(No Model.)

2 Sheets—Sheet 1.

H. B. LYNCH.

PIPE DRYING APPARATUS.

No. 561,713. Patented June 9, 1896.

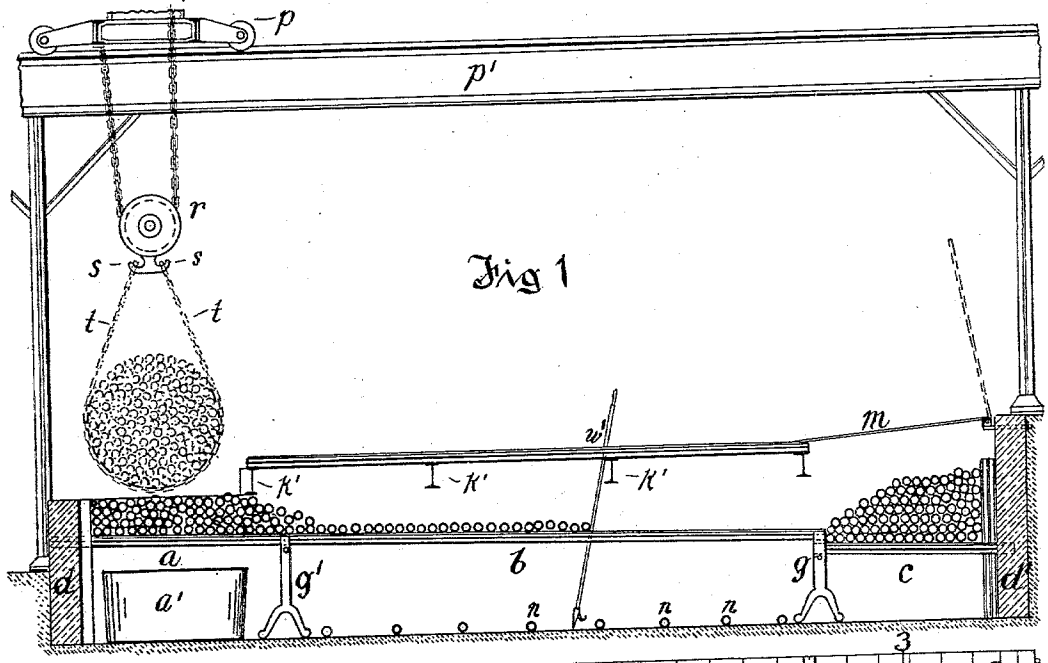

Fig 1

