

No. 707,053.

Patented Aug. 12, 1902.

W. D. DOUGLAS.
AIR FEEDING DEVICE.
(Application filed Mar. 5, 1902.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

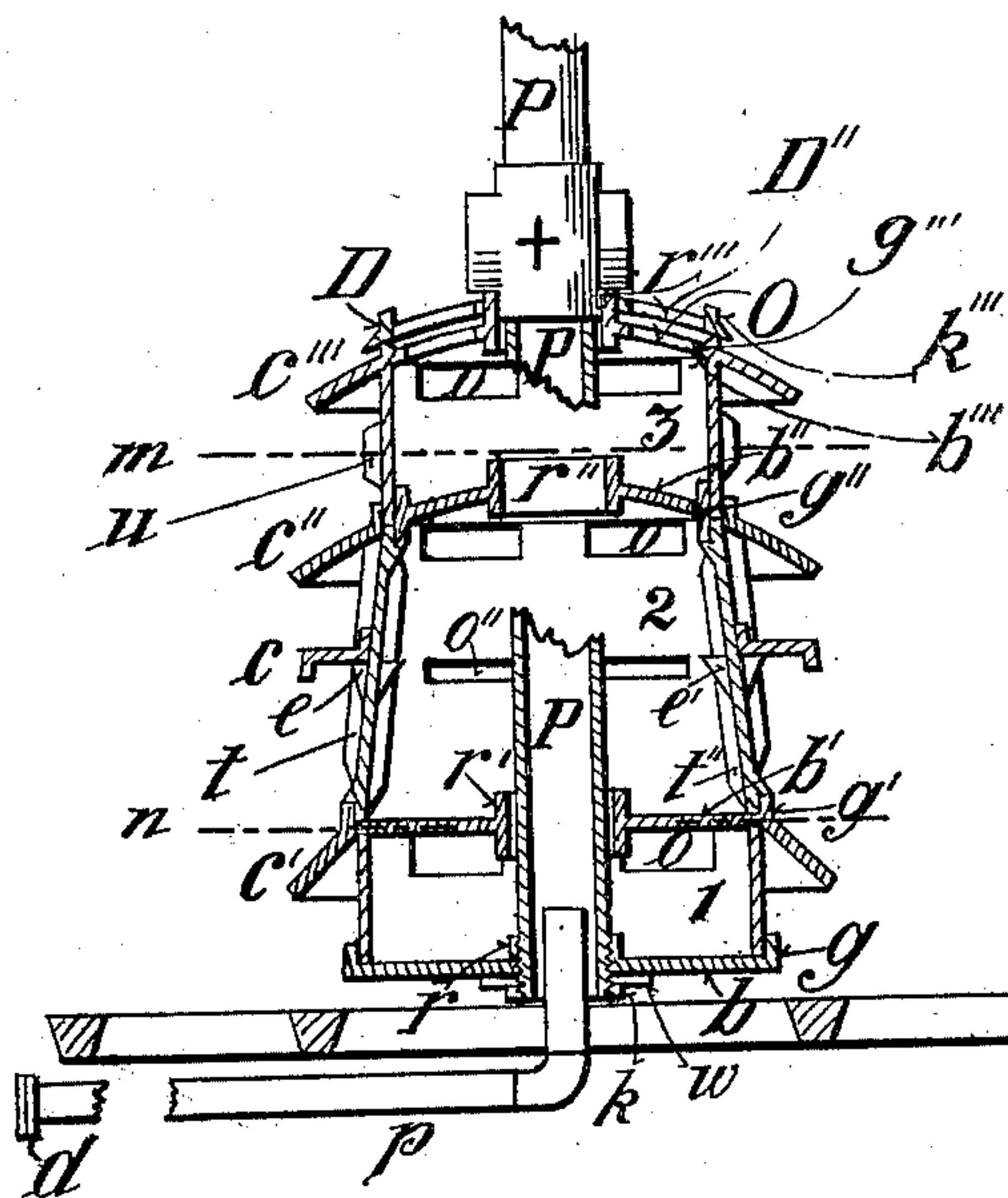


Fig. 1.

