(No Model.) 2 Sheets—Sheet 1.

J. M. HARTMAN.

FLUE CLEANER.

No. 253,862. Patented Feb. 21, 1882.

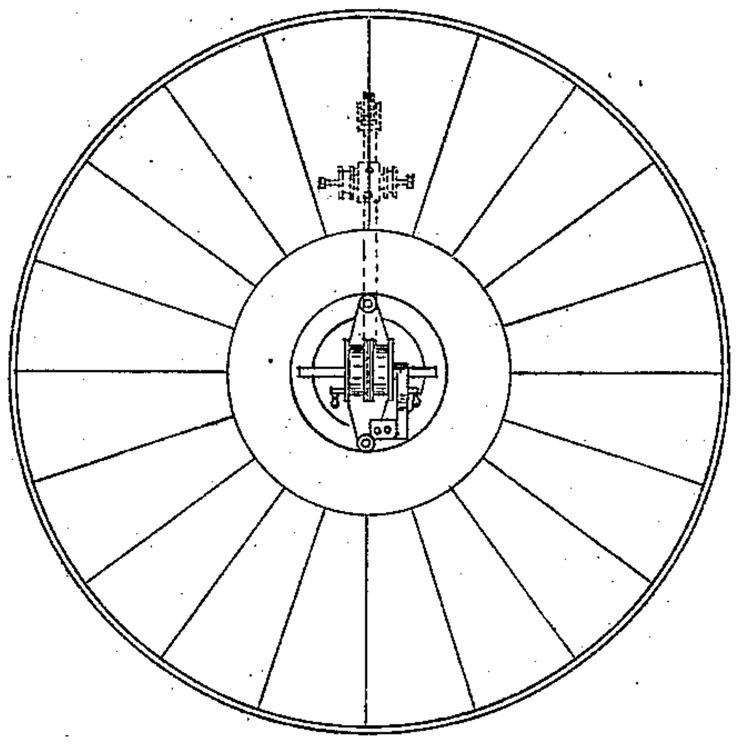

Fig 3

