

C. SCHEMIOTH, dec'd.

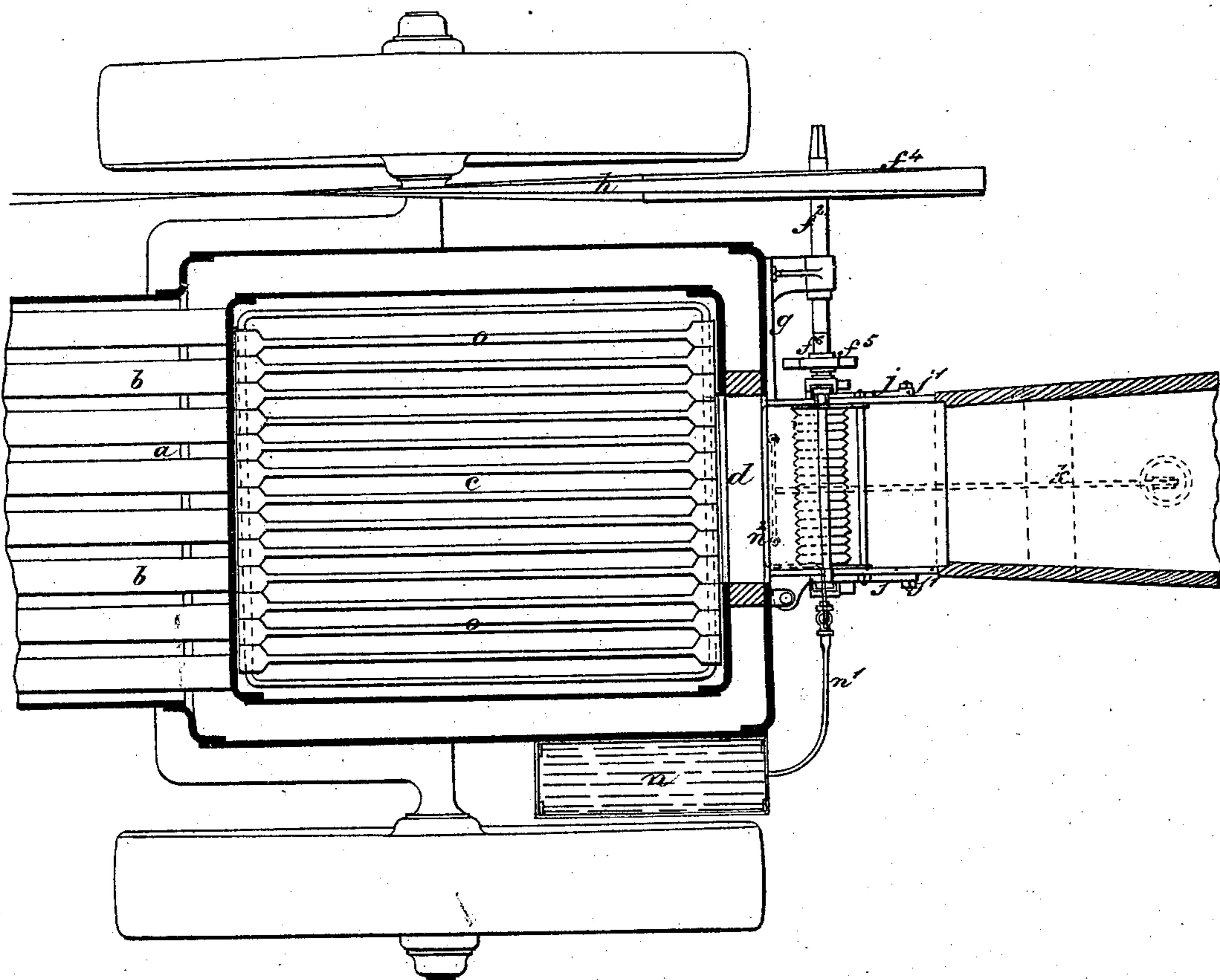
W. WESTLAKE, Adm'r.