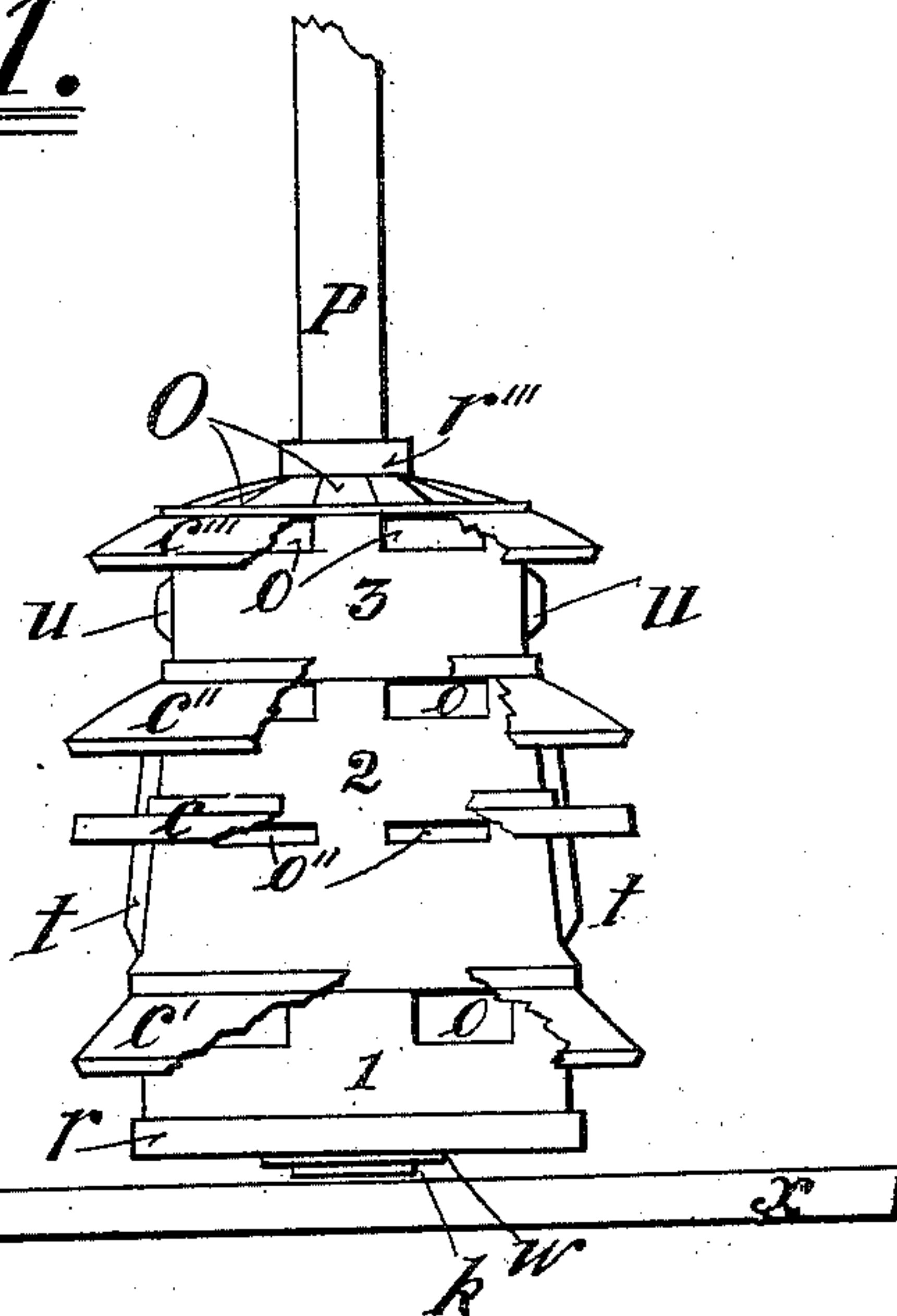


Fig. 3.

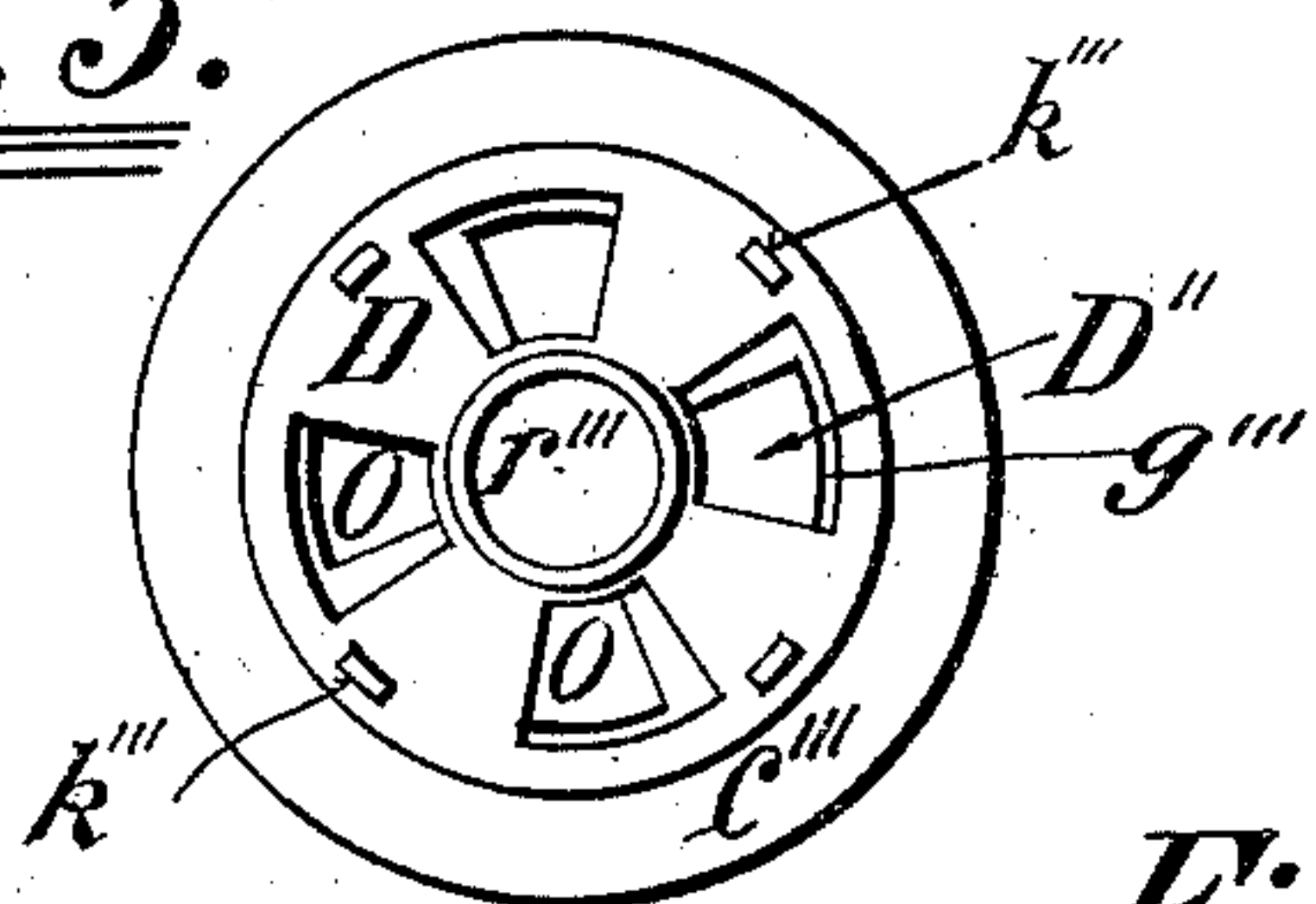


Fig. 4.

