(No Model.)

H. BROEKER.

AUTOMATIC DAMPER.

No. 562,799. Patented June 30, 1896.

Fig. 1.

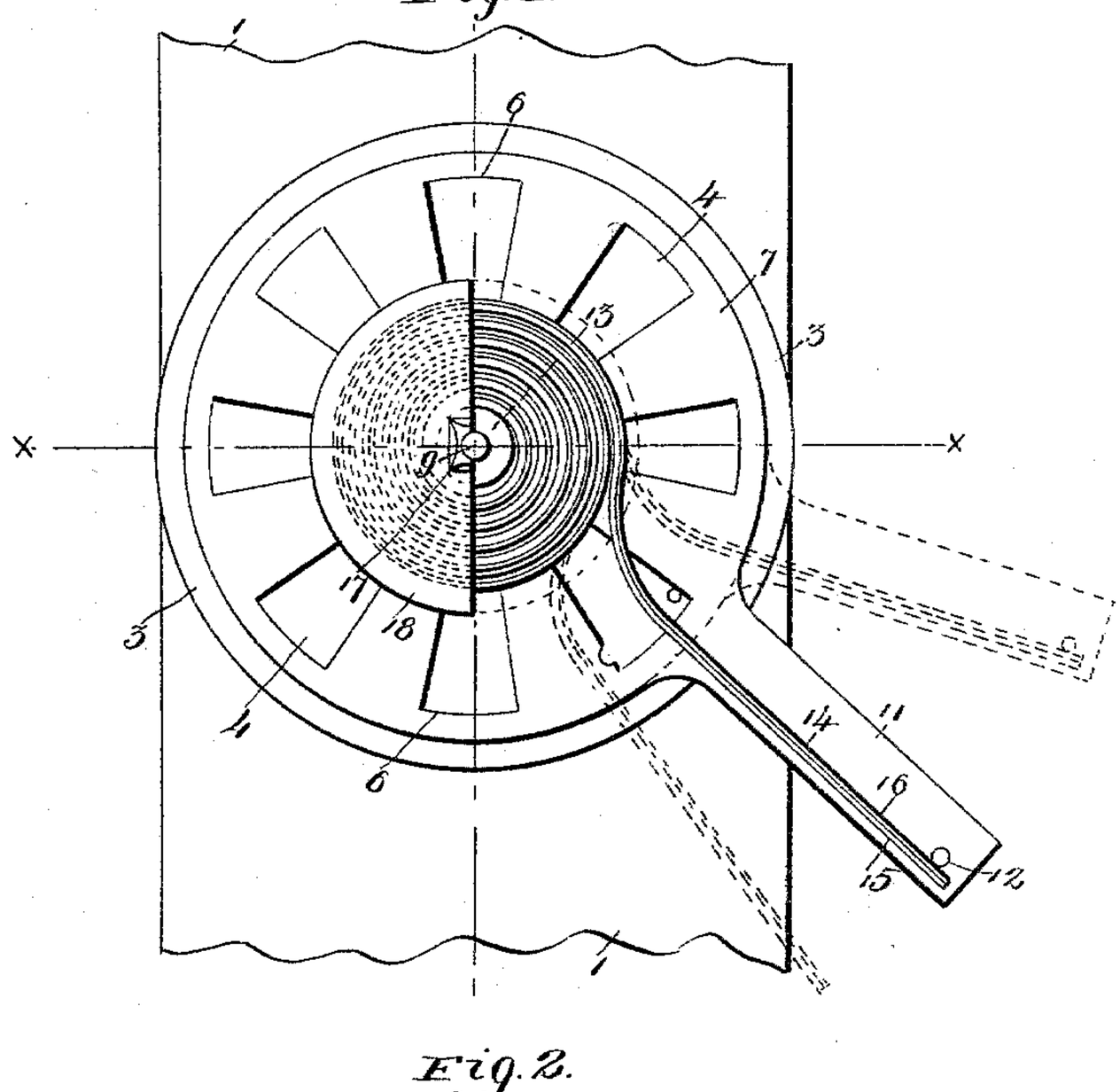
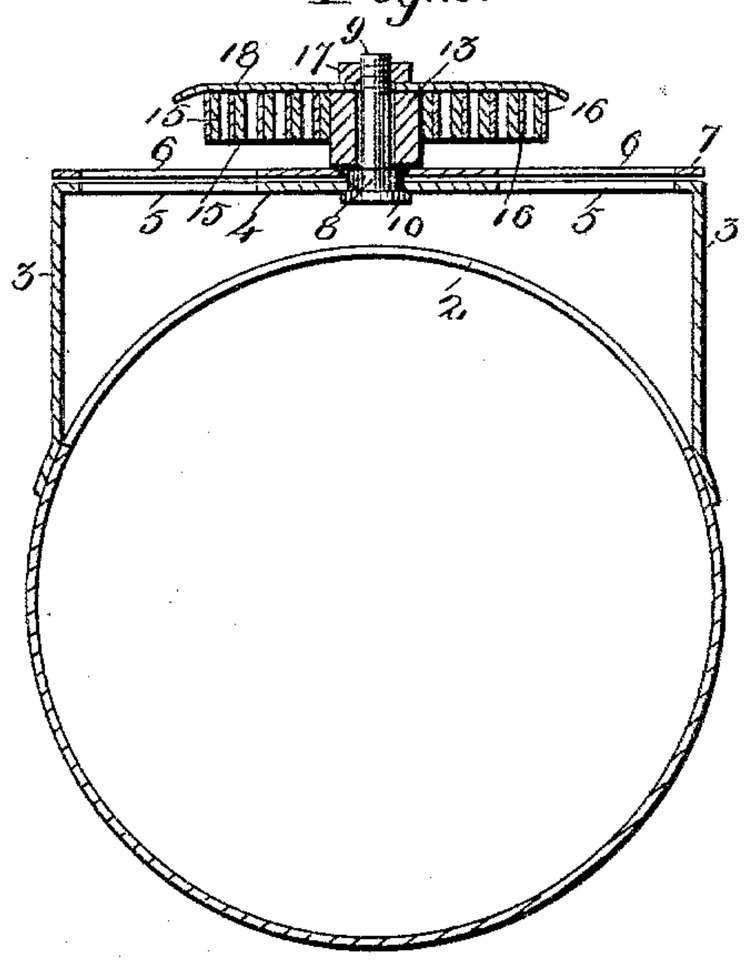


