

No. 837,712.

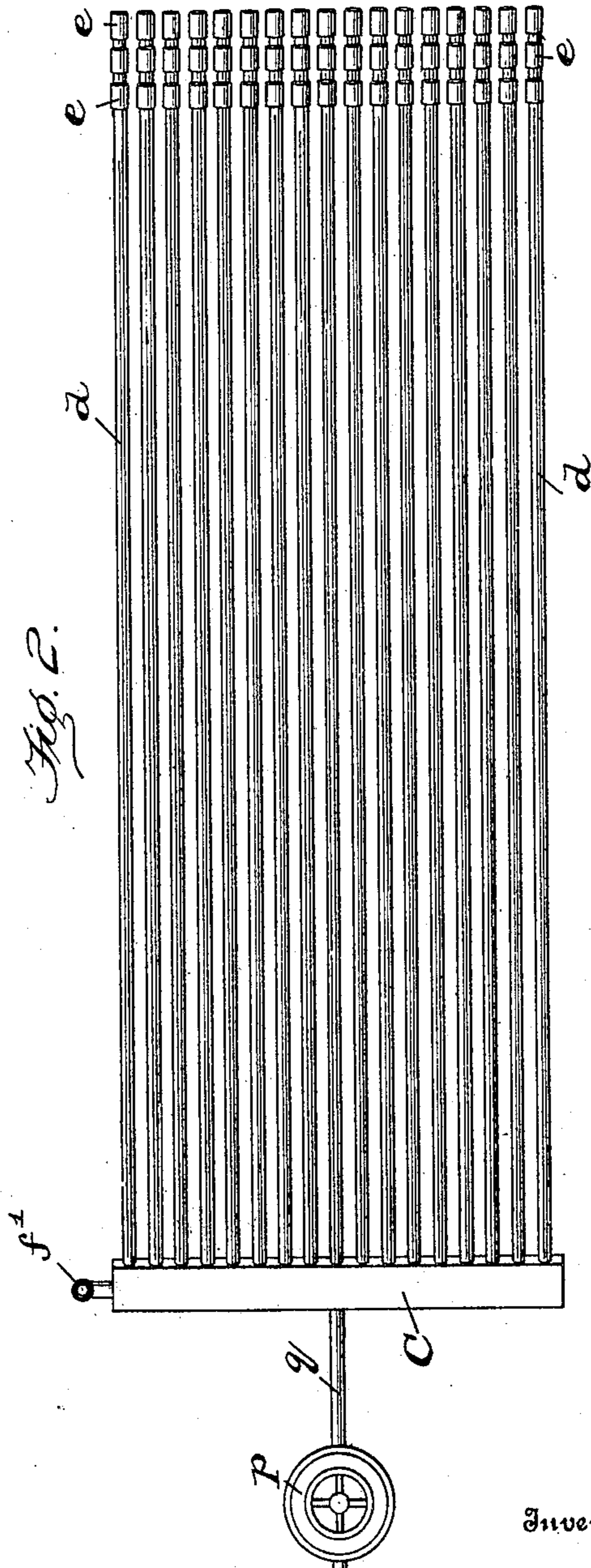
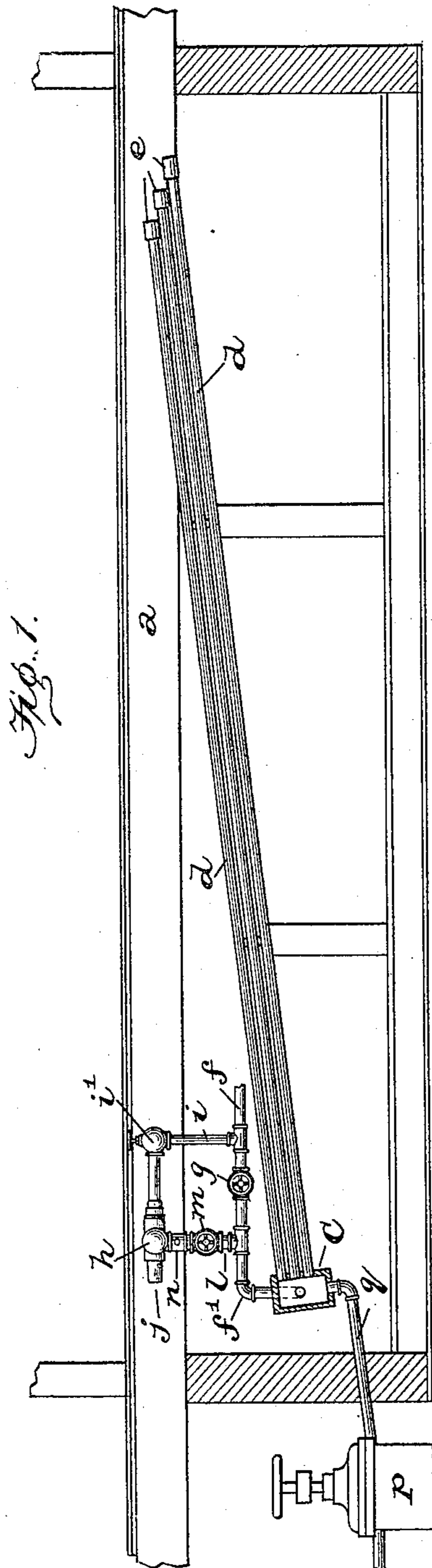
PATENTED DEC. 4, 1906.

