F. E. KREATZ.

FIREPLACE.

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1,200,201.

Patented Oct. 3, 1916.

2 SHEETS—SHEET 1.

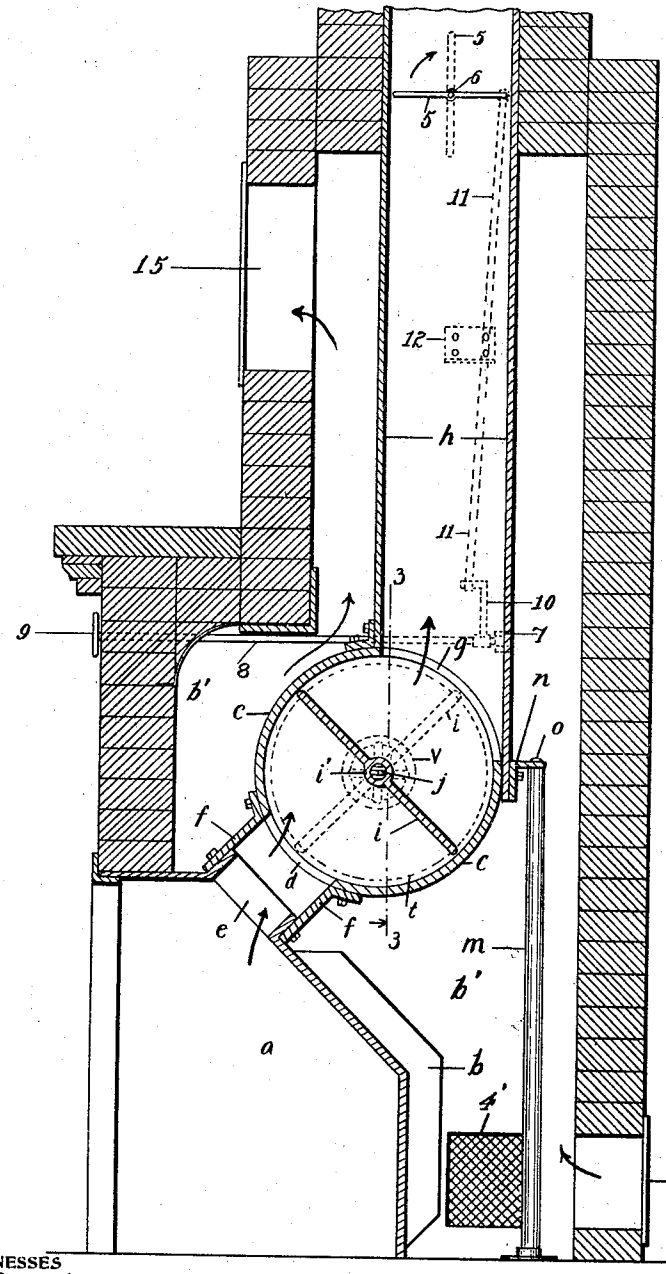


Fig. 1.

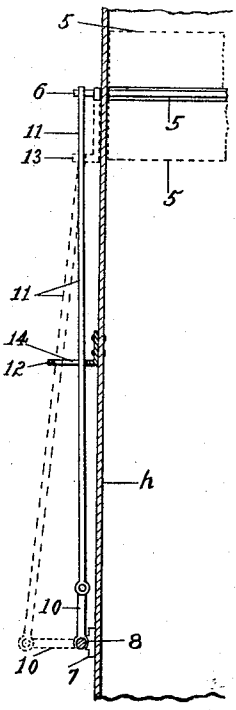


Fig. 5.

WITNESSES

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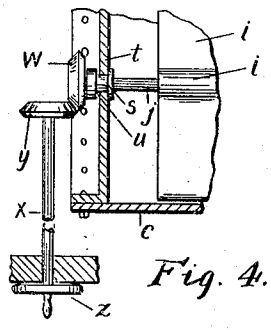


Fig. 4.

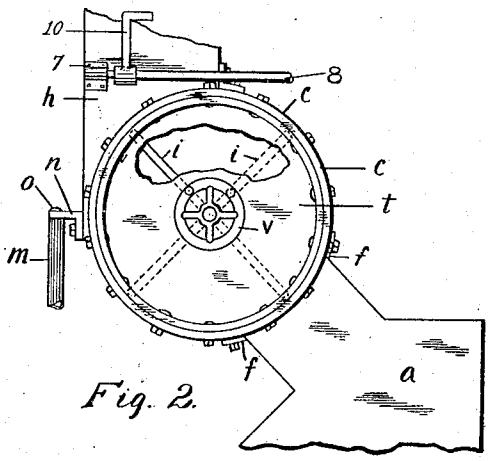


Fig. 2.

