

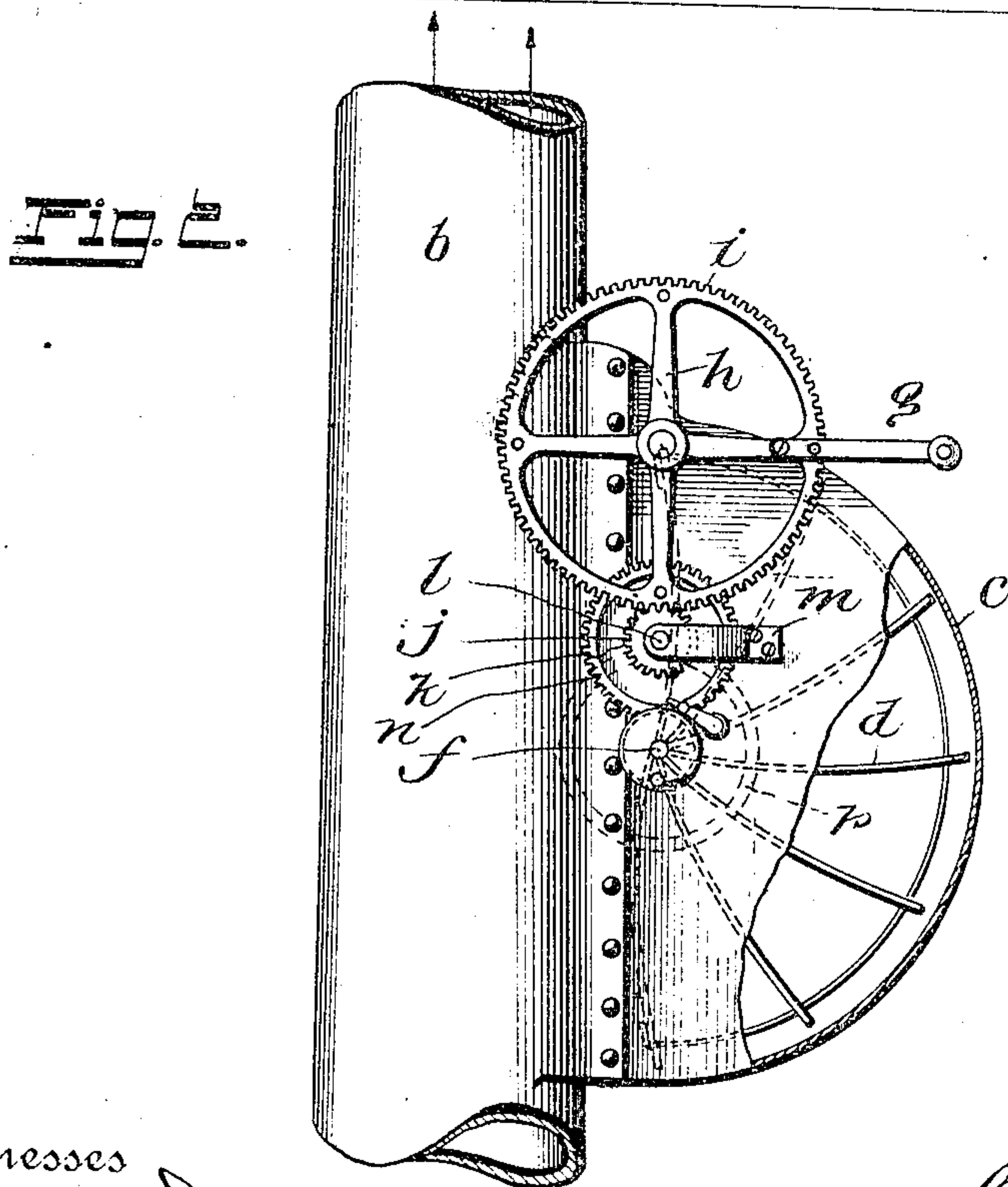