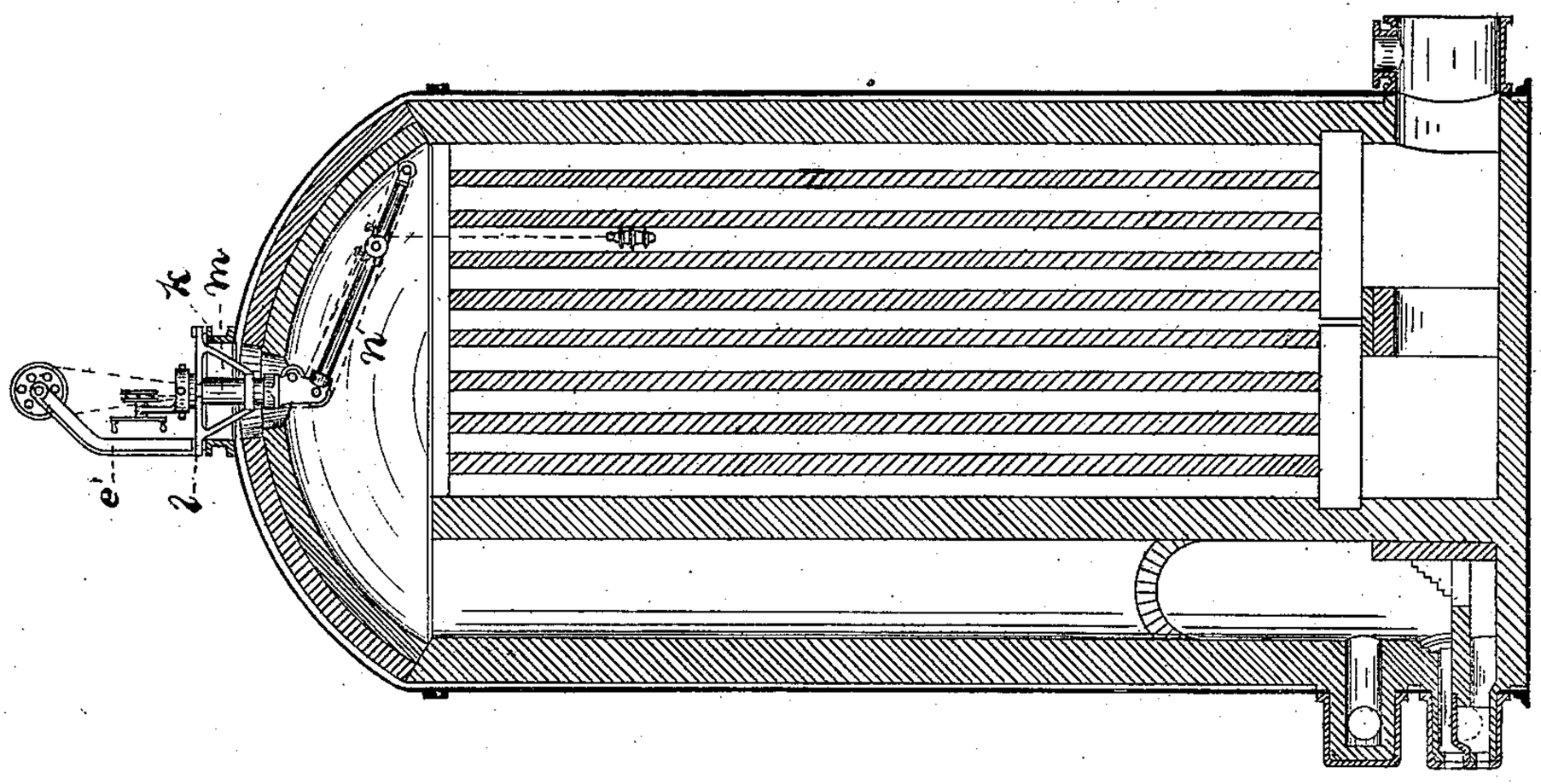

Fig 1

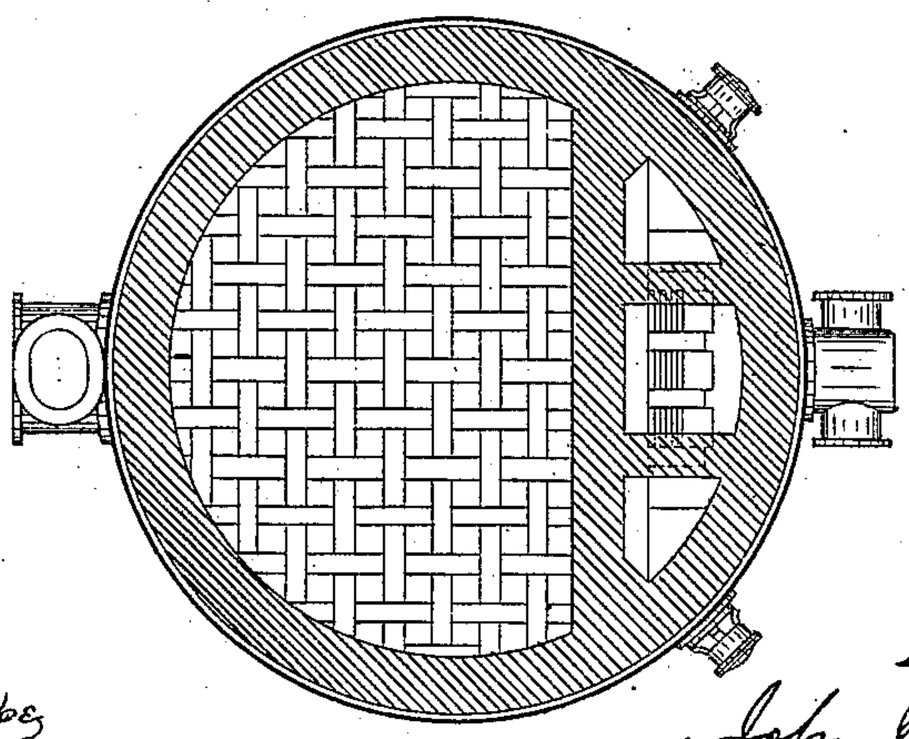

Fig 2

Witnesses
Samy C Phillipps
J. H. Gries

Inventor
John M Hartman

(No Model.)