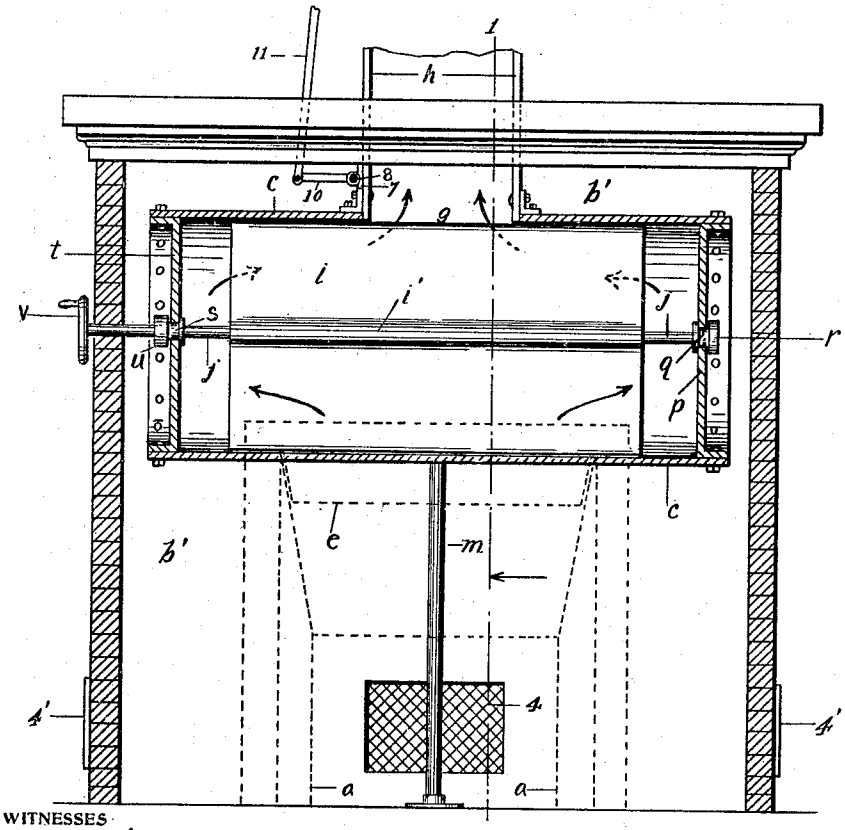


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FIREPLACE.

1,200,201. Specification of Letters Patent. Patented Oct. 3, 1916.

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To all whom it may concern:

Be it known that I, FREDERICK E. KREATZ, a citizen of the United States, and a resident of the city of Eugene, county of Lane, State of Oregon, have invented a new and useful Improvement in Fireplaces, of which the following is a specification.

This invention relates to improvements in fire-places having for their object the obtaining of a higher efficiency from the fuel consumed, by providing efficient means for causing the heated products of combustion, before escaping to the flue, to impart the greater part of their heat to a circulated current of air, which is then used as a heating medium.

I attain my objects by providing a drum through which the heated products of combustion must pass on their way to the flue; by further providing in such drum means for controlling and retarding the passage of such products of combustion through the drum; and also by providing means for controlling and retarding the escape up the flue of the heated products of combustion.

Details of my invention are hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a transverse vertical section taken approximately on the line 1—1 of Fig. 3. The full lines of this figure show the baffle-plate positioned so as to deflect the heated products of combustion to both ends of the heating drum before permitting the same to escape up the flue and chimney. The broken lines of this figure show the baffle-plate moved to a position permitting a direct communication between the combustion chamber and the flue. The damper is shown closed so as to retain the hot products of combustion in the chimney until the greater part of their heat has been radiated. Fig. 2 is an end elevation of the heating drum and the hand-wheel whereby the baffle-plate contained in said drum may be rotated. A portion of the drum is broken away for the purpose of greater clearness; fragments of the combustion chamber, the flue, and the rear supporting standard are also shown in their relative location with respect to said drum. Fig. 3 is a longitudinal vertical section of the fire-place and drum, taken approximately on the line 3—3 of Fig. 1; the baffle-plate is shown positioned in a vertical plane so as to illustrate more clearly its relative size with respect to the interior of said heating drum. The broken lines indicate the relative position of the combustion chamber. Fig. 4 is a detail showing another form of construction of the means for rotating the baffle-plate; and Fig. 5 is a sectional detail showing the arrangement of the means provided for operating the damper located in the upper portion of the flue.

The fire-place in connection with which my invention is shown in the accompanying drawings is of a common type of construction and will therefore be referred to merely as a means for locating the devices entering into the scheme of my invention. The combustion chamber of the fire-place has a casing, *a*, which may be metallic. The rear wall or back of such casing has a series of projecting, heat-radiating plates *b*, for increasing the radiating surface exposed in the air space *b'*. See Fig. 1. A cylindrical heating drum, *c*, is located above the throat, *e*, of the combustion chamber, and the opening, *d*, of such drum communicates with the throat, as shown in Fig. 1. The drum is supported by rigid flange members, *f*, bolted to said drum and to the casing *a*. The heating drum, *c*, has an outlet opening, *g*, located diametrically opposite the opening *d*, said opening leading to the flue *h*. All the products of combustion generated in the combustion chamber will be drawn up through the throat *e* into the heating drum *c*, and thence pass through the outlet opening, *g*, into the flue *h*. In order to retain the heated products of combustion in the drum, *c*, as long as possible, for the purpose of extracting the greater part of the heat contained therein and radiating and imparting the same from the drum to the body of air encompassing the latter, I provide particular means arranged as follows: In the drum, *c*, is provided a baffle-plate *i*, made with a circular portion, *i'*, through which extends a shaft *j*. The latter is journaled in the heads or ends of the drum, as shown in Fig. 3, and is provided at one end with a hand-wheel *v*, or similar means for rotating the baffle-plate *i*. The latter is of a width slightly smaller than the inside diameter of the drum and of such a length as to allow a small space between each of its ends and the adjacent drum heads. In this way, when the baffle-plate is positioned as shown by the full lines of Fig. 1, and by the broken lines of Fig. 2, the heated products of combustion will be compelled to travel to both ends of the drum