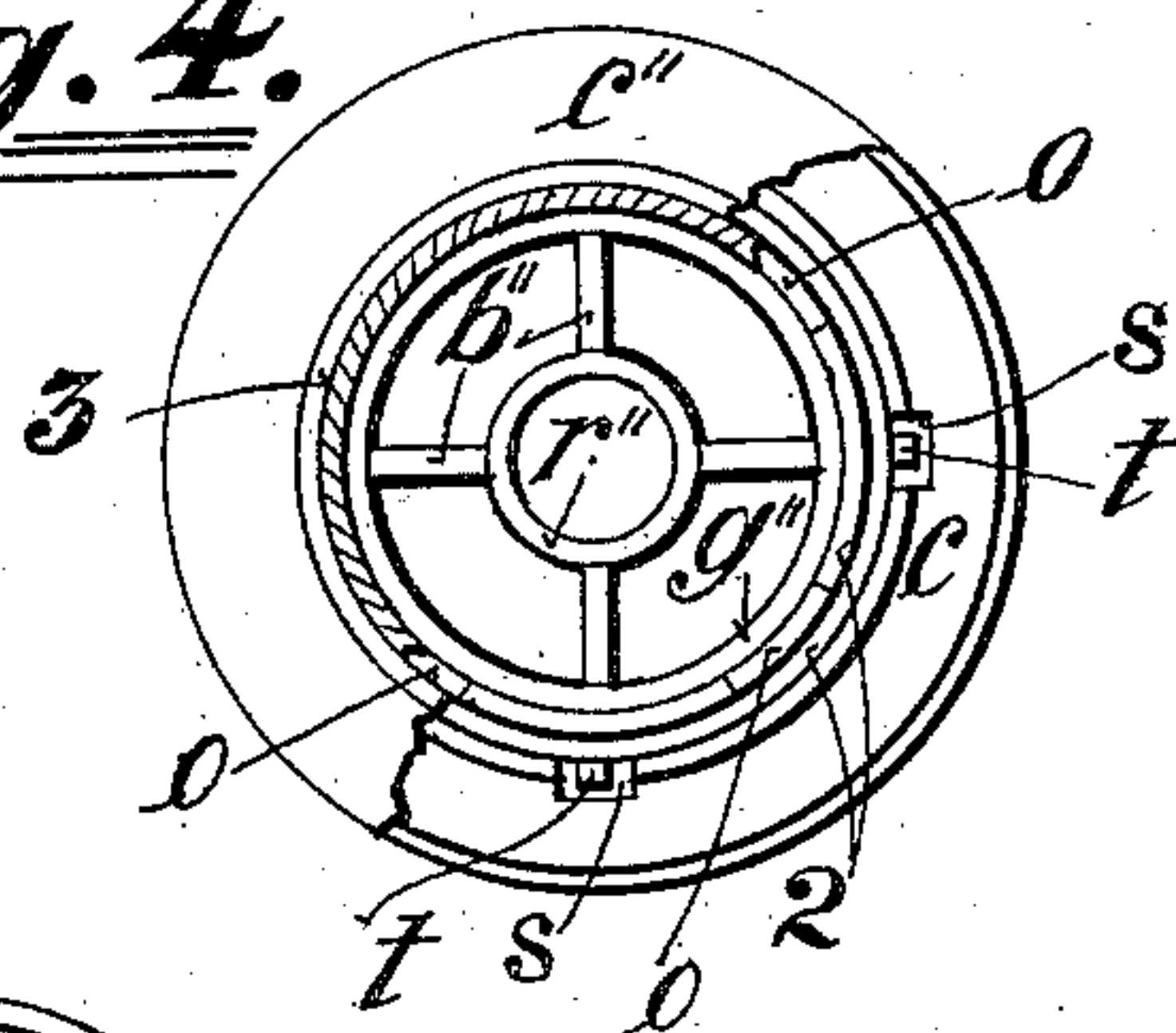


Fig. 6.

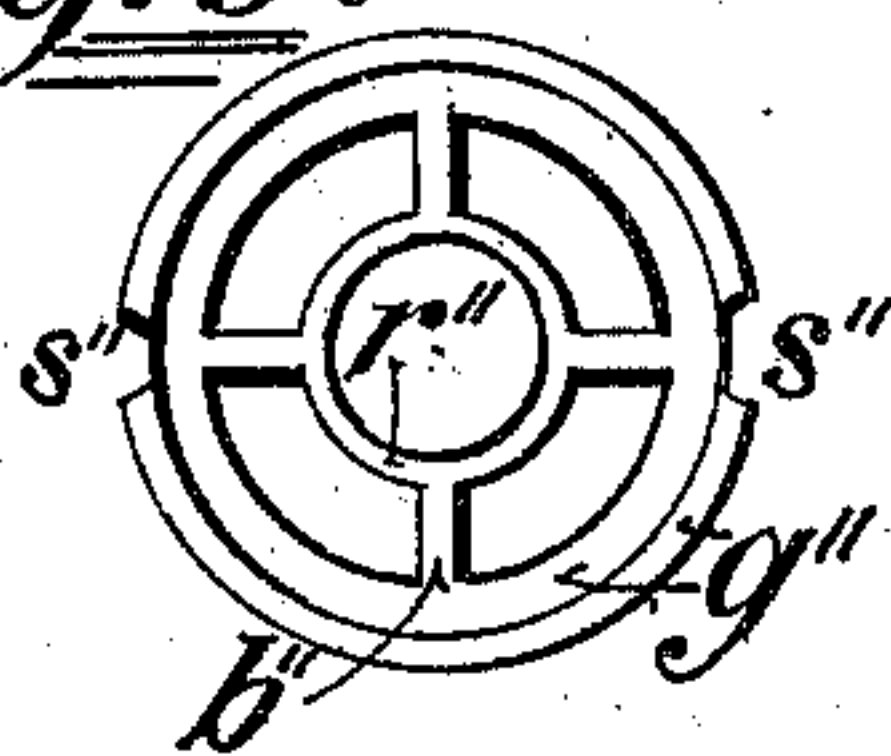


Fig. 5.

