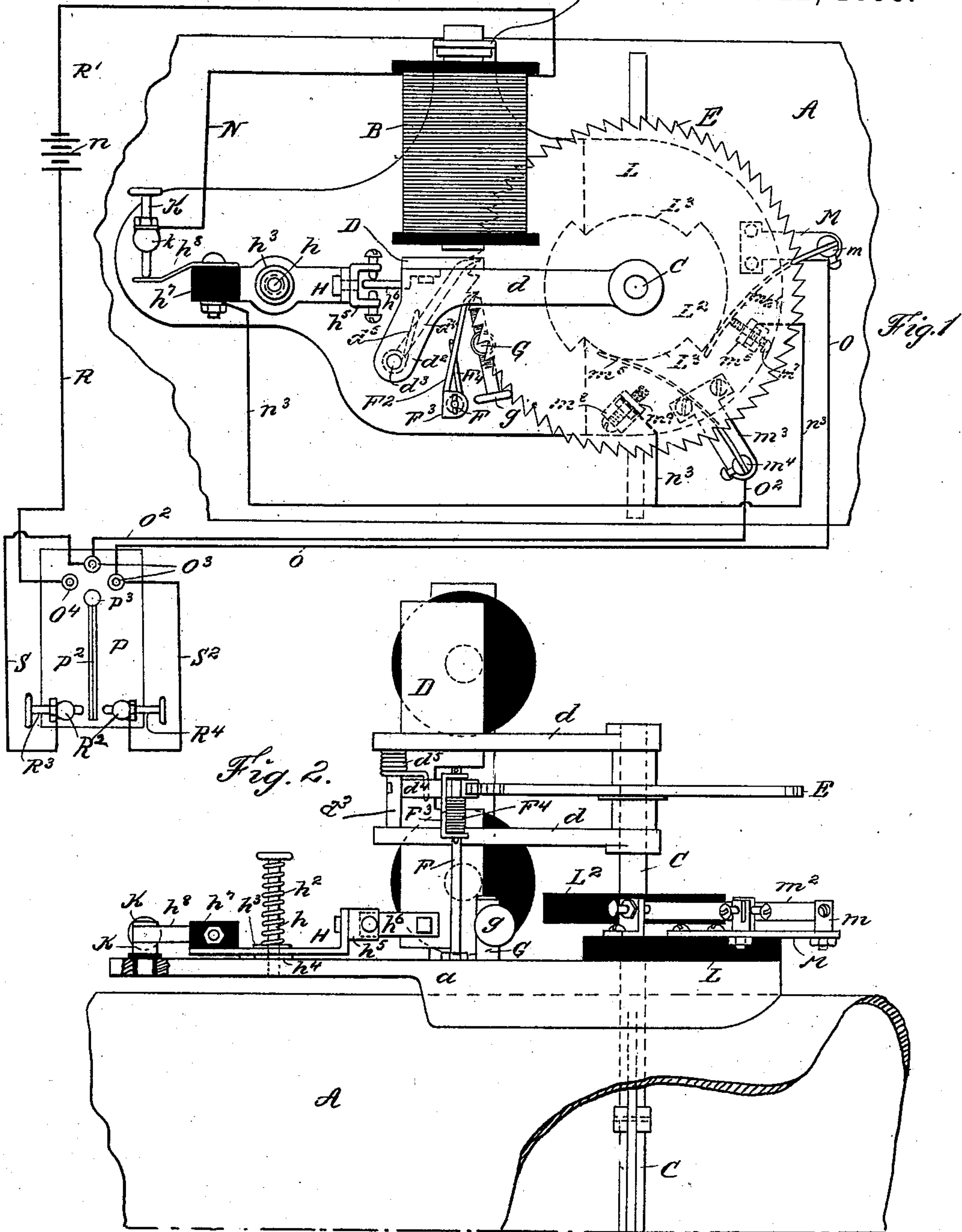
(No Model.)

2 Sheets—Sheet 1.

C. KUMMER & L. BERTRAND.
DAMPER GOVERNOR.

No. 600,966.

Patented Mar. 22, 1898.



WITNESSES:

6 Vordfon
C. Gerst.

INVENTORS.