before being permitted to escape through the opening *g* and the flue *h*. By turning the baffle-plate to its position shown by the broken lines of Fig. 1, a direct draft will be created between the combustion chamber and the flue. Thus the baffle-plate fulfils also the functions of a damper. The bolts by means of which the drum *c* is connected to the casing, *a*, of the fire-place, and the casing of the flue *h* are all countersunk, thereby leaving the interior peripheral surface of the drum perfectly smooth. In this way when any amount of soot has been deposited on such surface of the drum, the baffle-plate, *i*, may be rapidly rotated, so as to act as a fan, thereby loosening said soot so that it may be expelled by the draft through the flue *h*. A standard *m*, conveniently made of a pipe is mounted on the floor of the air-space *b'* and serves as one support for the drum. An angle iron, *n*, is bolted, by bolt *o*, on the upper end of the standard *m*, and such angle iron is bolted to the rear wall of the flue *h* and the drum *c*, as shown in Fig. 1. The other support for the drum is provided by said members *f*.

The journal openings of the drum heads, *p*, *t*, are provided with bushings, *q*, *s*, respectively.

The shaft, *j*, is secured against longitudinal movement by collars, *r*, *u*, placed on its ends. The end of the shaft, *j*, projecting through the end wall of the fire-place has rigidly mounted on it a hand wheel *v*, for rotating said shaft. Another means for rotating said shaft is shown in Fig. 4. In this view the shaft, *j*, has mounted on it a bevel pinion *w*. A shaft, *x*, rotatably journaled in bearings supported on a wall of the fire-place, is provided on its inner end with a bevel gear *y*, meshing with the pinion *w*, and a hand-wheel, *z*, is mounted on the shaft *x*.

An air space is provided around the drum and flue, as shown in Figs. 1 and 3, and an air-inlet 4, located at the lower rear portion of the space *b'*, provides an inlet from the exterior for a circulating body of air. An air outlet, 15, leads into an upper room, and the air drawn in through the inlet 4, being heated by its contact with the drum *c*, is expanded and discharged through said outlet 15. Furthermore, auxiliary air-inlets 4', provided in the side walls of the fire-place, open into the room in which the fire-place is located. A direct communication is thereby established between the open space around the drum *c* and the room, thereby allowing the cool air to be drawn from the lower part of said room. This action also facilitates the ventilation of the room in which the fire-place is located.

In order to retain the heated products of combustion in the flue *h* as long as is conveniently desired, I have provided a damper 5 in the upper part of the flue. This damper is rigidly mounted on a rotatable shaft 6, located at a point in the flue above the warm air outlet 15; and if there are like outlets at two or more floors, then this damper is to be located above the highest of such outlets. By closing this damper, the heated smoke and other products of combustion may be held in the chimney for some time, so as to cause them to impart their heat to the air in the air space surrounding the flue, in the passage of such air to the warm air outlet 15. The details of construction of said damper are as follows: A journal bearing, 7, is fastened on the side wall of the flue *h*, and a shaft 8 is journaled in the former and a bearing affixed to the front wall of the fire-place. On the exterior portion of the shaft 8 is rigidly mounted a hand-wheel 9. A lever-arm 10 is fixedly mounted on the shaft 8, and a corresponding lever-arm 13 is fixed on the end of the damper-shaft 6, the planes of rotation of these two lever arms being perpendicular to each other. A pitman rod 11 connects said lever-arms. An angle support 12 made with a slot, 14, serves as a guide for the pitman, 11, when the damper is being operated. Thus, by rotating the hand-wheel the damper, 5, may be closed and opened as desired.

I claim:

In a fire-place, the combination of a back wall provided with an inclined top having a throat opening, a neck mounted on said throat opening, a cylindrical drum affixed to said throat opening, having an inlet opening registering with the outlet end of said neck, said drum also provided with an outlet opening located opposite to, and registering with its said inlet opening, a flue-pipe connected to said outlet opening of the drum, a shaft extending axially in said drum, and rotatably journaled in the ends thereof, a plate rigidly mounted on said shaft and rotatable in said drum, the plate extending to the sides of the drum on opposite sides of the shaft, the ends of said plate being spaced from the ends of the drum, one end of said shaft projecting through the adjacent wall of the fire-place, and means connected with said projecting end of the shaft for rotating the latter.

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Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."