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY BROEKER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO HERMAN W. WICHMAN, OF SAME PLACE.

AUTOMATIC DAMPER.

SPECIFICATION forming part of Letters Patent No. 562,799, dated June 30, 1896.

Application filed September 5, 1895. Serial No. 561,481. (No model.)

To all whom it may concern:

Be it known that I, HENRY BROEKER, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Automatic Dampers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in stovepipe-dampers; and it consists in the novel arrangement and combination of parts more fully set forth in the specification, and pointed out in the claims.

In the drawings, Figure 1 is an elevation of a section of a stovepipe having my invention applied thereto, one-half of the cover-plate for the controlling-coil being removed; and Fig. 2 is a transverse section on the line *x x* of Fig. 1.

The object of my invention is to construct in a specific manner a stovepipe-damper which will automatically open or close according to the temperature of the fire in the stove; one which will be simple in construction, responsive to the slightest change in the temperature, thoroughly effective and durable, and one possessing further and other advantages to be now more fully set forth and described.

In detail the invention may be described as follows:

Referring to the drawings, 1 represents a section of a stovepipe, along the periphery of which is cut an opening 2, over which is superposed the supporting casing or pipe 3 for the stationary plate 4 of the damper. The plate 4 has a series of radial openings 5, with which coöperate corresponding openings 6 of the adjacent rotatable plate 7, said plate 7 being adapted to freely rotate about the enlarged shoulder 8 of an outwardly-projecting cylindrical shaft or rod 9, rigidly secured to the center of the stationary plate 4, and prevented from falling out by the terminal flanged head 10. Forming a part of the rotatable damper-plate 7 and extending outward in the plane of rotation of said plate is a projecting arm 11, carrying an outwardly-projecting pin 12 near the free end thereof. Loosely embracing the smooth cylindrical portion of the shaft 9 is a collar or sleeve 13, free to rotate about said shaft, the said collar having secured to the periphery thereof the inner end of a spring metallic coil, the loops of which are wound outwardly about each other in the same plane in the manner of a watch-spring, the outer loop being extended outwardly in the form of an arm 14, parallel to the arm 11, upon the upper surface of whose free end the pin 12, secured to the damper-arm, is adapted to engage. The loops of the coiled spring are formed of two strips or layers of metal, an inner strip of brass 15, and an outer strip 16 of steel welded together, the coefficient of expansion of the brass being greater than the coefficient of expansion of the steel. Although brass and steel are here described as an example it is evident that the coil can be built up of any two metals whose coefficients of expansion are unlike.