2 Sheets—Sheet 2.

J. M. HARTMAN.

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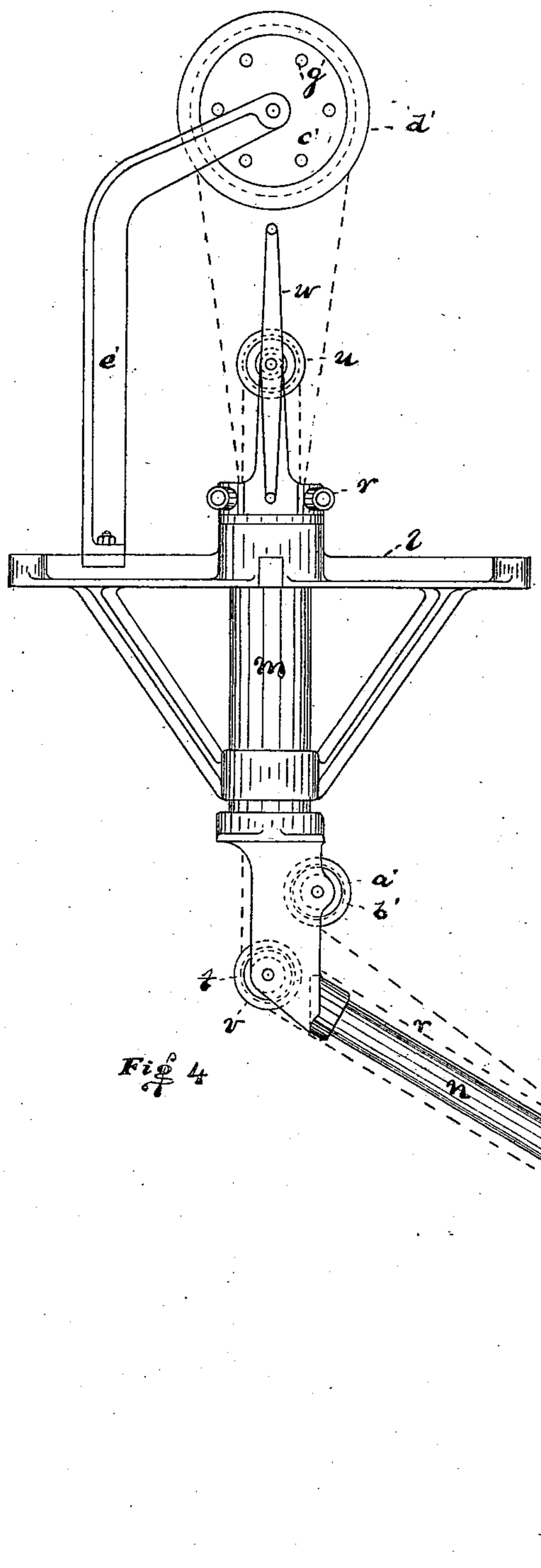