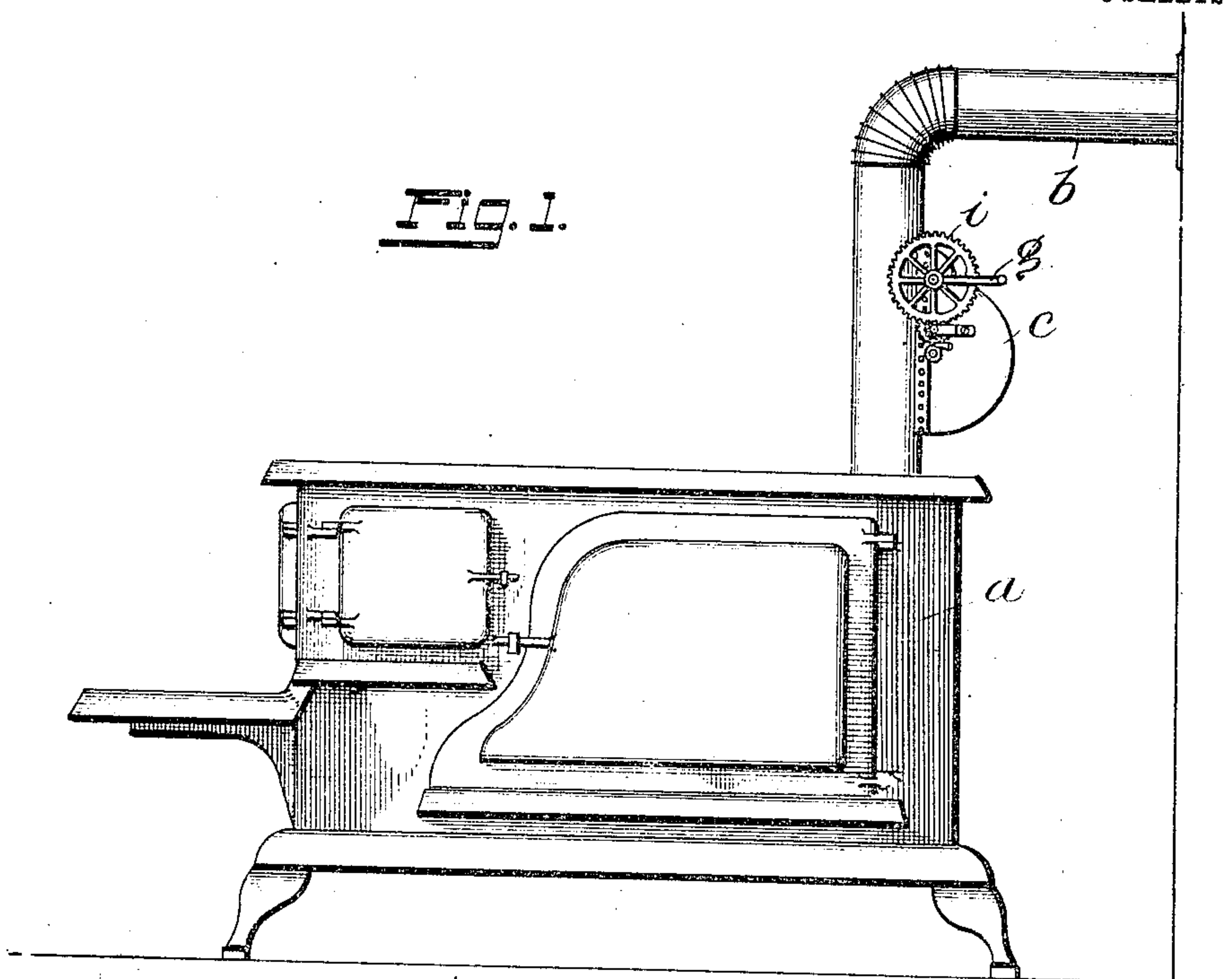
No. 886,268.