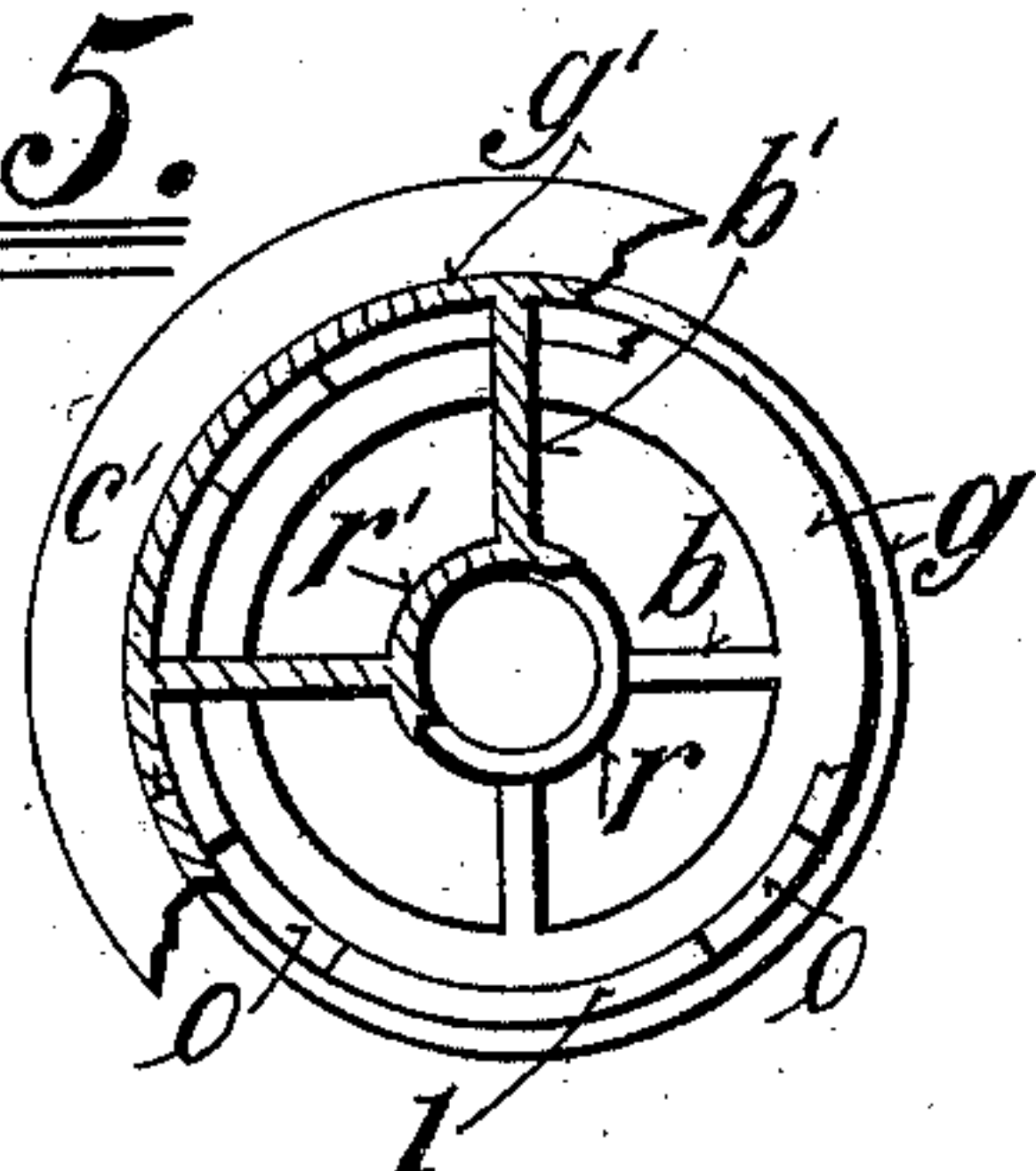
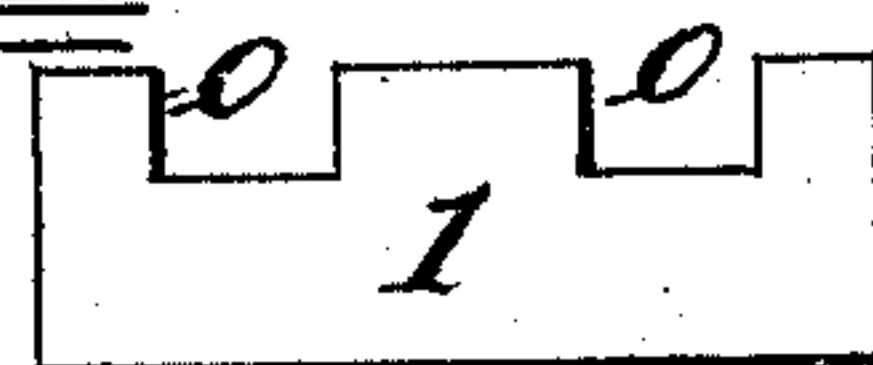


Fig. 7.



Witnesses.

Herbert A. Collins
Frank Proschowsky.

Inventor:

William Davis Douglas.

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2 Sheets—Sheet 2.

Fig. 8.