Fig 4

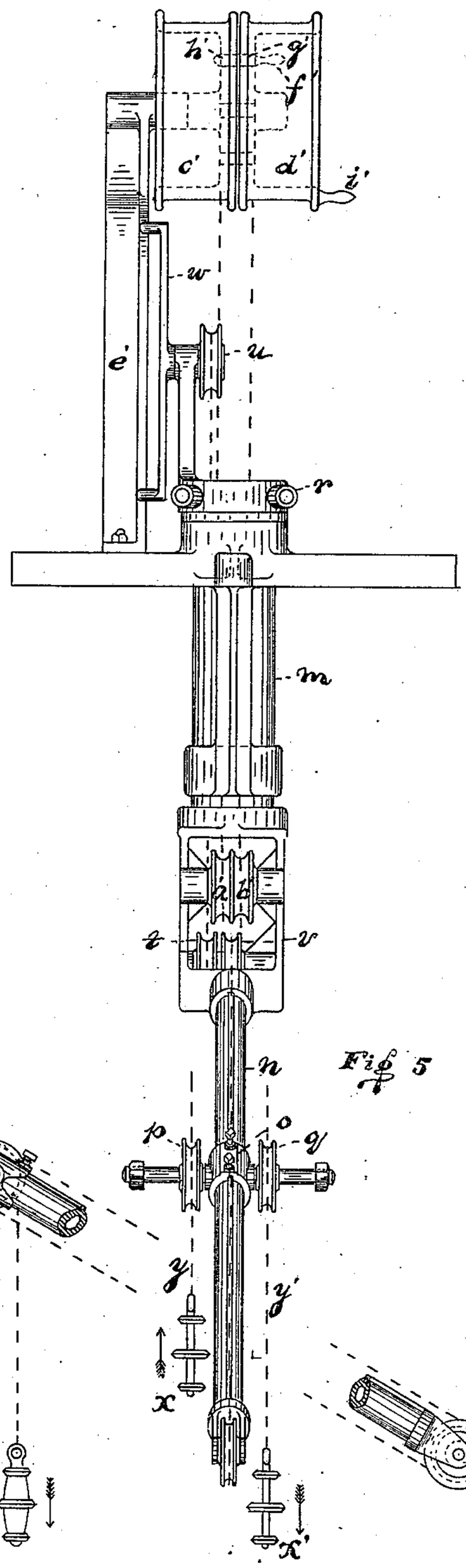

Fig 5

Witnesses
Harry C. Phillips
J. F. C. Fries

Inventor
John M. Hartman

UNITED STATES PATENT OFFICE.

JOHN M. HARTMAN, OF PHILADELPHIA, PENNSYLVANIA.

FLUE-CLEANER.

SPECIFICATION forming part of Letters Patent No. 253,862, dated February 21, 1882.

Application filed November 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. HARTMAN, of Philadelphia, Pennsylvania, have invented a new Improvement in Flue-Cleaners, of which the following is a specification.

This invention relates to improved means for cleaning the flues of regenerative or other stoves where the flues are covered and where there is no opening directly over the flues to allow the scrapers to be worked from the outside of the covering of the flues.

It consists of, first, a detachable double drum with chains; second, a pivoted arm swinging under the covering of the flues; third, a movable sleeve with two sheaves and roller-bearings. I attain these objects by the means illustrated in the following drawings, in which—

Figure 1 is a vertical section of a stove with the flue-cleaner in position. Fig. 2 is a plan of flue-cleaner and top of stove. Fig. 3 is a plan of the flues of a regenerative stove. Fig. 4 is a side elevation of the flue-cleaner. Fig. 5 is a front elevation of the flue-cleaner.

Similar letters refer to similar parts throughout the several views.

Heretofore various devices have been used for cleaning the flues of regenerative stoves by going inside of the stoves and passing weights or brushes attached to chains through the flues. This requires the stove to be cooled to allow the workman to go inside.

It has been proposed to combine a blow-off pipe and brush for cleaning the flues, as shown in E. A. Cowper's patent, February 7, 1871; but this has not proved successful, as there is too much trouble in coupling the air-pipe, which is in short sections, and which would require a workman to go inside of the stove. The air blown through this pipe is lost through the interstices of the walls and passes into the other flues without cleaning the flue through which it is passed. A sharp current must be maintained to remove the dust. It has been also proposed to clean the flues by a boom pivoted on the stove and swinging over the top of it. To this boom is attached a chain and weight to pass through the flues for cleaning them. This arrangement will clean any flues immediately under the doors on the top of the stove; but where a checker-work regenerator is used the number of openings is so great that only one-third of the checker openings or flues can be reached by this arrangement, as there is no means provided to carry the chain under the top of the stove for cleaning the flues between the door-openings. If a greater number of door-openings were placed in the top of the stove to get at more of the flues, the walls forming the top of the stove-lining would be so weakened that they would crush and be destroyed. I prefer to use a great number of flues, as per Fig. 2, which increases the heating-surface, and cover the stoves with a dome having but one door opening in the center at the top. This dome is lined with fire-brick and has an opening in it at the top under the above-mentioned door.