PATENTED APR. 28, 1908.

G. S. STUART.  
AUTOMATIC FORCE OR SUCTION DRAFT.

APPLICATION FILED NOV. 27, 1907.

3 SHEETS—SHEET 1.



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Fig. 3

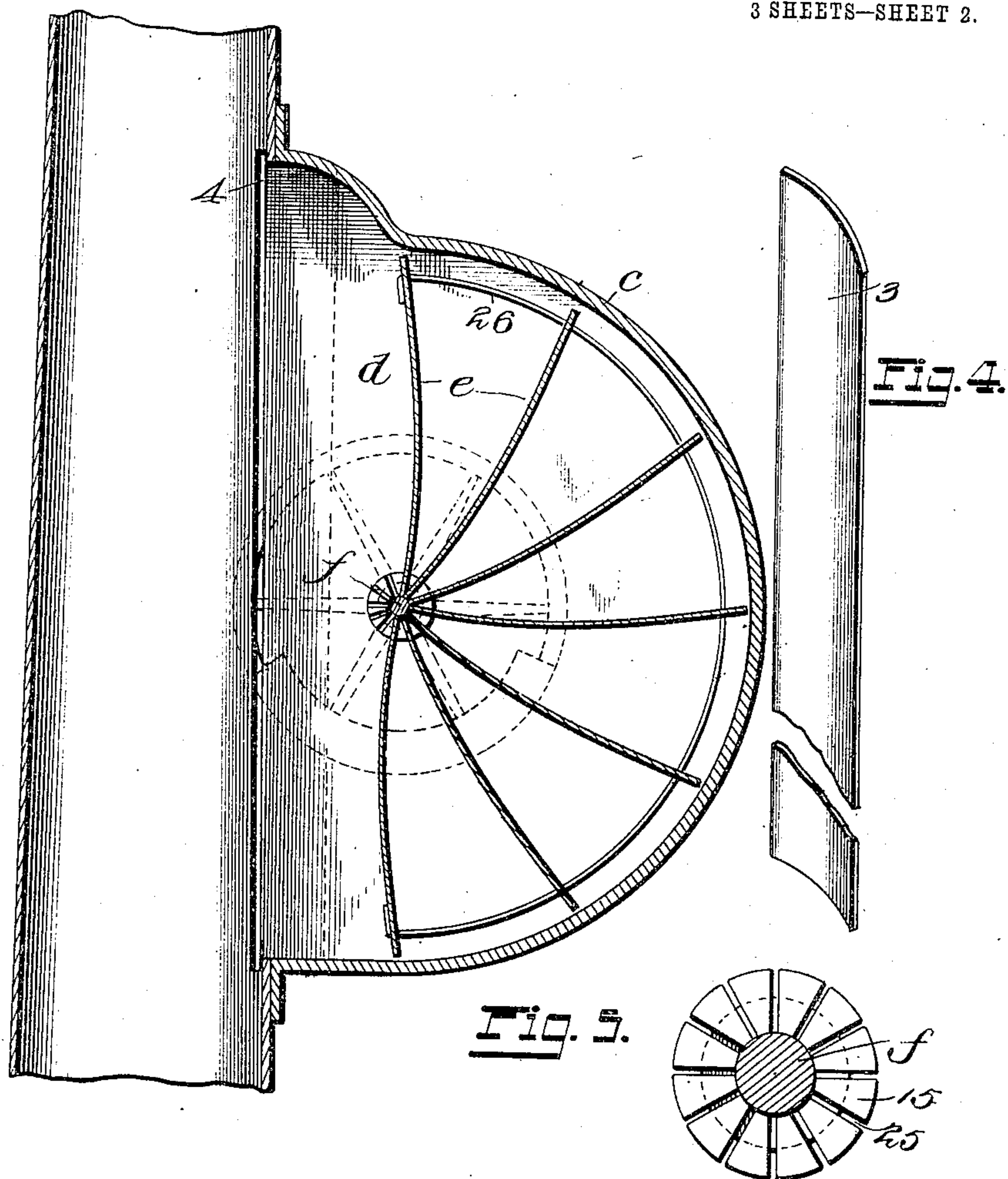


Fig. 5.

Fig. 4.