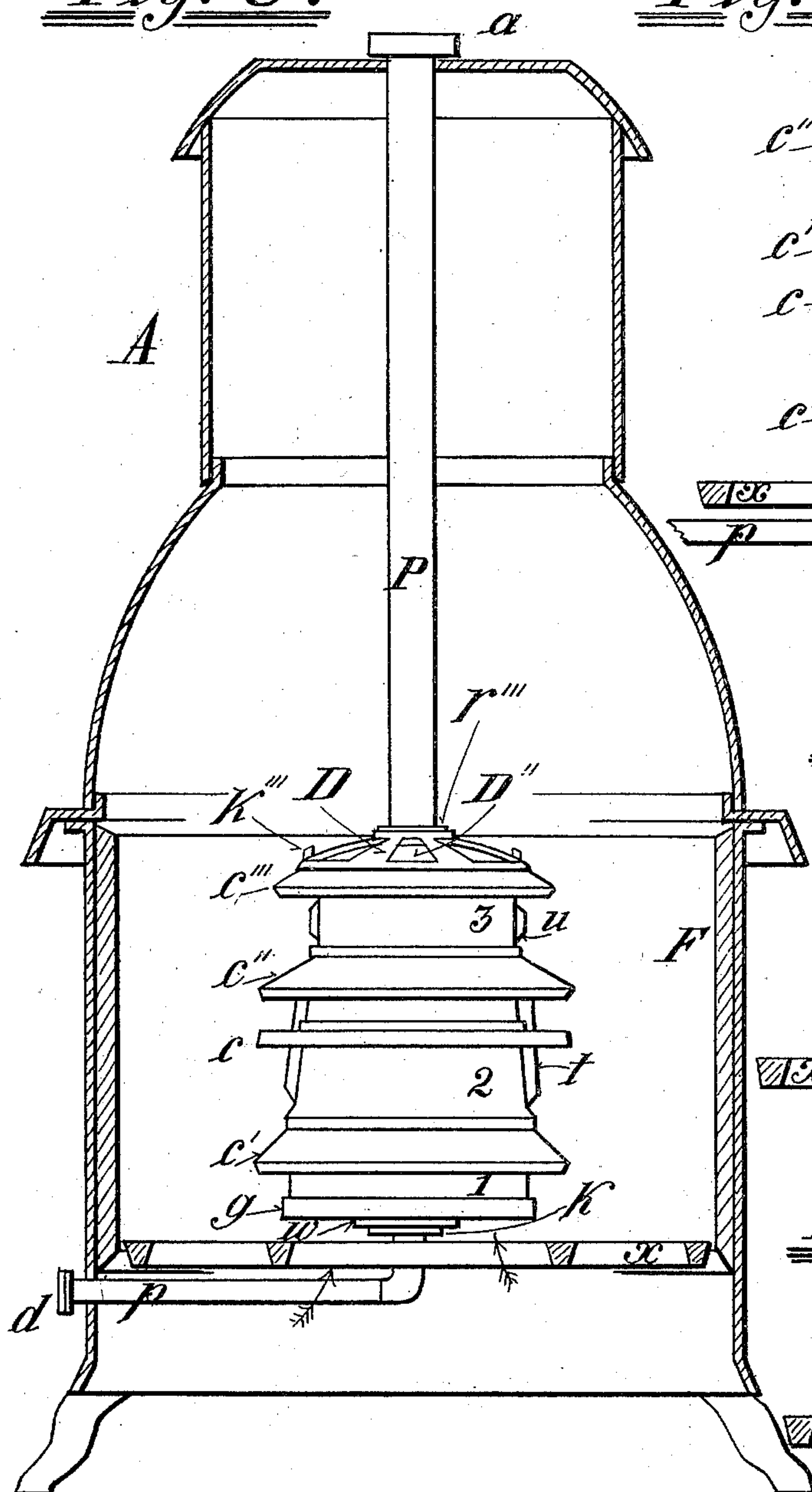


Fig. 9.

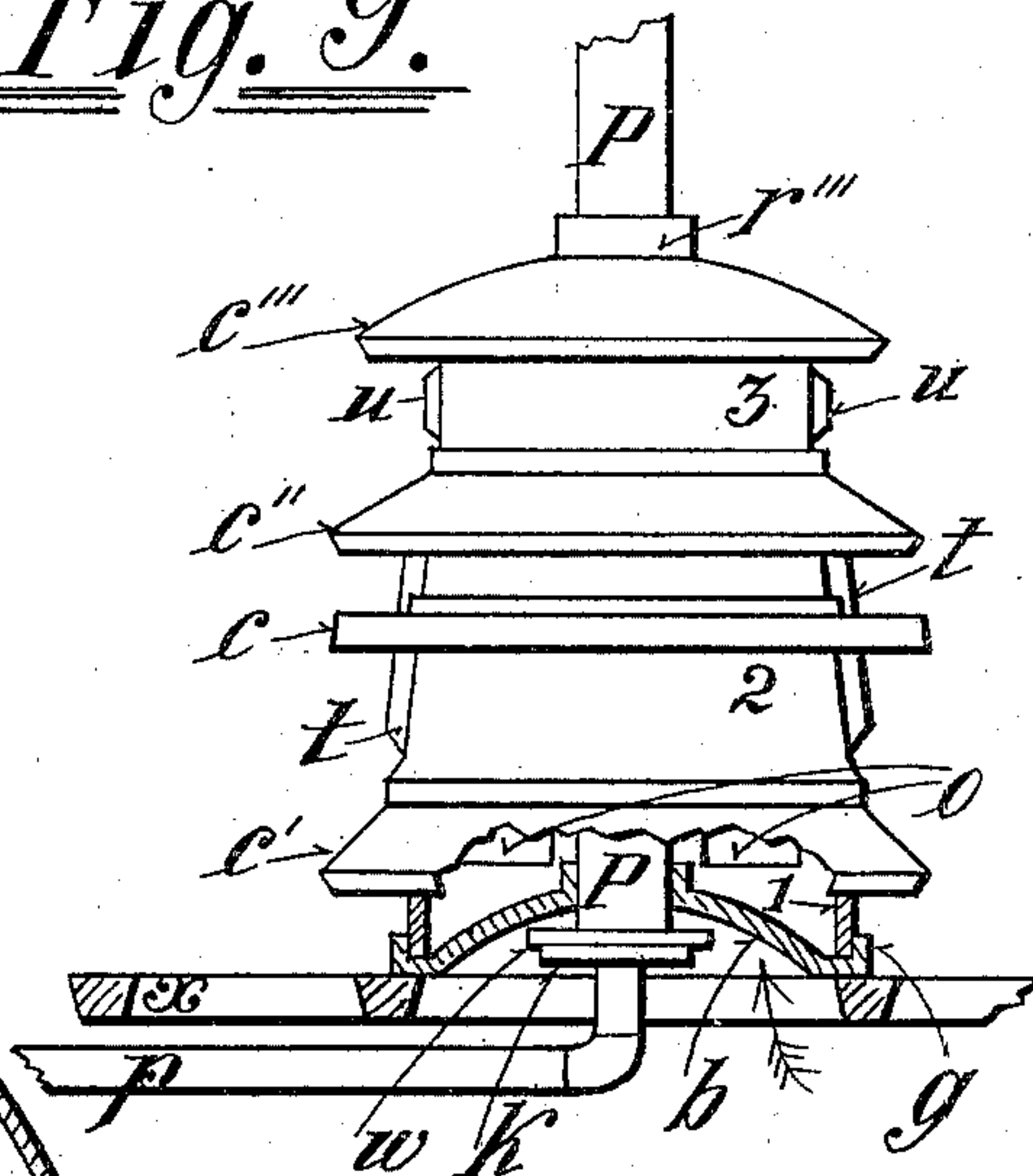


Fig. 10.