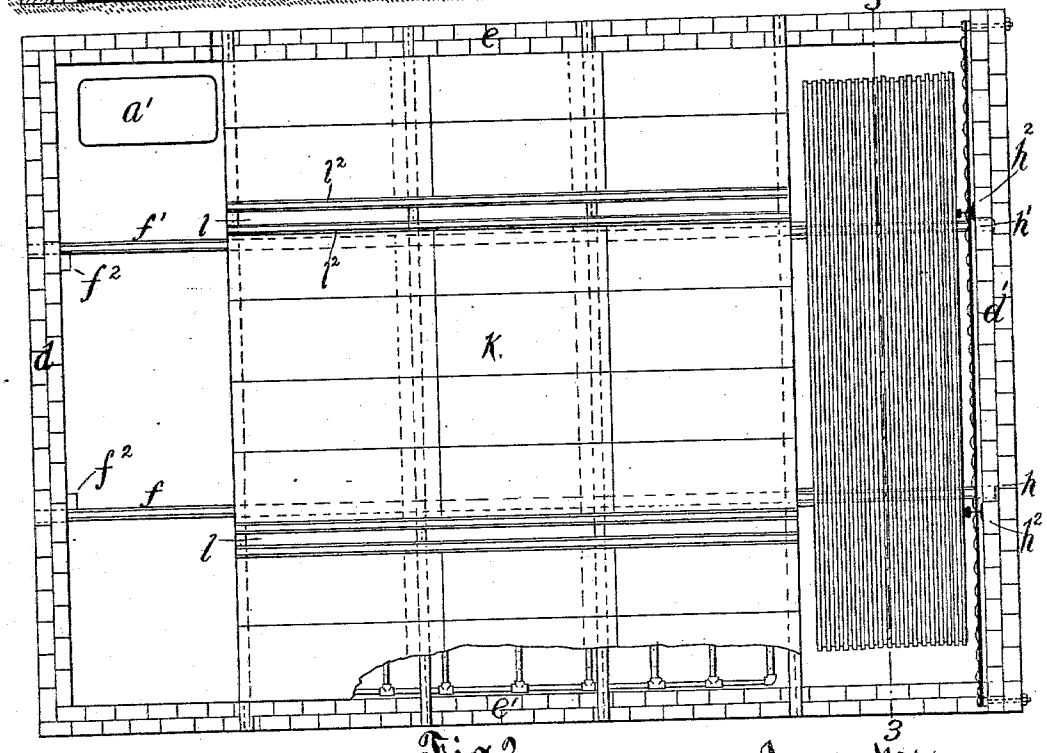

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

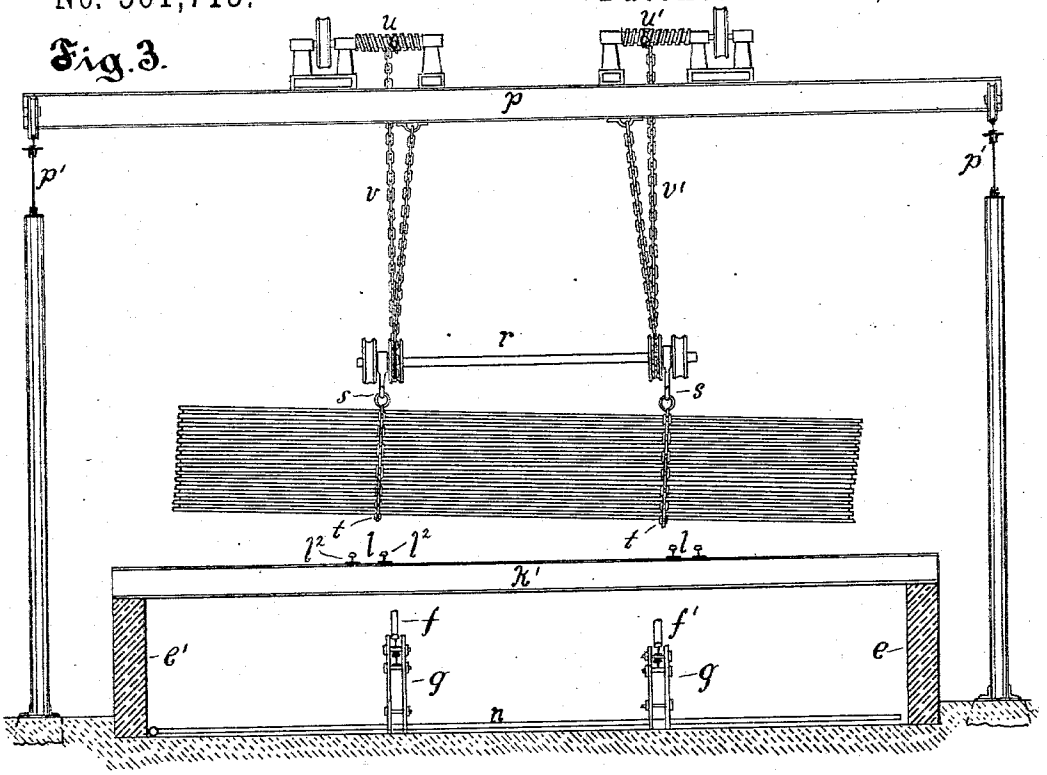
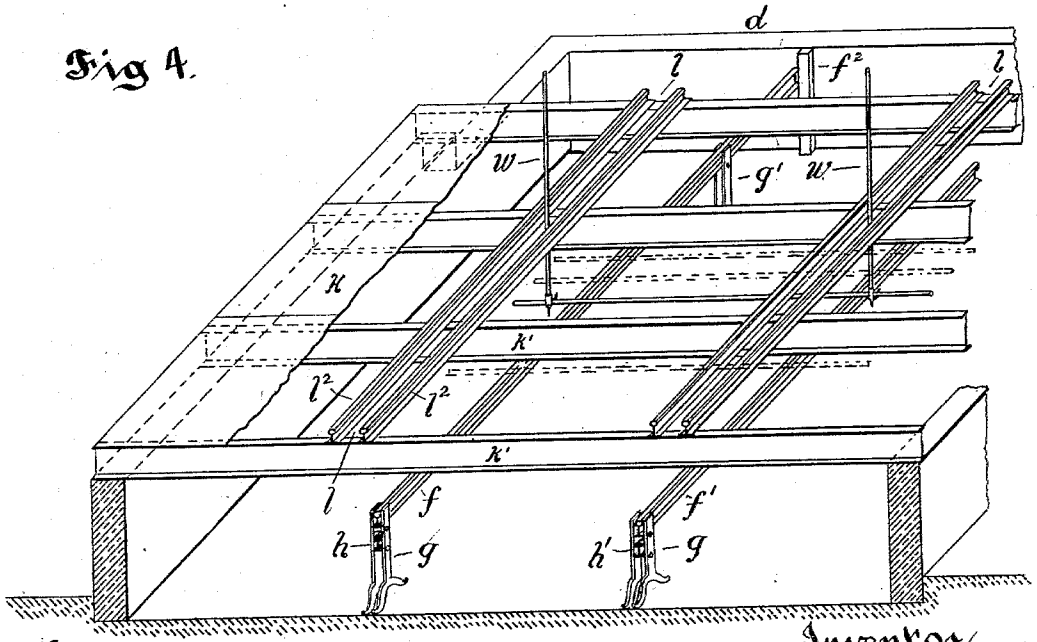


Fig 4.