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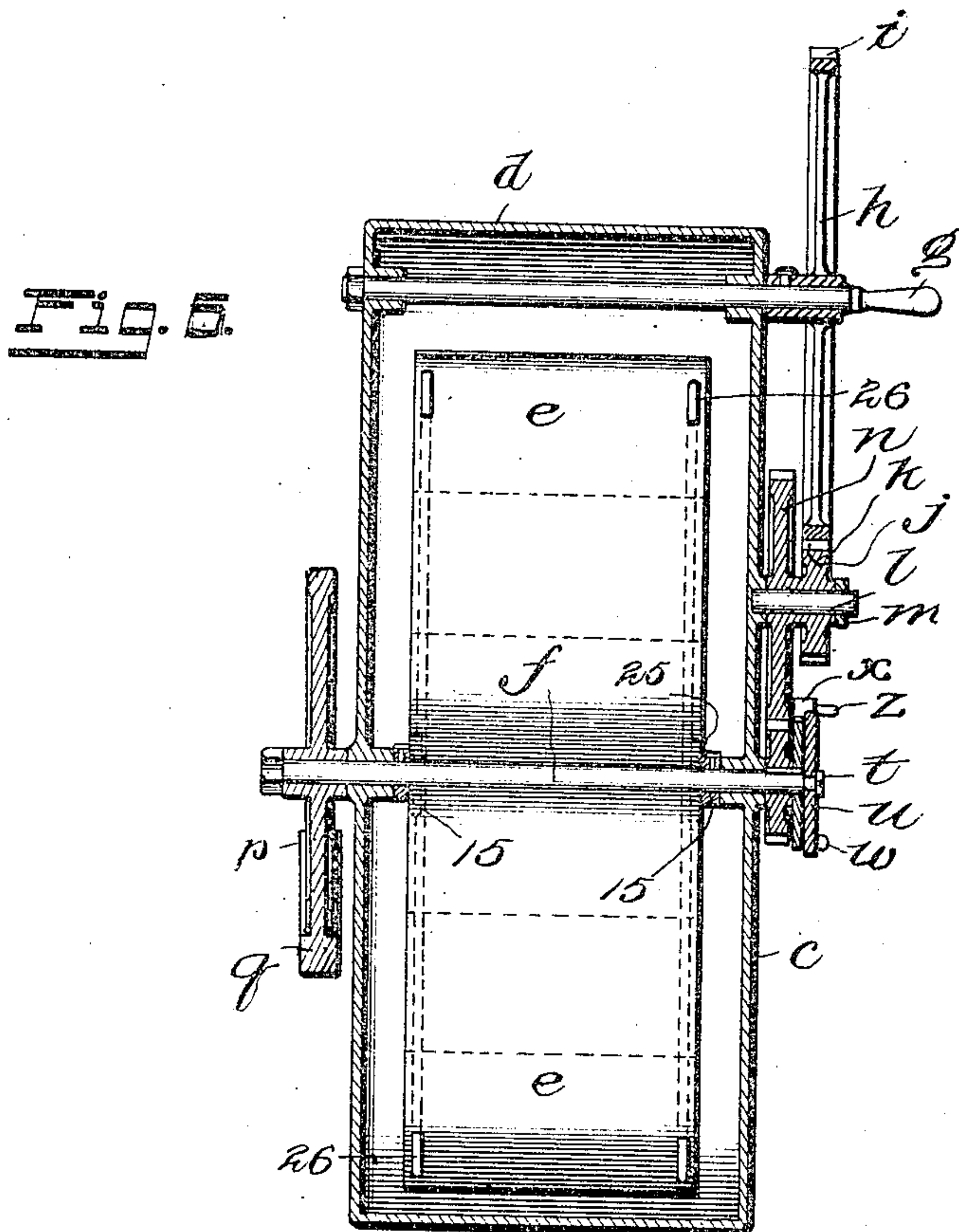