Charles Kummer &
Lewis Bertrand.
BY
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ATTORNEYS.

(No Model.)

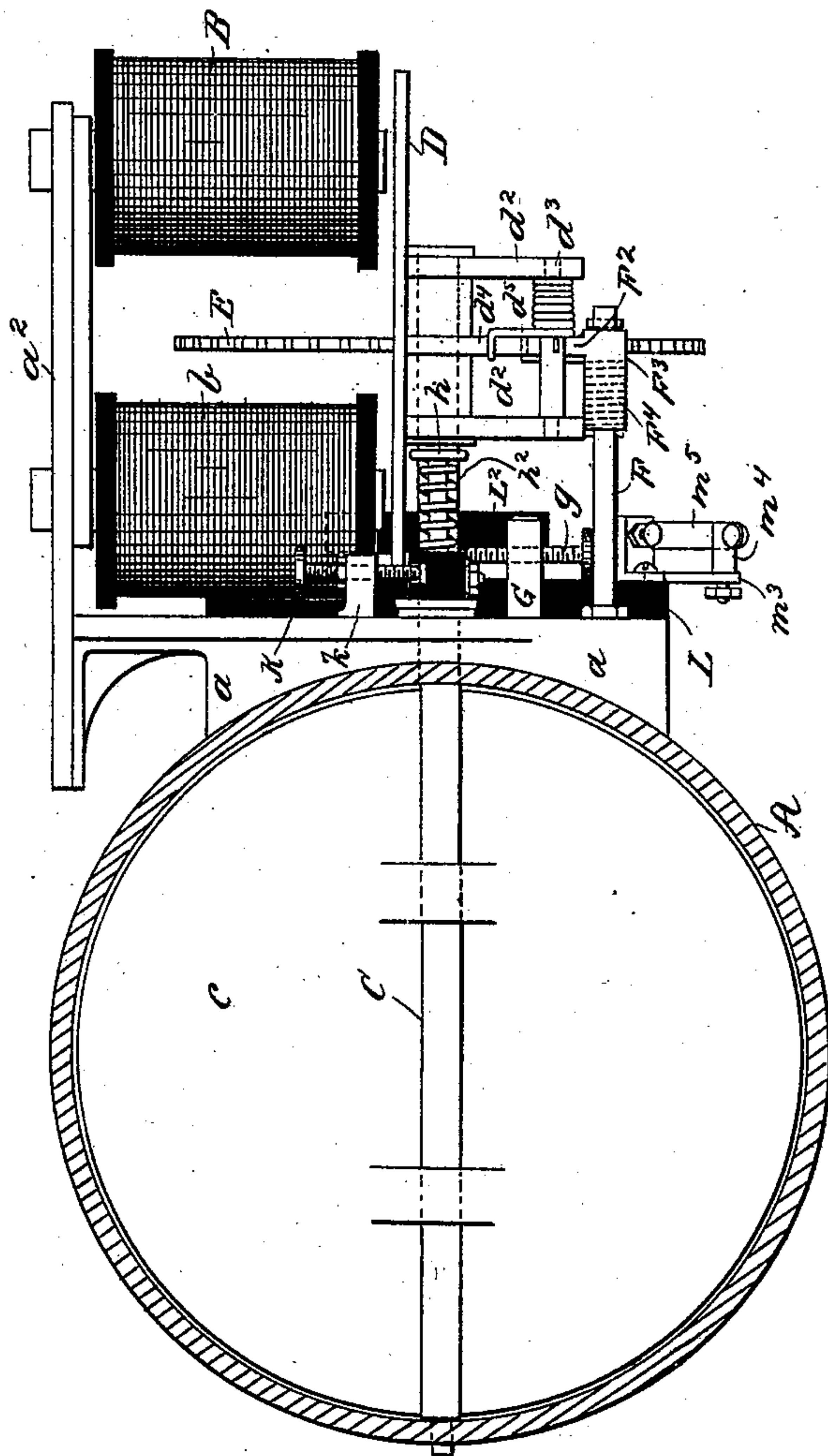
2 Sheets—Sheet 2.

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Fig. 3.