J. F. OLDFIELD.

STEAM PIPE SYSTEM FOR HEATING DRY KILNS.

APPLICATION FILED AUG. 18, 1905.

2 SHEETS—SHEET 1.



Witnesses

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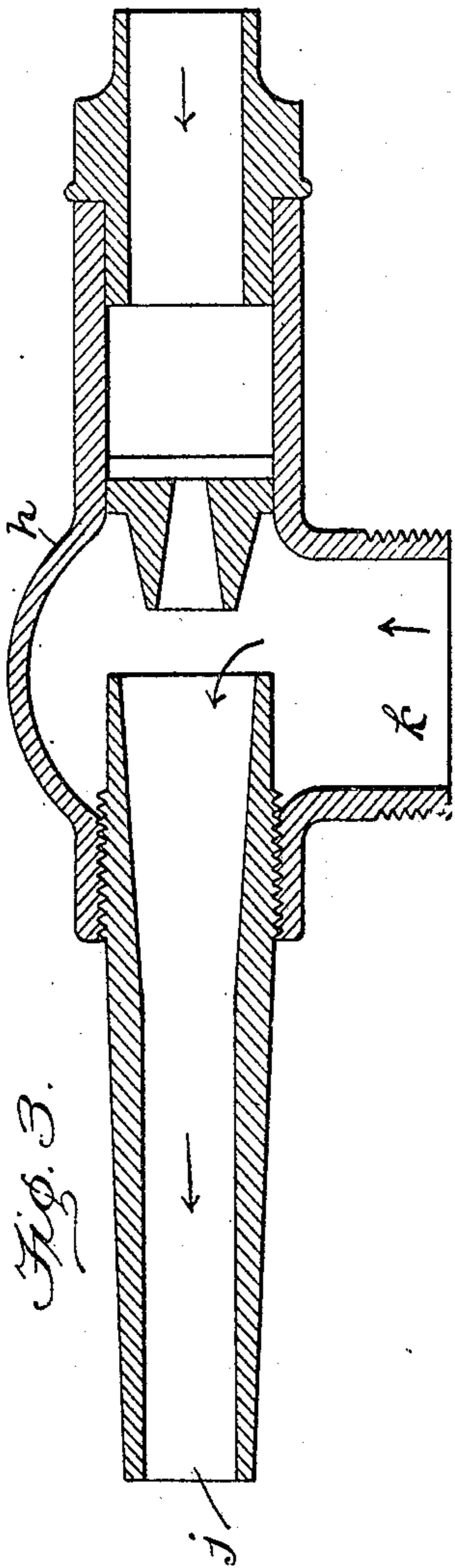


Fig. 3.