Steam-Boiler and other Furnaces.

Patented Nov. 4, 1873.

No. 144,241.

Fig. 1.



Witnesses.
H. L. Bennett
W. H. Isaacs

W. Westlake
Administrator of Estate of
Casimir Schemioth
by his att.
C. L. Kenrick

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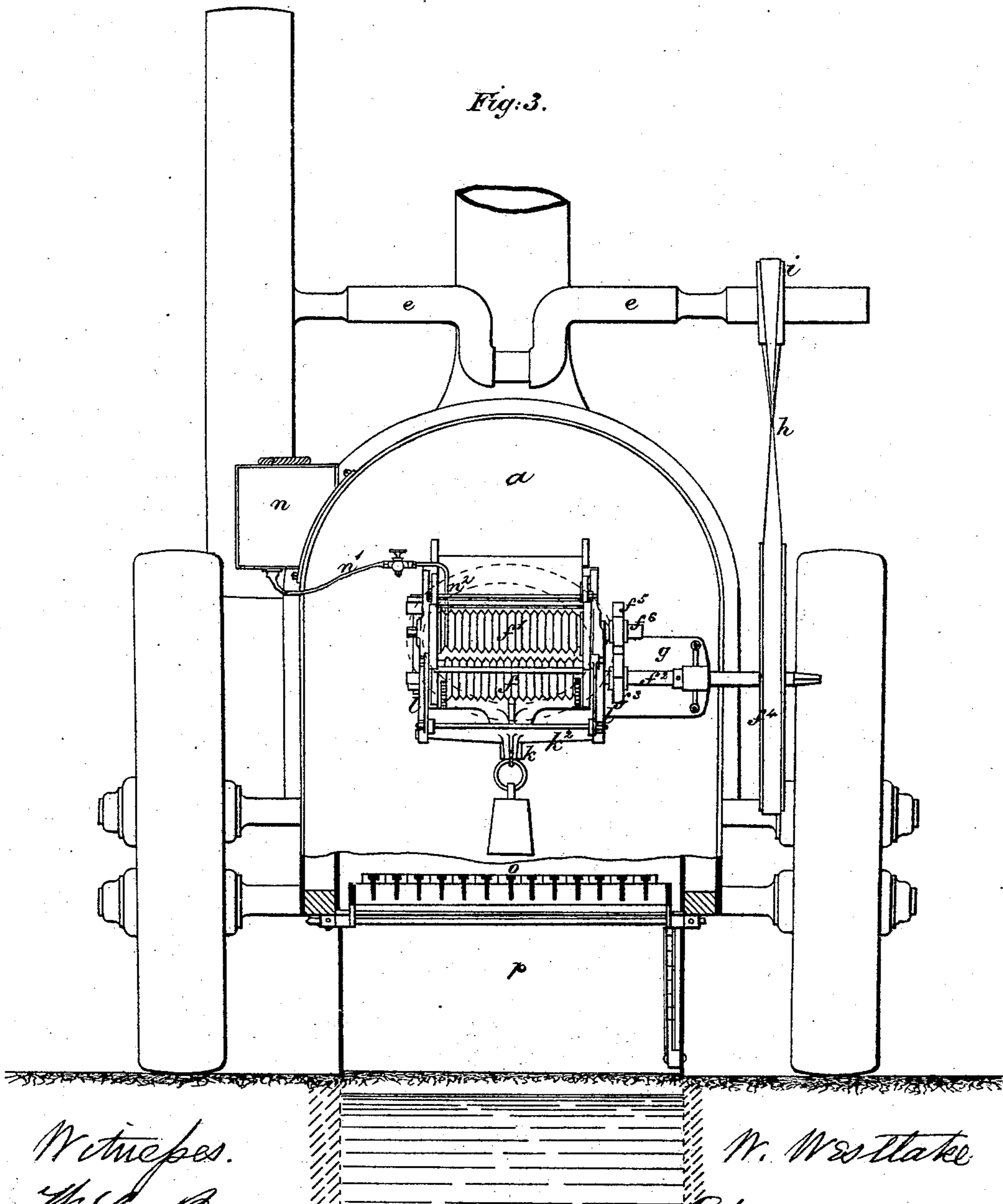
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Fig. 3.