WITNESSES:

C. Nordfors
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INVENTORS

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UNITED STATES PATENT OFFICE.

CHARLES KUMMER AND LEWIS BERTRAND, OF EASTON, PENNSYLVANIA.

DAMPER-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 600,966, dated March 22, 1898.

Application filed May 9, 1896. Serial No. 590,940. (No model.)

To all whom it may concern:

Be it known that we, CHARLES KUMMER and LEWIS BERTRAND, citizens of the United States, and residents of Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Damper-Governors, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to dampers; and the object thereof is to provide an electrical apparatus for automatically operating dampers so as to control the temperature of a room or compartment in a building; and the invention consists in the combination, with a damper which is located in a pipe or flue, of an electrical apparatus connected therewith and a thermostat located in the room or compartment which is in electrical connection with said apparatus, said apparatus and thermostat being also in electrical connection with a battery.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a side view of the apparatus which we employ, showing also a section of a pipe and the battery and thermostat in connection with said apparatus; Fig. 2, a bottom plan view thereof, and Fig. 3 an end view thereof and showing a section of the horizontal arm of a pipe.

In the drawings forming part of this specification, A represents a section of the horizontal arm of a pipe or flue, and in the practice of our invention we provide a casting or plate a , which is secured to said pipe by screws or bolts or in any desired manner, and said plate is provided at its upper side with an outwardly-directed extension or arm a^2 , which projects at right angles thereto, and mounted on said arm or extension a^2 are two electromagnets B and b.

Passing centrally through the pipe A and through the plate or casting a is a shaft C, on which is placed or through which passes a damper c, which is adapted to turn with said shaft, and we also provide an armature D, which is provided with arms d , which are revolubly mounted on the shaft C, and formed

on said arms, adjacent to said armature, are supplemental arms d^2 , which project at an angle therefrom and the outer ends of which are connected by a rod d^3 , which is revoluble therein and which carries a pawl d^4 , which is operated by a spring d^5 , which is mounted on the rod d^3 , and the pawl d^4 operates in connection with a ratchet-wheel E, mounted on the shaft C, and secured to the plate or casting a is an arm or standard F, on which is mounted a pawl F^2 , having a cross-head F^3 , by which it is connected with said arm or standard, and mounted on said arm or standard is a spring F^4 , which bears upon the pawl F^2 and forces it in contact with the ratchet-wheel E, and the pawls F^2 and d^4 operate upon the ratchet-wheel E on the side thereof adjacent to the magnets B and b. The casting or plate a is also provided with an arm or projection G, through which passes a set-screw g , which is adapted to regulate the movement of the armature D, and mounted on the casting or plate a in front of magnets B and b is a vibrator H, which is pivoted on a rod h , on which is mounted a spring h^2 , which bears upon a washer h^3 , which is placed on said armature, and a similar washer h^4 is placed beneath the armature. The inner end of said vibrator is provided with a yoke h^5 , which incloses the end of an arm h^6 , secured to the armature D, adjacent to the plate a , and the outer end of the vibrator H is provided with an insulating-block h^7 , on one side of which is a brush-spring h^8 , and a binding-screw K passes through a post k , secured to said plate, and is adapted to bear upon the end of said brush-spring.

Secured to the end of the plate a opposite the vibrator is an insulating-block L, which is made in the form of a horseshoe and which incloses the shaft C, and mounted on said shaft adjacent to said block L is a disk or plate L^2 , of rubber or other non-conducting material, the opposite sides of which are cut out to form segmental spaces L^3 .

Secured to the outer side of the block L in line with the vibrator is a metal bar M, provided with a binding-post m , to which is secured a brush-spring m^2 , which is adapted to bear on the disk L^2 , and said block is also provided with another metal arm or plate m^3 , provided with a binding-post m^4 , to which is

secured a brush-spring m^5 , which is also adapted to bear upon the disk L^2 , and between the arms or plates M and m^3 is a binding-post m^6 , through which passes a binding-screw m^7 , with which the brush-spring m^2 is adapted to contact, and said block L is provided at its outer side with another binding-post m^8 , through which passes a binding-screw m^9 , with which the brush-spring m^5 is adapted to make contact.