The outer projecting end of the shaft 9 is screw-threaded, said end being adapted to carry a nut 17, which is firmly screwed against a disk or plate 18, first slipped over the said shaft and made to bear against the lateral outer surface of the coil and collar 13, which latter it firmly presses against the top of the shoulder 8. The tighter the nut 17 is screwed, the more rigid will be the contact between the shoulder 8 and the collar 13 and the coil carried by it and the less will be the tendency of the coil to expand under the influence of heat by reason of the increased friction offered to such expansion by the pressure of the disk 18 against it, so that in a measure the expansion of the coil can be regulated by the degree of firmness with which the nut 17 is screwed down. As seen from the drawings, the damper-plate 7 is always free to rotate about the periphery of the shoulder 8.

In Fig. 1 I have shown the damper-plate as closed. When a fire is started in the stove and the latter has eventually become too hot, the controlling-coil at once begins to expand, the said expansion resulting in the upward raising of the free end of the controlling-arm 14 of the coil, which in turn presses against the pin 12, thus raising the free end of the damper-arm 11 and operating the damper to open communication with the interior of the pipe to a corresponding degree, and admitting

cold air into the pipe and thus cooling the fire. The position of the parts as thus shifted is shown by the dotted lines to the right of the damper-arm in Fig. 1. Normally, the pin 12 of the arm 11 is in contact with the free end of the controlling-arm 14 of the coil; but should it be desirable to raise the temperature of the room considerably before the damper is begun to be rotated, the coil may be so set originally as to bring the arm 14 to a considerable distance below the arm 11, as seen by dotted lines to the left of the damper-arm in Fig. 1. Under these circumstances the controlling-arm would first have to move up to the position indicated in full lines in Fig. 1 before it could begin to operate the damper-arm of the rotatable plate. It is to be observed that it is only by using two metals having different coefficients of expansion that the controlling-arm will sweep in the arc of a circle under variable changes of temperature. If the coil were made of but a single metal, the effect of changes of temperature would be to simply cause the coil to expand or contract radially, without moving the free end of the arm in the path of a circle, as here indicated.

Having described my invention, what I claim is—

1. In an automatic damper, a suitable stationary plate having draft-openings, a fixed shaft carried by the plate, a rotatable damper-plate carried by the shaft in proximity to the fixed plate, an outer coil having its inner end adapted to be clamped tightly to the shaft, an arm forming a part of the rotatable plate, an arm, forming a continuation of the coil, disposed parallel to the aforesaid arm, and a pin carried by the free end of the arm of the damper-plate for contacting with the arm of the coil, whereby the damper-plate is controlled by the movement of the arm of the coil, substantially as set forth.

2. An automatic damper comprising a fixed plate having a series of openings, a fixed shaft extending outwardly from the center of said plate, an enlarged shoulder forming a part of said shaft and located adjacent to or projecting from the outer surface of the fixed plate, a rotatable damper-plate carried by said shoulder, said rotatable plate having openings registering with the openings of the fixed plate, a collar loosely passed over the shaft and adapted to bear against the upper surface of the shoulder, a coil wound about the collar and having its inner end made secure thereto, said coil being composed of an inner layer of brass and an outer layer of steel welded together, an outer controlling-arm forming a continuation of the last loop of the coil, a suitable plate or disk adapted to be passed over the outer projecting end of the shaft and close over the outer exposed side of the coil, means for clamping the collar with its coil firmly against the shoulder, an arm forming a part of the rotatable damper-plate and a pin projecting from the side of the arm near the end thereof with which the end of the controlling-arm of the coil can come in contact and operate the damper-plate under the variable temperatures to which the coil is subjected, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY BROEKER.

Witnesses:

HERMAN W. WICHMAN,

ALFRED A. MATHEY.