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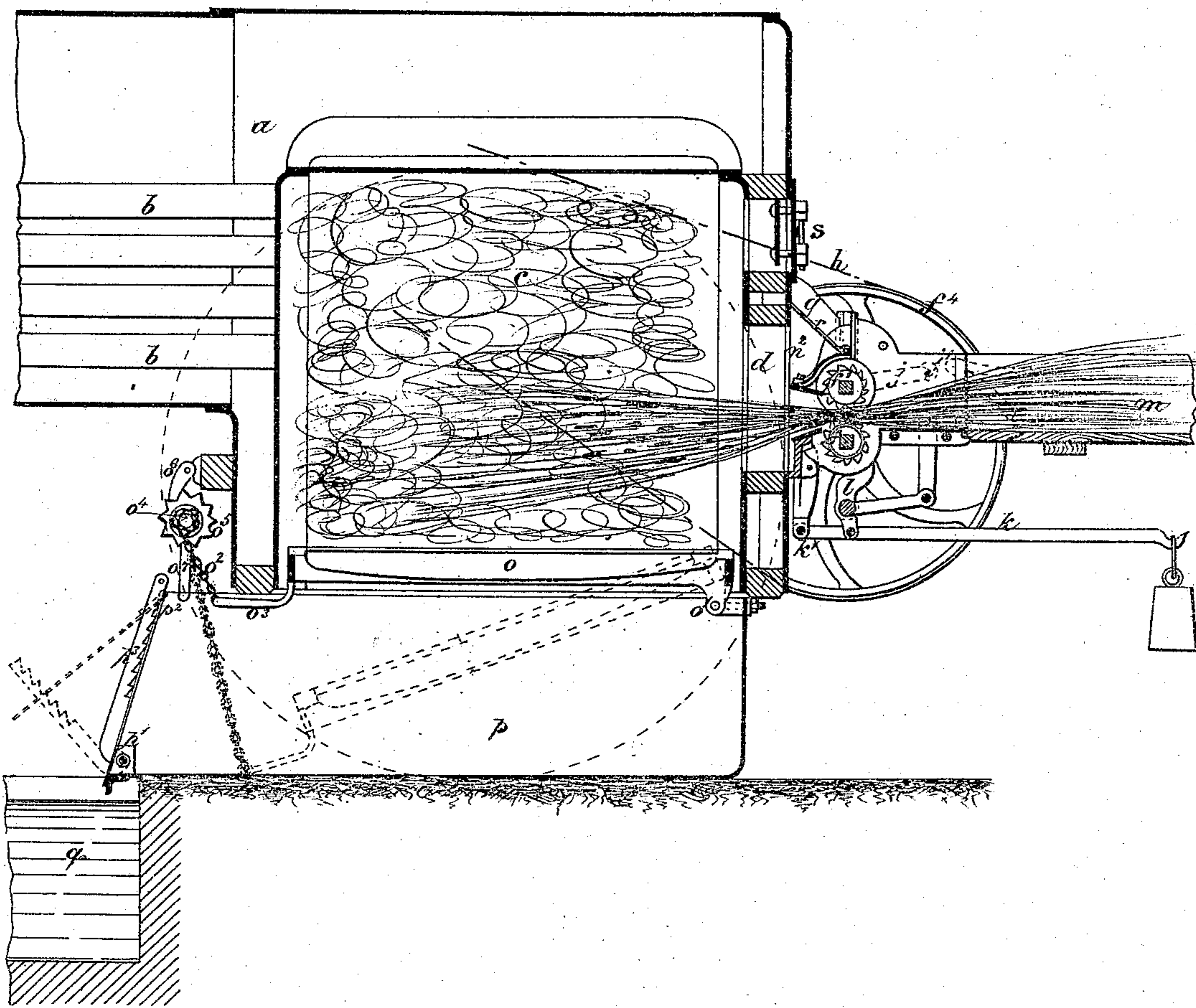
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Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM WESTLAKE, OF 65 MORNINGTON ROAD, REGENT'S PARK, (ADMINISTRATOR OF CASIMIR SCHEMIOTH, DECEASED,) ASSIGNOR TO JOHN HEAD, OF IPSWICH, ENGLAND.