To clean the stove the above door is removed, the temporary brick stopper is taken out of the hole in the dome, and to the door-frame *k* is bolted the bearing *l*, which holds the vertical hollow shaft *m*. To this shaft is secured the arm *n*, which is free to swing around under the dome and over the regenerator-flues. On this arm *n* is placed a sleeve, *o*, carrying the two sheaves *p q*, which have a motion endwise on their bearings to enable them to move freely to a position central over the flue while the scraper is passing down the flue. When the chain pulls the weight up through an opening it should be kept clear of the flue-walls, or the chain will destroy them, as the fire-brick are soft, spongy, and easily crumbled. The end motion of the sheave will prevent this destruction of the walls.

To the sleeve *o* is attached a chain, *r*, which passing over the pulley *s* on the end of the arm, and from thence over the pulley *t*, and from thence over the pulley *u* to the outside of the stove, and from thence over the pulley *v* to the sleeve *o* again, the workman can move the sleeve to any desired point on the arm by turning the handle *w*.

To the scrapers *x x'* are attached the chains *y y'*, which pass over the sheaves *p q a' b'* to the double drum *c' d'*, which is supported by the bearing *e'*. This drum is made of two parts, *c' d'*, and connected by the pin *f*, passing through the hole *g'*. This pin can be quickly entered and the drum, connected at any point. When the pin is in the holes *g' h'*, say, the drum revolves as a whole; but when the pin is out of the holes the drums revolve separately. One end of each of the chains *y y'* is attached to this

double drum. The chain *y*, having been passed over the pulleys *a' p*, is attached to the scraper *x*, which is then let down through one of the flues until it reaches the bottom. The second chain is then passed over the pulleys *q b'* and attached to the scraper *x'*, which is then passed down another flue. The drum *d'* is now revolved by the crank *i'* and the scraper *x'* is drawn up to the top of the regenerator. The pin *f'* is then placed in two opposite holes, which connects the two drums. By revolving the drum as now connected one scraper descends as the other ascends, and two flues are cleaned by the same motion and in the same time that one flue is cleaned with all other arrangements. One scraper balances the other, which dispenses with counter-balances, sheaves, and chains used in other arrangements. Suitable handles are attached to the vertical shaft *m*, at *r'*, to revolve it. Friction-rollers are used in all the sheave-bearings to avoid friction and the use of oil, as the heat is so intense that the oil would be burned off.

I disclaim the use of an arm swinging over the top of a stove for cleaning the flues.

I do not claim the door on the top of the dome, except in combination with the flue-cleaner.

By this arrangement of a swinging arm under the dome and the scraper, as described, the stoves can be cleaned without cooling them down.

Regenerative stoves heat by the single-surface system. The heat is taken up from the burning gas on the surface of the brick forming the regenerator, and the heat is given out from the same surface to the current of air passing after the stove is reversed or put on a blow. These stoves are intermittent in operation and require two or more stoves for continuous heating. Pipe-stoves, where the heat is taken up on one surface, transmitted through the pipe, and given off on the opposite surface, belong to the double-surface system. They are continuous in operation.

The parts of the regenerative stove shown in Figs. 1, 2, 3 form no part of this patent.

I claim—

1. In combination with a regenerative stove, a flue-cleaner, with an arm, sleeve, and scraper swinging under the dome of the stove.

2. In combination with a regenerative stove, a flue-cleaner having an arm swinging under the dome of the stove, with the chains *r* and sheaves *t v s u* to change the position of the sleeve on the arm.

3. In combination with the flue-cleaner of a regenerative stove, the double drum *c' d'*, made in two pieces, the pin *f'*, the chains *y y'*, and scrapers *x x'*.

4. In combination with the flue-cleaner of a regenerative stove, the arm *n*, swinging under the dome, the hollow shaft *m*, the bearing *e'*, the drums *c' d'*, the sleeve *o*, the chains *r y y'*, the sheaves *t v s u*, the sheaves *a' b' p q*, and scrapers *x x'*.

JOHN M. HARTMAN.

Witnesses:
J. H. FRIES,
HARRY C. PHILLIPPE.