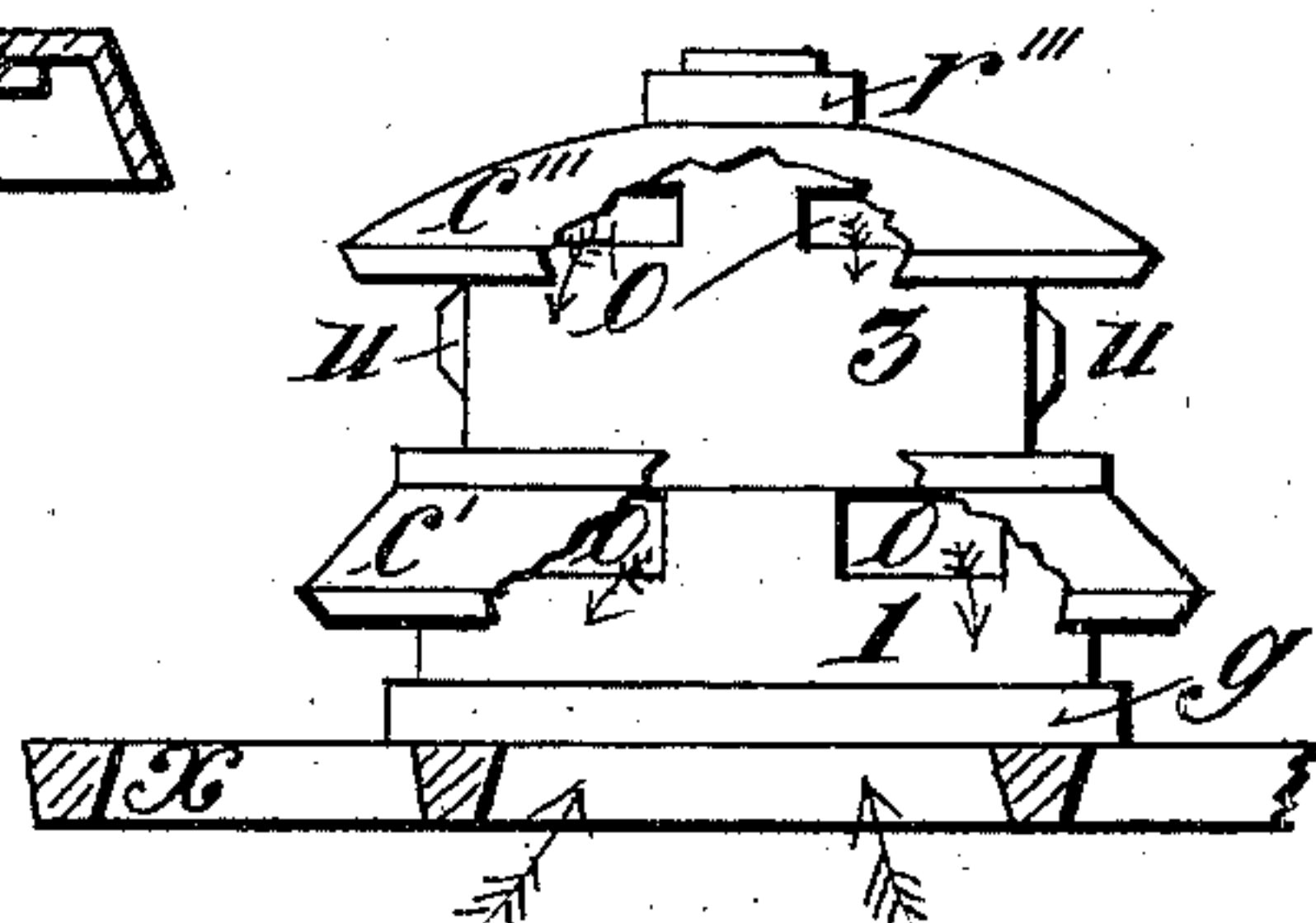
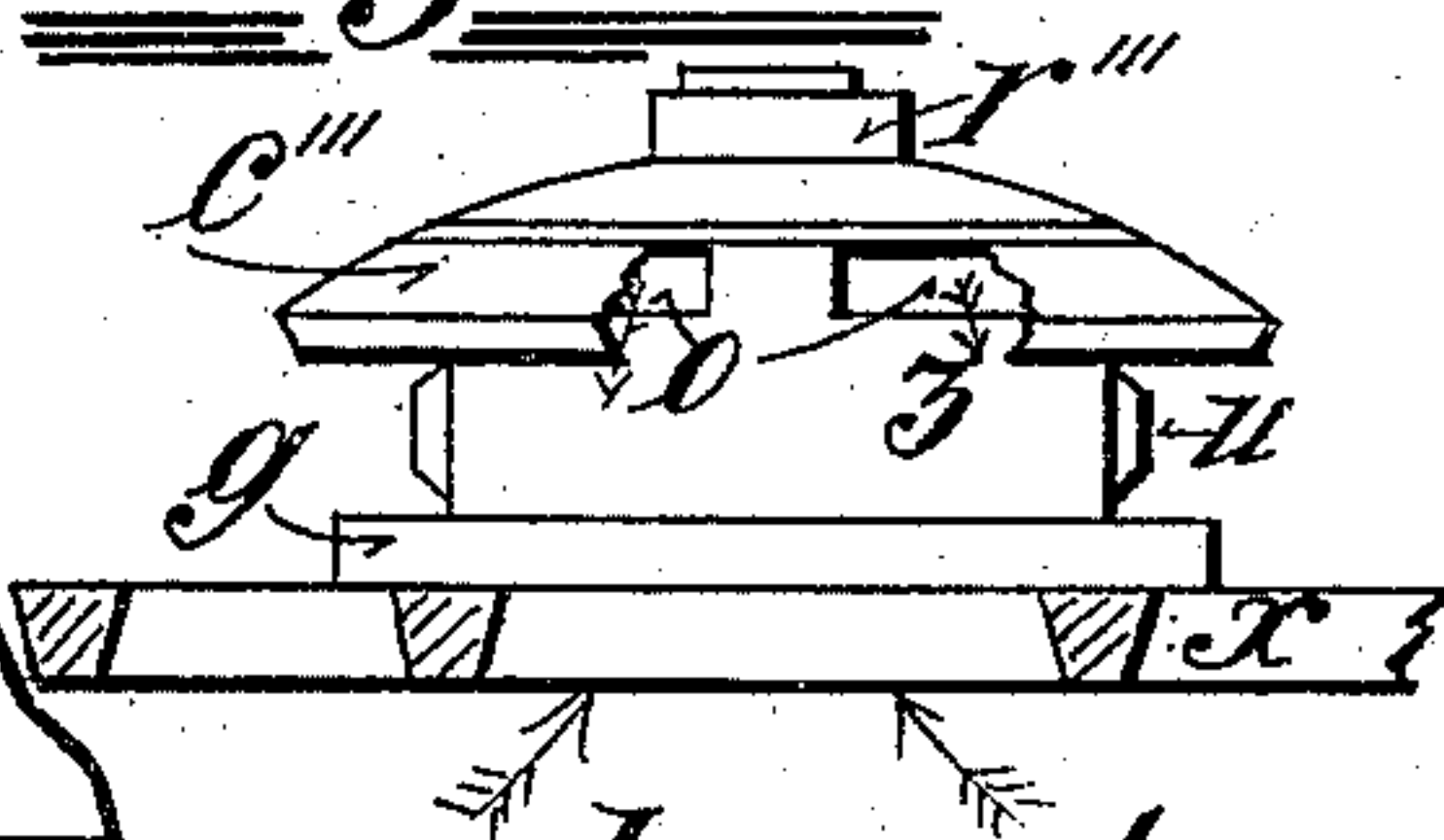


Fig. 11.