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UNITED STATES PATENT OFFICE.

HARRY B. LYNCH, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO EDMUND C. CONVERSE, OF NEW YORK, N. Y.

PIPE-DRYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 561,713, dated June 9, 1896.

Application filed April 8, 1895. Serial No. 544,929. (No model.)

To all whom it may concern:

Be it known that I, HARRY B. LYNCH, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods of and Apparatus for Drying Pipe; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to ovens for drying pipe or bar previous to coating with metal.

Prior to coating pipe with metal it is necessary to remove the scale therefrom, and this is accomplished by first subjecting them to a bath of sulfuric acid, or, as it is termed, "pickling" them, then washing the pipe, and then inserting them in a suitable fluxing-bath, preferably formed of a solution of muriatic acid, to prevent the oxidizing of the cleansed surfaces. The pipe are then dried before inserting them in the bath of coating metal, such as in galvanizing or coating with other metals or alloys.

By an application filed of even date herewith, Serial No. 544,932, I have described a general method of preparing the pipe for coating with metal, in which the pipe are inserted in the different baths in bulk and carried to a drying-oven and passed through the same, and then carried to the coating-bath.

The present invention relates to part of the above general method, more particularly relating to the construction of the oven employed for drying the pipe.

The drying-oven forming the subject-matter of the application is provided with supporting-bars, and has a roof provided with longitudinal openings to permit the workmen to spread the pipe and direct their movement through the oven when supported on such bars, as well as certain other improvements in construction, as will be hereinafter more fully set forth and claimed.

To enable others skilled in the art to employ my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section of the drying-oven embodying the invention. Fig. 2 is a top or plan view, partly broken away. Fig. 3 is a section on the line 3 3, Fig. 2, showing the crane carrying the pipe in bulk to or from the oven; and Fig. 4 is a detailed perspective view illustrating the method of handling the pipe within the oven.

Like letters of reference indicate like parts in each.

In order that the method of operation may be more fully understood, I will first describe the construction of the oven. It is formed in what might be termed three "sections," the receiving-section *a*, the drying-section *b*, and the collecting-section *c*, these all being inclosed in the outer walls, the furnace having the end walls *d d'* and the side walls *e e'*. Extending from the end wall *d* through the receiving-section and drying-section are the pipe-supporting bars *f f'*, which are arranged at a slight downward incline from the wall *d*, so as to cause the rolling of the pipe, while, as shown in Fig. 3, the supporting-bar *f* is throughout its length on a higher level than the supporting-bars *f'*, so that the pipe are maintained within the oven at an incline to provide for the draining of the pipe; and it might also be stated that I prefer to have a tub or receptacle *a'* at one end of the receiving-section *a* to receive the mass of the drippings from the pipe. These supporting-bars are generally formed of railroad-rails, and are supported at suitable points by brackets, such as the brackets *g g'*, or they may be supported in any desired way. Extending from the brackets *g* at the lower ends are the supporting-bars *h h'* of the collecting-section, the rear ends of which are supported on the end wall *d'*, these bars *h h'* being placed at somewhat lower level than the lower ends of the bars *f f'*, so that as the pipes roll or are moved through the drying-section they are collected in the section *c* ready to be carried from the oven.

It will be noticed that the supporting-bars above described are in position to support the pipe some distance from their ends, so giving free opportunity for the placing of the chains around or removing them from the piles or bodies of pipe as they are carried to and from the oven. To hold the pipe from actual contact with the wall *d* when lowered into the receiving-section, I also provide the side bars

f^2, and I employ like side bars h^2 at the rear end of the collecting-section c, the bars being made of wood or metal, as desired. It will be noticed that the receiving-section a is uncovered. It is constructed to permit of the carrying of the pipe to the oven by the chains, the pipe being lowered by the chains into the receiving-section, as indicated in dotted lines in Fig. 1. The roof k extends over the drying-section, and it is supported by a series of beams k', extending between the side walls, the roof being covered with sheet or plate metal of sufficient strength to support the workmen while standing upon the roof. Extending longitudinally along the roof from the front to the rear ends thereof are the longitudinal openings l, which are formed by bars, such as rails l^2, placed on the beams k, leaving spaces between them through which the workmen can operate in moving the pipe through the oven, the operation of directing the movement of the pipe being shown more clearly in Fig. 4, long hooks or bars being employed for the purpose. To obtain access to the collecting-section, which it is preferred to keep covered during the ordinary drying operation, I provide it with the hinged roof portion m, which is shown as mounted on the rear wall d', and which, as indicated in dotted lines in Fig. 1 and shown in Fig. 2, can be swung up out of the way, so as to provide for the carrying of the pipe from the collecting-section by the crane.