IMPROVEMENT IN STEAM-BOILER AND OTHER FURNACES.

Specification forming part of Letters Patent No. 144,241, dated November 4, 1873; application filed August 6, 1873.

To all whom it may concern:

Be it known that CASIMIR SCHEMIOTH, deceased, late of Odessa, in the Empire of Russia, civil engineer, during his life-time invented certain Improvements in Steam-Boiler and other Furnaces, and in parts applicable thereto, to facilitate the combustion of straw or other light matters as fuel, of which the following is a specification:

The nature of the invention of the said CASIMIR SCHEMIOTH consists in facilitating the economic use of straw or other light matters, such as jute, cotton, or maize stalks, various grasses, and light vegetable fibers or roots, as fuel in furnaces. For this purpose moving or compressing surfaces are applied to or near the mouth of the furnace, between which the matters to be used as fuel are passed, and in being so passed are compressed as they pass to the furnace. The moving or compressing surfaces employed consist of rollers in pairs, and a single pair of such feed-rollers is found to answer well, though in some cases a series of them may be employed, in which case the pair next the mouth of the furnace will be closer together than the next pair, and so on to the outermost pair, which are placed the farthest apart—an arrangement by which a sort of double incline with traveling surfaces is obtained, the direction of motion of the surfaces of the respective rollers being toward the mouth of the furnace, the movements of the parts being by ordinary means. The matters to be consumed are placed on a table or surface next the feed-rollers, on one side thereof, while the feeding-mouth or fire-door of the furnace is at the opposite side of said rollers, so that the fibrous materials laid upon the feed-table are seized, compressed, carried forward, and projected through the furnace-mouth into the furnace.

In place of rollers, a pair or pairs of belts, bands, or other traveling surfaces may be employed.

The interior of the furnace is formed with a channel or channels, by which atmospheric air may be conducted to impinge on the surface of such fuel just within the mouth of the furnace. The passage for the introduction of the

atmospheric air to the interior of the furnace is formed with a shaft or support for the matters as they pass to the surface of the fire-bars; and in order that the invention may be fully understood, the following, with the aid of the accompanying drawings, is a description of the means pursued in carrying the same into effect.

Figure 1 shows a plan view, and Fig. 3 an end view, both partly in section, of some of the parts of a portable agricultural steam-engine, with improvements according to the invention applied to it.

In each of these views the same letters are employed to indicate corresponding parts wherever they occur, *a* being the body of the boiler, *b* the flue-tubes thereof from the furnace *c*, and *d* is the fire-door or opening for the feed of the fuel to be conveyed to the furnace *c*. *e* is the main or crank axle, receiving motion from the engines. All these parts are, however, of the ordinary character. *f* and *f*¹ are a pair of rollers, which, according to such improvements, act as the feed-rollers to feed the matters used as fuel through the mouth *d* of the furnace. The surfaces of these rollers *f* and *f*¹ are grooved or toothed, so as to enable them better, in nipping the matters between them, to draw such matters forward to the furnace as those rollers are caused to revolve in the direction of the arrows. The roller *f* is affixed to the axis *f*², which is supported to revolve in suitable bearings carried by the framing *g*; and this axis *f*² has affixed upon it a pinion, *f*³, and also a pulley, *f*⁴. The teeth of the pinion *f*³ take into the teeth of another pinion, *f*⁵, affixed on the axis *f*⁶, carrying the roller *f*¹. Rotary motion is given to the roller *f*, and thence, by the pinions *f*³ *f*⁵, to the roller *f*¹, by a strap or band, *h*, which passes partly around the pulley *i* on the crank or driving shaft *e*, and also partly around the pulley *f*⁴. The axis *f*⁶ of the roller *f*¹ is supported in the ends of arms *j* *j*, which, at their other ends, are capable of movement on pins *j'* *j'*. By this means the distance between the rollers *f* and *f*¹ is slightly variable to the quantity of matter fed between them, and the roller *f*¹ is capable of exerting a regulated pressure. The