Witnesses.

Frank Proschowsky.
Herbert A. Collins

Inventor.

William Davis Douglas.

UNITED STATES PATENT OFFICE.

WILLIAM DAVIS DOUGLAS, OF CHICAGO, ILLINOIS.

AIR-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 707,053, dated August 12, 1902.

Application filed March 5, 1902. Serial No. 96,846. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DAVIS DOUGLAS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Air-Feeding Device, of which the following is a specification.

This invention relates to improvements in air-feeding devices to be employed to distribute heated air and promote combustion in the fire-pots of stoves, furnaces, or in open fireplaces; and it consists in certain peculiarities of the construction, novel arrangement, operation, and combination of its various parts, as will be hereinafter more fully set forth and specifically claimed.

The objects of my invention are, first, to obtain and furnish a comparatively greater amount of heat from a less quantity of fuel; second, to prevent fuel or ashes coming in contact or passing into the air-openings of the hot-air chamber; third, to provide means for obtaining a regulated diminution of heat or the rapid extinction of the fire without the usual inconvenience or waste of fuel, and, fourth, to insure the stability of the independently-adjustable interchangeable sections comprising the hot-air body or chamber.

Other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in elevation of an air-feeding device embodying one form of my invention, showing it located a little above the fire-grate, its covering or register being removed and having parts of its annular collars broken away, so as to disclose apertures in its horizontal sections. Fig. 2 is a vertical and nearly central sectional view of Fig. 1, showing the ribs and ledges of its middle section in elevation, its central pipe being partly broken away and supplied with a cross joint or coupling. Fig. 3 is top plan view of the upper section, showing the register thereon turned so as to partially cover the openings in said section. Fig. 4 is a horizontal sectional view taken on line *m* of Fig 2, viewed

from above, part of the top section and the top collar of the middle section being broken away to reveal part of the middle section, its external ribs, and the horizontal collar below. Fig. 5 is a horizontal sectional view taken on line *n* of Fig. 2, a portion being broken away to disclose the lower section and part of the skeleton frame thereunder. Fig. 6 is a plan view of an interior skeleton frame located at about the top of the middle section. Fig. 7 is a view in side elevation of the lower section of the air-feeding device. Fig. 8 is a view, partly in section and partly in elevation, showing the device located in a stove and illustrating one manner of suspending it therein. Fig. 9 is a view, partly in elevation and partly in section, of the air-feeding device and a portion of the grate, illustrating a modification in the construction of the lower or bottom skeleton frame. Fig. 10 is a fragmental view, partly in section and partly in elevation, showing a modified form of the air-feeding device; and Fig. 11 is a similar view of still another modification thereof.

Similar letters and numerals refer to like parts throughout the different views of the drawings.

In Figs. 1, 2, 8, and 9 of the drawings the body or casing of the air-feeding device is shown as consisting of three horizontal sections 1, 2, and 3, in each of which is a plurality of openings *o*, preferably at its top edge; but, as will be presently explained, a greater or less number of sections may be used. Interiorly located in about vertical alinement with each other and adjoining the top and bottom edges of the three sections mentioned is a series of skeleton frames consisting of the tubular central rings *r*, *r'*, *r''*, and *r'''*, linked, respectively, to corresponding larger flanged rings *g*, *g'*, *g''*, and *g'''* by a plurality of arched or horizontal bars *b*, *b'*, *b''*, and *b'''*, radiating therefrom. Exteriorly located about the tops of said sections is a series of outwardly and preferably downwardly-projecting annular shield-like collars *c'*, *c''*, and *c'''*, and about the middle of section 2, located over openings *o''*, is an annular and usually flanged and horizontal collar *c*, which rests on exterior ledges *e* and has bights *s* cut out of its inner edge to enable it to be adjusted unimpeded from above over the ex-

terior ribs t on the section 2 of the body. The collars c and c' of the middle section are each independently adjustable, and the collar c' forms an integral part of the skeleton frame, resting on section 1 and supporting section 2 of the body. The topmost collar c'' together with section 3 and its top or skeleton frame are shown as being formed in one piece, but may be made separately, if desired. The bars b''' of this top frame are broad and constitute a covering-dome having openings O therein, which may be alternately covered or exposed by a rotary register D , surmounting said dome and having corresponding openings D'' , as shown in Figs. 1, 2, 3, and 8.

In Figs. 9, 10, and 11 the dome is shown imperforate and the register is omitted on the drawings.

The lower skeleton frame, analogous to a flooring, supports section 1 and may have its bars b arched in order to economize in space, as represented by arched lines in Fig. 9 of the drawings. A supplementary arched skeleton frame similar to the one at the top of section 2 may rest on interior ledges e'' of the same section to aid in preventing an inward collapse of its wall, and bights in its outer edge similar to s'' (see Fig. 6) will enable it to be adjusted from above over the interior ribs t'' on said section. The entire air-feeding device may be and is preferably suspended by means of a pipe P , inserted through its middle rings and screwed into the lowermost ring r and projecting therethrough and having a washer w and any suitable nut or coupling k screwed thereon. Its upper end is projected through the lid or top of the stove A and may have a collar a to rest thereon, so as to support the said pipe. To avoid the evil effects of unequal expansion, the pipe P may comprise sections connected by couplings, or other joints or a cross-joint (see Fig. 2) may be used.

The exterior of the feed-pipe p may project through a stove and have any suitable damper, as d , affixed thereto to regulate the inflow of air independently of the usual dampers or registers with which stoves are furnished.

Some special features of my invention are, first, that the annular collars are so designed and located as to effectually shield and partially cover the air-openings o , so that no coal or ashes may come in contact with them, thus affording perpetually-unimpeded exits for air passing therethrough, and the tendency of coal being downward it will not pack up onto said openings, but will form itself into strata, as it were, on the several collars, from under which a continual supply of heated air is received at some distance from the body of the structure; second, that the rotary register D affords facility either for regulating the draft of heated air through the air-openings o or for the extinguishing of a fire, said register being operated from the exterior by pushing

its knobs k''' laterally, so as to partially or wholly uncover the openings O , thus enabling hot air to escape therethrough to be replaced by a continuous stream of cooler air, and, third, that the stability of the structure is assured by means of its central pipe P or rods L , and its sections being interchangeable its capacity may be increased or diminished by the addition or removal of any section similar to those marked 1, 2, and 3 in the drawings.