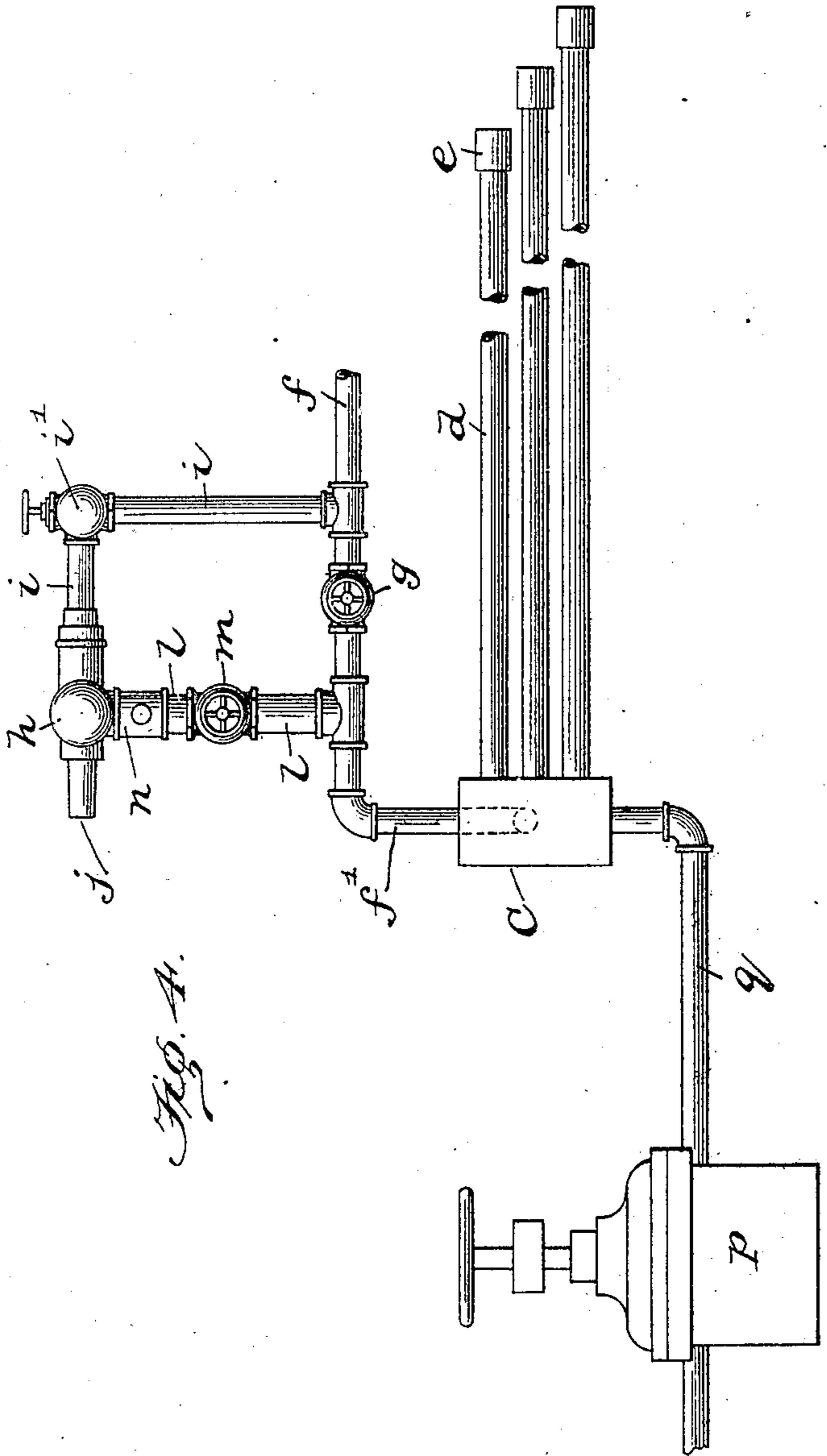


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN F. OLDFIELD, OF BALTIMORE, MARYLAND.

STEAM-PIPE SYSTEM FOR HEATING DRY-KILNS.

No. 837,712.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed August 18, 1905. Serial No. 274,681.

To all whom it may concern:

Be it known that I, JOHN F. OLDFIELD, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Steam-Pipe Systems for Heating Dry-Kilns, of which the following is a specification.

This invention relates to improvements in steam-pipe systems for heating dry-kilns.

One object of the invention is to provide straight lengths of radiating-pipe without elbows or bends and in which only one end of each pipe will be connected for the passage of steam, the other end being free or independent and closed, thereby obviating the difficulties arising from expansion and contraction.

Another object is to provide for exhausting the pipes of air before steam is admitted to them, the exhaust being effected at the same end of the pipes at which steam is admitted.

The invention is illustrated in the drawings herewith, in which—

Figure 1 is a vertical elevation showing the pipe system at the bottom of a kiln for drying lumber. Fig. 2 is a plan view of the pipe system. Fig. 3 is a longitudinal section of the ejector. Fig. 4 is a side elevation, on a larger scale, of a header, the radiating-pipes, the trap for the water of condensation, and the parts controlling the air-exhaust device and steam.