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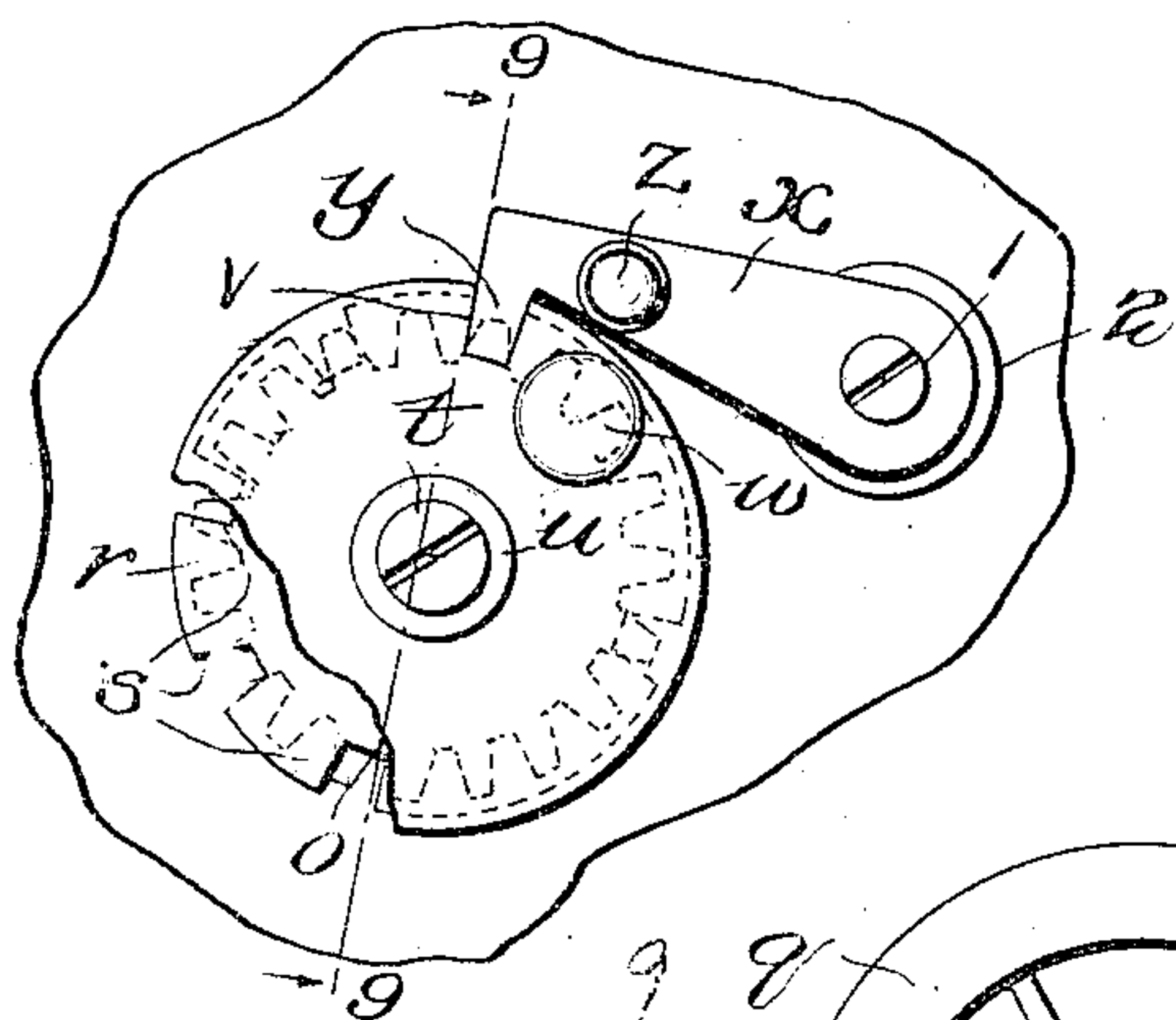
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