The electromagnets B and b are wound in the usual manner, and extending from the coil B is a conductor N , which connects with the binding-screw K , which is adapted to contact with the spring-brush h^8 on the vibrator, and connected with the brush h^8 through the insulating-block h^7 is a conductor n^3 , which connects with the binding-posts m^6 and m^8 , and the plates or arms M and m^3 are each provided with conductors O and O^2 , respectively.

We also provide a thermostat P , which is located in the compartment or room the temperature of which it is desired to regulate, and said thermostat consists of an oblong plate which is provided with an arm or bar P^2 , which is pivotally connected with the plate by a shaft P^3 and which consists of a composite of metal, one side of which is adapted to expand under heat more than the other and one end of which is free to move in either direction.

The conductors O and O^2 are connected with binding-posts O^3 , which are secured to the plate P , and connected with the battery n is another conductor R , which is connected with a similar binding-post O^4 , secured to the plate P and is in electrical connection with the shaft P^3 through the said plate, and a conductor R' extends from the battery to the coil B , and mounted in insulated posts R^2 adjacent to the free end of the composite bar P^2 are binding-screws R^3 and R^4 , and conductors S and S^2 extend from the binding-posts O^3 to said binding-screws R^3 R^4 , and the binding-posts O^3 are insulated from the plate P .

The operation of this device will be readily understood from the foregoing description when taken in connection with the accompanying drawings and the following statement thereof.

It will be understood that the ratchet-wheel always revolves to the right and cannot revolve to the left by reason of the pawls d^4 and F^2 . As shown in Fig. 1, the damper is supposed to be open, and the cam-plate L^2 is holding the brush m^2 in contact with the binding-screw m^7 , and whenever the temperature in the room in which the thermostat is located rises to the required point the bar P^2 will touch the binding-screws R^4 , and the current will pass through the conductor O and through the brush-spring m^2 , connected therewith, and to the vibrator H . The current will be completed through the magnet, and the armature will be raised. In this operation the pawl d^4

will turn the ratchet-wheel E until the pawl F^2 will engage the next tooth, and when the armature is raised the vibrator H , turning on the pin h^3 , will throw the brush h^8 out of contact with the screw K and the circuit will be broken, when the armature D will drop by gravity, and the pawl d^4 will engage the next tooth of the ratchet-wheel. When the armature has fallen into its normal position, the circuit will be again completed and the operation will be repeated until the damper is closed, when the brush m^2 will drop into one of the notches L^3 and the circuit will be broken, and at the same time the cam-plate L^2 will raise the brush m^5 into contact with the screw m^9 , and when the temperature in the room falls below the required point the bar P^2 will be warped in the opposite direction and will come in contact with the screw R^3 , and the circuit will be completed through the conductor O^2 , brush m^5 , screw m^9 , and conductor n^3 , when the armature will be again actuated and the damper will be opened, when the brush m^2 will be raised into contact with the screw m^7 , and the brush m^5 will drop into one of the notches L^3 .

This device is simple in construction and operation and well adapted to accomplish the result for which it is intended, and it is evident that changes in and modifications of the construction herein described may be made without departing from the spirit of our invention or sacrificing its advantages.

Having fully described our invention, we claim as new and desire to secure by Letters Patent—

In an electrically-operated damper, a shaft C , a damper c , mounted thereon, a cam-plate L mounted on said shaft C , magnets B , b , mounted adjacent to said shaft C , an armature D adapted to operate in connection with said magnets, a vibrator H adapted to open and close the electrical circuit, a ratchet-wheel E mounted upon the said shaft C , a pawl d^4 , mounted upon the said armature and adapted to engage said ratchet-wheel E , a pawl-detent F^2 mounted on the casing and adapted to engage the said ratchet-wheel E , brushes m^2 and m^5 adapted to bear upon said plate L , binding-screw m^7 and m^9 adapted to engage respectively said brushes m^2 and m^5 the said parts operating in combination with a thermostat, battery and suitable conductors, substantially as and for the purpose described.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses; this 30th day of April, 1896.

CHARLES KUMMER.
LEWIS BERTRAND.

Witnesses:

HARRY H. SCHLEICHER,
CHARLES J. ARM.