The dry-kiln system of steam-pipes must be located below the track-rails which extend through the building in order that trucks loaded with lumber and which move on said rails may pass over the pipes.

The track-rails will rest on the stringers *a*, extending through the building, and the straight radiating-pipes *d* extend longitudinally and are inclined below the stringers. The lower end of each pipe *d* is secured to and has communication with a steam-header *C*, and the higher end of each pipe is sealed or closed. In the present instance a cap *e* is employed to close the end. The entire length of each pipe is sealed or unconnected and is independent of all other pipes. The header *C* has three series of inclined radiating-pipes. The pipes of each series are in the same inclined plane, one series being above the other. The pipes of the lowermost series are the longest, and the end caps *e* project beyond the caps of the other two series. In like manner the pipes of the middle series

are longer than those of the uppermost series, and the end caps of the pipes of the middle series project beyond those of the upper series. This arrangement places each cap of the entire slot in an accessible position where a tool may be readily applied. Any suitable provision may be made for supporting these radiating-pipes.

A steam-pipe leads from a boiler (not shown) and connects with the header *C*. This steam-pipe is designated by the letters *ff'*, and a valve *g* controls or cuts off the supply of steam.

The air-exhaust device comprises an ejector *h*, attached to a branch pipe *i*, which has a valve *i'*. One end *j* of the ejector opens to the atmosphere, and the suction branch *k* of the ejector is attached to an exhaust branch pipe *l*, which has a valve *m*. It will be seen that the valve *g*, which controls or cuts off the steam to the header *C*, is between the two branch pipes *i* and *l*. A gage *n* is on the air-exhaust branch pipe *l* to denote the amount of vacuum that has been obtained in the header *C* and radiating-pipes *d*. The ejector has a well-known construction (shown in Fig. 3) and requires no special description.

A steam-trap *p* of well-known construction is employed, and a pipe *q* leads from the bottom of the header *C* to said steam-trap. Thus provision is made for carrying off the water of condensation from the radiating-pipes.

The operation of the apparatus is as follows: When it is desired to supply steam to the radiating-pipes *d*, the air in the pipes and in the header *C* will be exhausted by closing the valve *g* in the main steam-pipe and opening the valve *m* in the exhaust branch and, finally, opening the steam-valve *i'* in the first branch pipe *i*. This causes a flow of steam from the main pipe *f* through branch pipe *i* and through the ejector *h* and discharging at *j* to the atmosphere. The steam flowing through the ejector causes a suction or pull on its branch *k*, and thereby air is drawn from the pipe *f'*, header *C*, and radiating-pipes *d*. The gage *n* will denote the degree of vacuum. When the air has been sufficiently exhausted, the valve *m* of the exhaust branch must be closed, the valve *i'* to the ejector also closed, and the valve *g* in the steam-pipe opened. Thereupon steam from the boiler will fill the header and radiating-pipes *d*. The radiating-pipes, which have their free ends capped, are thus exhausted

of air from the same end (the lower end) at which steam is admitted.

This construction and arrangement of pipes with free ends capped and method of
5 first exhausting the air and creating a vacuum in the pipes and then filling the pipes with live steam results in producing the most effective heat at the capped ends.

This construction has practical advantages. Besides being cheaper, it is so simple
10 that the parts when shipped to any remote point may be set up without the services of an expert steam-fitter.

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

1. A steam-heating pipe system for dry-kilns, having in combination a steam-header; a plural number of pipes to radiate heat each
20 pipe having one end connected with said steam-header and the other end closed and unconnected; an air-exhaust device in connection with said steam-header for producing

vacuum in the said header and pipes by exhausting air from the same end of the pipes
25 at which steam is admitted, and a steam-supply pipe connected with the header.

2. A steam-heating pipe system for dry-kilns, having in combination a steam-header; a plural number of pipes to radiate heat each
30 pipe having one end connected with said steam-header and the other end closed and unconnected; a steam-supply pipe connected with the header; a steam-pipe branching from said supply-pipe; an air-exhaust pipe
35 branching from said supply-pipe; an ejector connecting with said two branching pipes, and a valve in the steam-supply pipe between the said two branch pipes.

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

JOHN F. OLDFIELD.

Witnesses:

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