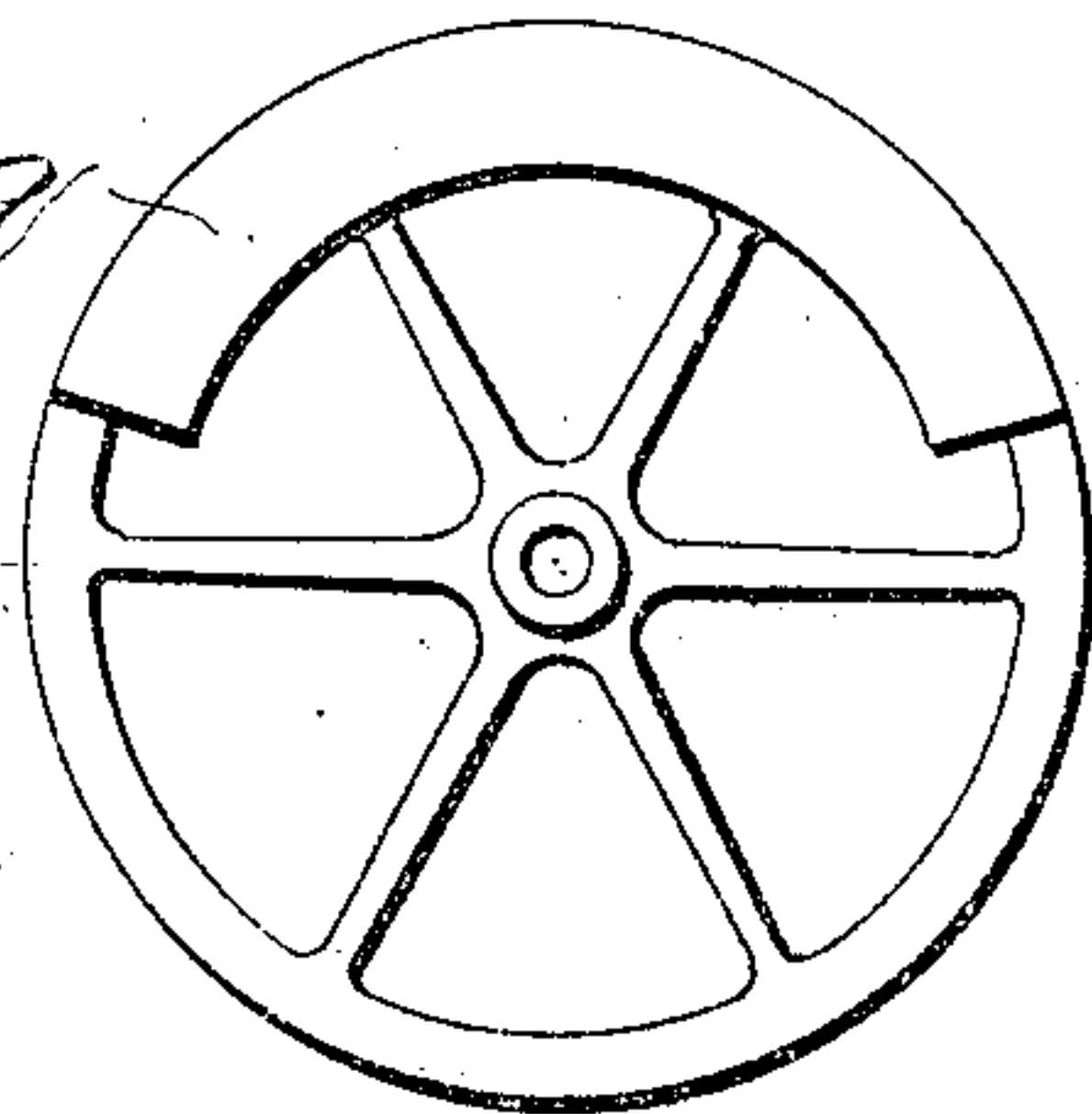
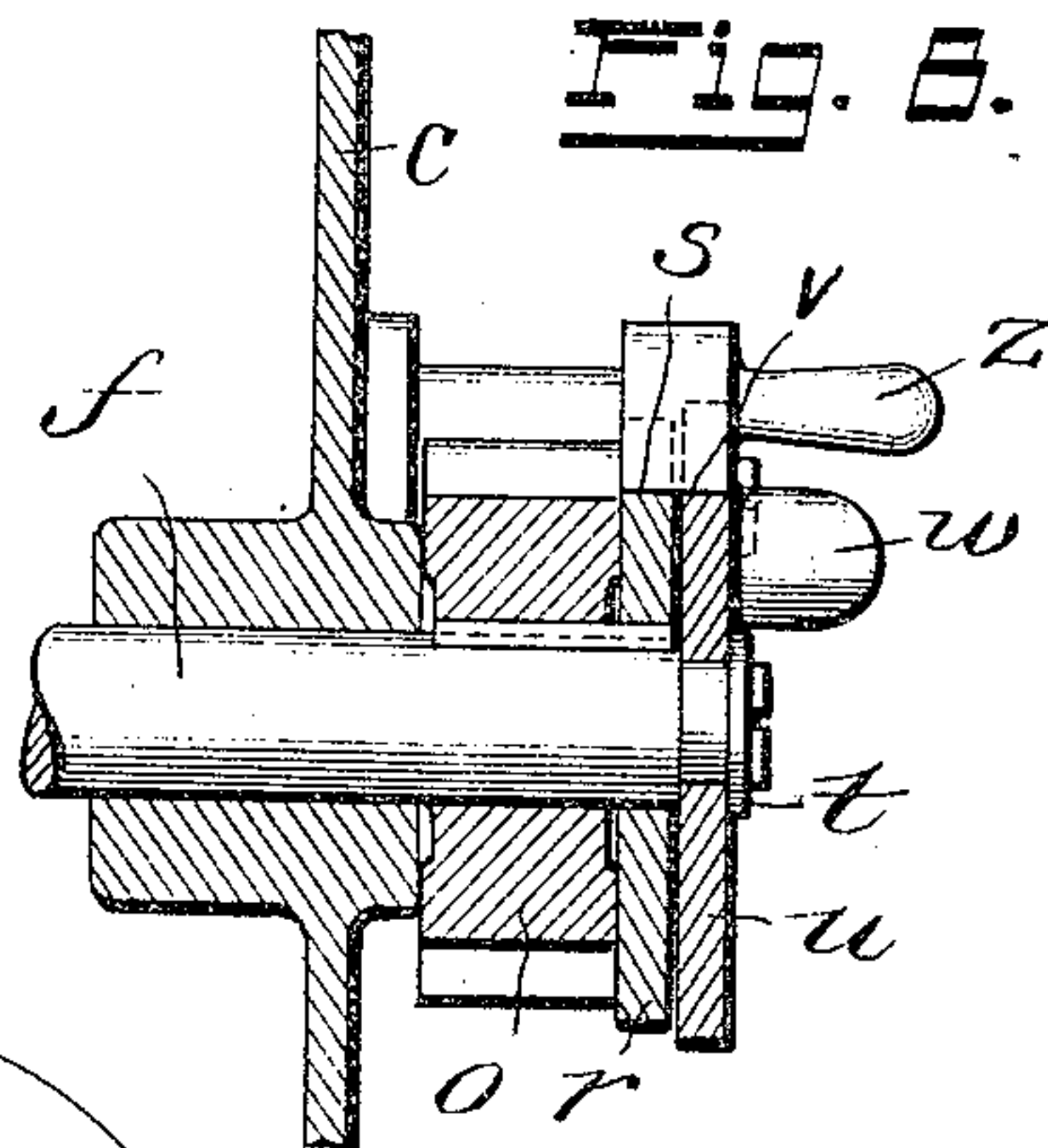
3 SHEETS—SHEET 3.