Any suitable means for drying the pipe when in the oven may be employed—that is, any suitable way of generating the heat. I have found the simplest way, where gas is obtainable, to employ a series of gas-pipes, as at n, extending across the furnace under the supporting-bars $f\,f'$, so that the heat therefrom must necessarily rise through the pipes when resting on the bars. They are controlled by suitable valves, and they are perforated at intervals throughout their length, so as to burn the gas under the pipes, the heat therefrom passing up against the under surfaces of the pipes and between the same, providing an efficient way for drying the same. For the carrying of pipe, as described in the above-mentioned application, I employ a suitable overhead crane p, mounted on tracks p', and from the same hangs a suitable pipe-carrier r, having double hooks s, with which the chains t are connected, the chains being operated by any suitable power mechanism and it not being considered necessary to describe it further than to say that in its preferred form it has the two sheaves $u\,u'$, around which the chains $v\,v'$ are wound, the chains passing around sprockets on the pipe-carrier r, and thence upwardly, and being attached to the body of the crane. The construction of these parts is more particularly set forth in a companion application, Serial No. 544,930.

In the use of the above-described oven the pipe is carried to the drying-oven in bulk—that is, a large body of pipe, which in small pipe amounts, approximately, to ten tons—and after having been pickled and washed and subjected to the flux it is lifted from the flux-bath and carried to the drying-oven and the body of pipe then lowered into the receiving-section a until it rests upon the bars $f\,f'$. The chains are then removed and the pipe, as illustrated in the drawings, will either roll down the inclined bars, spreading themselves in a single layer throughout the oven, or where they will not roll along the drying-section and spread themselves therein the operator, by working through the longitudinal openings l in the roof by means of suitable hooks or bars w, can spread them along over the supporting-bars in the drying-section, and for this purpose, when necessary to check the movement of the pipe, can insert suitable bars, as at w', which rest against the oven-floor and against one of the cross-bars k', so checking the downward roll of the pipe. In this way a layer of pipe is spread out within the oven throughout the drying-section, and the pipe are thus carried in layer through the drying-oven, being subjected to the heat generated therein, and it is found that they can be rapidly dried, the drying, of course, being accelerated by the inclined position in which the pipes are supported on the bars $f\,f'$, as it not only provides for their draining, but the heat within the oven forms an upward current of heat through the interior of the pipe which will assist in drying such portion thereof. After one layer of the pipe has been subjected to the heat in this way the pipes are worked down along the drying-oven and the pipe which have not yet been subjected to the heat are spread out above them, and in this way the whole mass is gradually worked through the oven in layers and transversely of their length until they are collected in the collecting-section c. When the body of pipe is so collected, it is necessary to carry the crane over the collecting-section to raise the roof portion m and pass the chains around the pipe resting on the supporting-bars $h\,h'$, and then lift them therefrom and carry them to the coating-pot, where they are dipped in the ordinary way. In case it is found convenient to do so the coating-pot can be placed close to the end of the drying-oven and the pipe taken directly from the collecting-section, pipe by pipe, and inserted therein. This is only found desirable, however, where there is room for such way of locating the coating-pot.

I find that by this method of drying the pipe can be very rapidly handled and rapidly and thoroughly dried, and, further, that they can be dried without the necessity of dipping the pipe, so that there is no liability of the workmen being burned by the handling of the pipe when covered with muriatic acid. I also find that the movement of the pipe

through the oven can be directed by a couple of men and that a great saving in labor and cost as compared to the old way of drying is effected.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A drying-oven for pipe or bar having pipe-supporting bars, and having a roof provided with longitudinal openings to permit the workmen to spread the pipe and direct their movement through the oven when supported on said bars, substantially as set forth.

2. A drying-oven for pipe or bar having an uncovered receiving-section, a covered drying-section, and a collecting-section having a hinged roof portion, and having pipe-supporting bars extending through such sections, substantially as set forth.

3. A drying-oven for pipe or bar having an uncovered receiving-station, a covered drying-section having longitudinal openings in its roof and a collecting-section having a hinged roof portion, and having pipe-supporting bars extending through such sections, substantially as set forth.

4. A drying-oven for pipe or bar having a receiving-section, a covered drying-section, and a collecting-section beyond the drying-section, pipe-supporting bars extending along each of said sections, and vertical bars projecting beyond the inner faces of the end walls of the receiving and collecting sections respectively to hold the material therefrom and permit the introduction or removal of carrying means; substantially as set forth.

In testimony whereof I, the said HARRY B. LYNCH, have hereunto set my hand.

HARRY B. LYNCH.

Witnesses:
JAMES I. KAY,
ROBERT C. TOTTEN.