In Fig. 10 I have illustrated a modified form of the device in which the middle section is dispensed with and the top and bottom sections only are used, and in Fig. 11 still another modification is shown, which comprises the top section only, resting on the bottom skeleton frame g , which is supported by the grate. I desire it understood that any number of sections may be employed and that the body of the device may be supported in any suitable manner and that one or more of the skeleton frames may have arched or horizontal bars and other changes in the details of construction may be made without departing from the spirit of the invention.

In use the device is intended to be nearly or wholly covered with coal or fuel, and its top should be on about the same level as the top rim of the fire-pot F , and its bottom should cover about one-third ($\frac{1}{3}$) of the fire-grate.

Usually the several parts of my device are made of iron, but they may be constructed of any suitable material and of any size and form. Each of the sections forming the body or hot-air chamber may be made in vertical sections having external reinforcing-lugs u , and I may strengthen the constituent parts of the device by the addition of ribs similar to the ribs $t t''$ thereon.

From the foregoing and by reference to the drawings it will be clearly seen and readily understood that the air will enter the chamber formed by the sections through the bottom skeleton frame g and will pass out into the coal and fuel through the apertures in the sections, as indicated by the arrows, thus affording a continuous and plentiful supply of air and oxygen to the fuel.

When the pipe P is used and extends through the top of the stove or furnace, its upper end, being open, will furnish heated air to the room, which is taken in through the pipe p , which loosely telescopes with the first-named pipe, as shown.

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

1. In an air-feeding device, the combination with a casing having a plurality of openings in its walls, of an outwardly and downwardly projecting collar or piece located thereon above said openings, and a skeleton frame located on the lower portion of the casing, substantially as described.

2. In an air-feeding device, the combination with a casing having a plurality of openings in its walls, of an outwardly and down-

wardly projecting collar or piece located there-
on above said openings, and a skeleton frame
located on the lower portion of the casing,
said frame comprising an inner and outer
5 ring and a series of bars uniting said rings,
substantially as described.

3. In an air-feeding device, the combina-
tion with a casing having a plurality of open-
ings in its walls, and a number of openings
10 in its top, of an apertured register movable
on the top of the casing, and an outwardly
and downwardly projecting collar or piece
located on the casing above the openings in
its walls, substantially as described.

15 4. In an air-feeding device, the combina-
tion with a casing having a plurality of open-
ings in its walls and a number of openings in
its top, of an apertured register movable on
the top of the casing, an outwardly and down-
20 wardly projecting collar or piece located on
the casing above the openings in the walls
thereof, and a skeleton frame located on the
bottom of the casing, said frame comprising
an inner and outer ring and a series of bars
25 uniting the same, substantially as described.

5. In an air-feeding device, the combina-
tion with a casing provided in its top with a
number of openings and having in its walls
a plurality of horizontal rows of openings, of
30 an outwardly and downwardly projecting col-
lar or piece located on the casing above each
of its rows of openings, and an apertured reg-
ister movable on the top of the casing, sub-
stantially as described.

35 6. In an air-feeding device, the combina-
tion with a casing having a plurality of hori-
zontal rows of openings in its walls and a num-
ber of openings in its top, of an apertured reg-
ister movable on the top of the casing, an out-
40 wardly and downwardly projecting collar or
piece located on the casing above each of the
rows of openings therein, a skeleton frame
located on the bottom of the casing, a plu-
rality of skeleton frames located within the
45 casing between its bottom and top, each of
said skeleton frames comprising an inner and
outer ring and a series of bars uniting the
same, substantially as described.

7. In an air-feeding device, the combina-
50 tion with a casing having a plurality of hori-
zontal rows of openings in its walls and a num-
ber of openings in its top, of an apertured reg-
ister movable on the top of the casing, and a
downwardly and outwardly projecting collar
55 or piece located on the casing above each of
the rows of openings in the walls thereof, a
pipe extending centrally and vertically
through the casing and means to secure the
casing thereon, substantially as described.

60 8. In an air-feeding device, the combina-
tion with a casing comprising a plurality of
hollow sections, each provided with a plural-
ity of openings arranged in a horizontal row,
of an outwardly and downwardly projecting

collar located on the casing above each of the 65
rows of openings therein, a skeleton frame
located on the bottom of the casing, and one
or more skeleton frames located within the
casing between its bottom and top, each of
said skeleton frames comprising an inner and 70
outer ring and a series of bars uniting the
same, a pipe located in the inner rings of the
skeleton frames and extending through the
casing, and means to secure the casing on the
pipe, substantially as described. 75

9. In an air-feeding device, the combina-
tion with a casing having a plurality of open-
ings in its walls, of an outwardly and down-
wardly projecting collar or piece located there-
on above said openings so as to shield the 80
same, and a skeleton frame located on the
lower portion of the casing, said frame com-
prising an inner and outer ring and a series
of arched bars uniting said rings, substan-
tially as described. 85

10. In an air-feeding device, the combina-
tion of a casing having a plurality of horizon-
tal rows of openings in its walls, of an out-
wardly and downwardly projecting collar or
piece located on the casing above each of the 90
rows of openings therein so as to shield the
same, a skeleton frame located on the bottom
of the casing, a plurality of skeleton frames
located within the casing between its bottom
and top, the bottom skeleton frame compris- 95
ing an inner and outer ring and a series of
arched bars uniting the same, and the other
skeleton frames each comprising an inner and
outer ring and a series of bars uniting the
same, substantially as described. 100

11. In an air-feeding device, the combina-
tion with a grate, of a casing located there-
above and having a plurality of horizontal
rows of openings in its walls and a number
of openings in its top, of an apertured regis- 105
ter movable on the top of the casing, an out-
wardly and downwardly projecting collar or
piece located on the casing above each of the
rows of openings therein, so as to shield said
openings, a skeleton frame located on the 110
bottom of the casing, a plurality of skeleton
frames located within the casing between its
bottom and top, each of said skeleton frames
comprising an inner and outer ring and a se-
ries of bars uniting the same, a pipe located 115
in the inner rings of the skeleton frames and
extending through the casing, a feed-pipe
communicating at one of its ends with the
lower end of the first-named pipe, and a dam-
per located in the feed-pipe, substantially as 120
described.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

WILLIAM DAVIS DOUGLAS.

Witnesses:

J. T. DAVIS,
N. A. BEERS.