amount of pressure exerted by the roller f^1 is capable of being controlled by means of the weighted lever k , which turns upon the fixed stud k^1 , and carries the cross-bar k^2 , the outer ends of which are connected to the lower ends of rods l , the upper ends of which bear upon the axis f^6 . m is a table, upon which the matters to be used as fuel are placed as they are conducted to the feed-rollers $f f^1$.

In some cases the combustion of the material to be supplied to the furnace c may be facilitated, and the heat evolved increased, by the admixture therewith of minute quantities of petroleum, or such like hydrocarbon oil, and such hydrocarbon is supplied from a reservoir, n , which may be placed in any suitable position, so as, by a pipe, $n^1 n^2$, to effect the desired supply. The part n^2 of this pipe, which though shown within the fire-door, may be placed exterior thereof, and is perforated with numerous fine holes to admit of the hydrocarbon or other inflammable oil dropping on the matters to be consumed in their passage to the furnace. If desired, the pipe n^2 may be placed to cause the hydrocarbon to drop on the matters while they are undergoing combustion in the furnace.

In order to carry out these improvements, the fire-bars o are formed to turn on a hinge-joint at o^1 , and they are held up in working condition by chains o^2 , one end of each of which is attached to arms o^3 from the fire-bars o , and rising from which they are wound onto, and at their other ends attached to, a roller, o^4 , which is provided with a ratchet-wheel, o^5 , the teeth of which are taken into by a stop, o^6 , so as to retain the roller o^4 , and consequently the bars o , in position; but, when desired, the furnace can be readily cleared by releasing the stop o^6 from the ratchet-wheel o^5 , and thus allowing the bar to tilt, as indicated by dotted lines in Fig. 4, when the contents of the fire-box c will fall into the ash-pan p , and may thence be removed into a water-tank at q . The

roller o^4 may be turned, for winding up the chains o^2 , by a handle, o^7 , or by a spanner, or otherwise. The ash-pan p is provided with a door, p^1 , which is capable of turning at its upper end on pivots or hinges p^2 , and is capable of being held open at variable distances by the toothed rod p^3 , as shown by dotted lines in Fig. 4, so as thereby to regulate the amount of air passing to the furnace between the fire-bars o . A channel, s , Fig. 4, for the admission of air to the fuel in the furnace, is also formed above the upper feed-roller, and this channel is fitted with an adjustable hinged flap, r , so that the flow of air can be regulated.

In some cases, the fire-door, or opening, d , for the supply of fuel to the furnace, may be formed lower down or nearer to the furnace-bars o , as indicated by the separate section of parts, Fig. 4. The same letters of reference are applied to this figure as to the others.

Several pairs of rollers or endless belts, or other traveling feeding-surfaces, may be employed; but one pair of feed-rollers is generally found sufficient. These feeding means, and parts immediately connected therewith, may be either permanently attached to the furnace and boiler, or be capable of simple attachment thereto by screw-nuts, or such like means, when required.

What is claimed as the invention of the said CASIMIR SCHEMIOTH is—

The combination and arrangement, substantially as before set forth, of the furnace, the furnace-mouth, the compressing feeding-surfaces, and the feed-table, said surfaces being arranged between the furnace-mouth and the feed-table.

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Witnesses:

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