7.



199.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEORGE S. STUART, OF HOLLIDAYSBURG, PENNSYLVANIA.

## AUTOMATIC FORCE OR SUCTION DRAFT.

No. 886,263.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed November 27, 1907. Serial No. 404,116.

*To all whom it may concern:*

Be it known that I, GEORGE S. STUART, a citizen of the United States, residing at Hollidaysburg, in the county of Blair and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Force or Suction Drafts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in automatic force or suction drafts, and the object of my invention is to produce a simple device of this character which can be applied to a flue of an ordinary room stove or to any flue or stack, either of a locomotive or a stationary engine, or in fact at any place where it is desired to produce a forced draft or to clean a flue. It is also applicable for various other uses, as for example, in a planing mill it may be used to force the sawdust and shavings out through a pipe. The device may be worked by hand or power, as preferred.

With these objects in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings—Figure 1 is a side view of a cook stove and flue, showing my invention applied thereto. Fig. 2 is a side view of my invention, parts being broken away, applied to an ordinary flue, on a larger scale. Fig. 3 is a cross section of a large flue, showing my invention applied thereto. Fig. 4 is a perspective view of the slide for cutting off the moving parts from the rest of the flue. Fig. 5 shows the hub for holding the vanes. Fig. 6 is a vertical cross section of the device shown in Fig. 2. Fig. 7 is a side view, partly broken away, showing the means for locking the wheel in any desired position. Fig. 8 is a cross section on the line 9—9 of Fig. 7, and Fig. 9 is a side elevation of the weighted balance wheel.

*a* represents an ordinary cook stove and *b* the flue thereof.

My invention can be applied to any ordinary flue by cutting away the back and riveting the invention around the sides of the cut.

My invention comprises a casing *c* and a half wheel *d*, that is to say, a number of vanes *e* mounted in a hub 15 on a shaft *f* but leaving half of the wheel open so as not to impede the draft in the flue under ordinary

conditions. This wheel can also be used as a damper, as hereinafter described.

In the form shown in Figs. 1, 2, 3 and 6, this wheel *d* is driven by means of a crank handle *g*, attached to a skeleton wheel *h* provided with teeth *i* on the outside. The teeth *i* mesh with teeth *j* on a small pinion wheel *k* mounted on a stub-shaft *l*, secured in the casing *c* by means of a bracket *m*. On the shaft *l* is mounted another toothed wheel *n*, which gears with a pinion on the shaft *f*. Obviously by rotating the handle *g* through the connections described, the shaft *f* carrying a half wheel *d* will be rotated, causing a strong current up through the flue *b*. This can be used either to increase the draft in the stove or to clean out the flue, as desired. The shaft *f* runs through the casing *c*, and on the end opposite the crank handle carries a weighted wheel *p* provided with a weight *q*, the purpose of which is to bring the parts back into the position shown in Fig. 3 when the handle *z* is raised. The weight *q* also has another function, and that is to hold the wheel in the position shown in Fig. 3, this weight being substantially equal to the vanes *e*. The vanes *e* are preferably curved, as shown in Fig. 3. These vanes are inserted in slots 25 in the hubs 15. A wire 26, bent at the ends, is preferably used, passing through the vanes *e*, to stiffen the structure like an ordinary sliding damper. The wheel *d* can also be used as a damper, if desired, and can be set in any position by the following means, which are best shown in Figs. 7 and 8:—On the shaft *f* is mounted a wheel *r*, which is provided with grooves *s* on its circumference at intervals. This wheel is splined to the shaft *f*. On the extension *t* of the shaft *f* is mounted a second wheel *u* provided with a slot *v* on its periphery, and also provided with a projecting handle *w* which acts as a weight to normally swing the slot *v* nearly to the bottom.

*x* represents a pawl provided with toothed head *y* and an operating handle *z*. This pawl is mounted on a pivot pin 1 in a bracket 2 attached to the casing *c*.

The operation of this form of the device is as follows:—When it is desired to produce a draft in the stove, the pawl *x* is turned by means of the handle *z* so that it will entirely disengage the wheels *r* and *u*, whereupon the outer wheel *u* drops until its handle is at the lowest possible position. The outer wheel *u* is a little larger than the inner wheel *r*, so



that if the pawl *x* is accidentally thrown back so that its point *y* touches the wheel *u* it will be kept out of engagement with the wheel *r*. The wheel *d* is then rotated by means of the handle *g*. A strong draft is produced through the flue and, therefore, through the stove. If it is desired to have the wheel *d* act as a damper, the wheel or disk *u* is turned until the slot *v* therein will engage the hook *y* on the pawl, and the handle then turned until one of the slots in the wheel *r* registers with the slot *v*, whereupon the end *y* of the pawl drops into the notches and holds the entire apparatus against rotation.

Referring now to Figs. 3 and 4, it is sometimes desirable to cut the wheel *d* off from the main flue, in order to prevent dirt from collecting in the wheel, and this is done by means of a curved slidable partition 3 adapted to slide in a slot 4, as shown in Figs. 3 and 4.

Of course, a pulley could be applied to the shaft of the wheel *h* and the apparatus driven by power, if desired.

1 claim.

1. The combination of a flue or stack having a cut-away portion, and a force draft device adapted to be fitted around said cut-away portion, and having a shaft provided with curved vanes extending only part way around said shaft, forming a partial wheel, and means for rotating said shaft, substantially as described.

2. The combination of a flue or stack having a cut-away portion, and a force draft device adapted to be fitted around said cut-away portion and having a shaft provided with curved vanes extending approximately half way around said shaft, and means for rotating said shaft, substantially as described.

3. The combination of a flue or stack having a part cut away, with a casing adapted to be fitted around said cut-away portion, a shaft journaled in said casing, a series of removable curved vanes fastened to said shaft and extending approximately half way around it, and means carried by said casing for rotating said shaft, substantially as described.

4. The combination of a flue or stack having a cut-away portion, with a force draft device consisting of a casing adapted to be fitted around said cut-away portion, a shaft mounted in said casing and provided with curved vanes, said vanes extending only part way around said shaft, and means for locking said shaft in any position whereby said vanes may be caused to act as a damper, substantially as described.

5. The combination of a flue or stack having a cut-away portion, with a force draft device including a casing adapted to be fitted around said cut-away portion, a shaft

mounted in said casing and provided with a plurality of vanes extending about half way around said shaft, means for rotating said shaft, and adjustable devices for fastening said shaft in any desired position, substantially as described.

6. The combination of a flue or stack having a part cut-away, a force draft device adapted to be fitted around the cut-away portion, said device consisting of a casing, a shaft mounted in said casing, vanes on said shaft extending approximately half way around said shaft, and a movable partition adapted to be slipped in front of said wheel to close up the opening in said flue or stack, substantially as described.

7. The combination of a flue having a cut-away portion, and a force draft device including a casing adapted to fit around said cut-away portion, a shaft mounted in said casing, vanes on said shaft extending half way around same to form a half-wheel, means for rotating said shaft, and a balance wheel on said shaft, substantially as described.

8. A force draft device adapted to be fitted on to an ordinary flue and consisting of a casing, a shaft journaled in said casing and provided with curved vanes extending about half way around said shaft, and thereby forming a half-wheel, means for rotating said shaft, and a balance wheel on said shaft having a weighted portion oppositely located with respect to said vanes, thereby balancing said wheel, substantially as described.

9. A balance draft device adapted to be attached to an ordinary flue, and including a casing, a shaft mounted therein and having curved vanes attached thereto about half way around said shaft, thereby forming a half wheel, means for rotating said shaft, a weighted wheel attached to said shaft, near its end, to balance said vanes, and means for locking said wheel in any desired position, substantially as described.

10. The combination of a flue having a cut-away portion, and a force draft device adapted to be secured thereto, and including a casing adapted to be secured to said flue, a shaft mounted in said casing and provided with vanes, and means for locking said shaft in any desired position, said means including two wheels or disks provided with slots, one of said wheels being keyed to said shaft and the other being loosely mounted thereon, and a pawl for engaging the slots in said wheels, substantially as described.

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

GEORGE S. STUART.

Witnesses:

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A. W. NEALE, Jr.