

(No Model.)

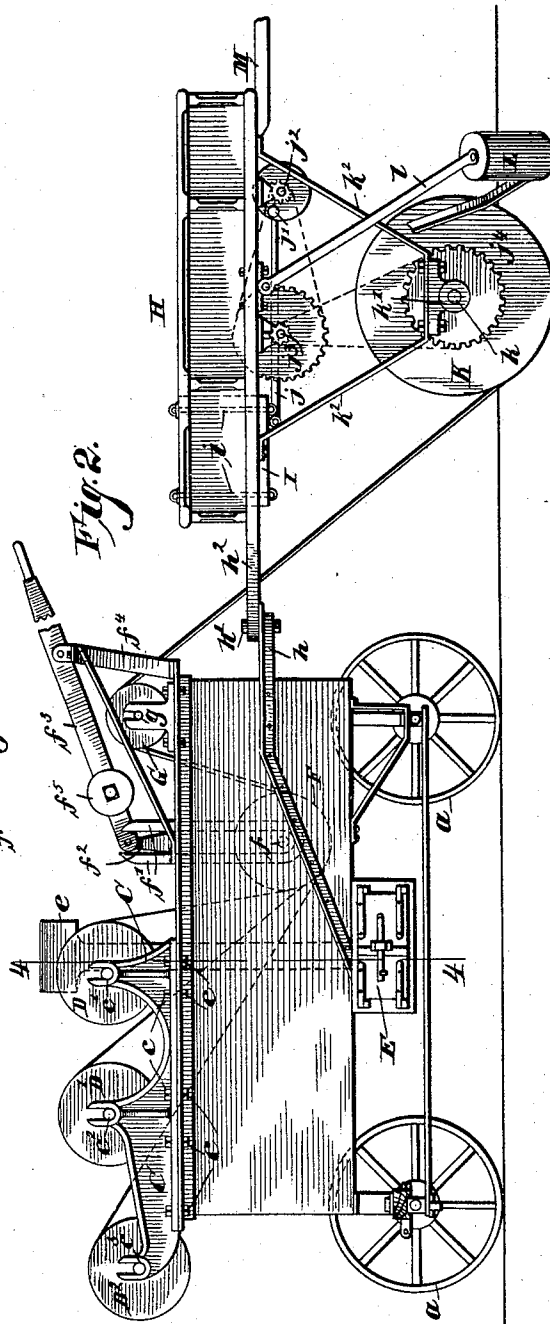
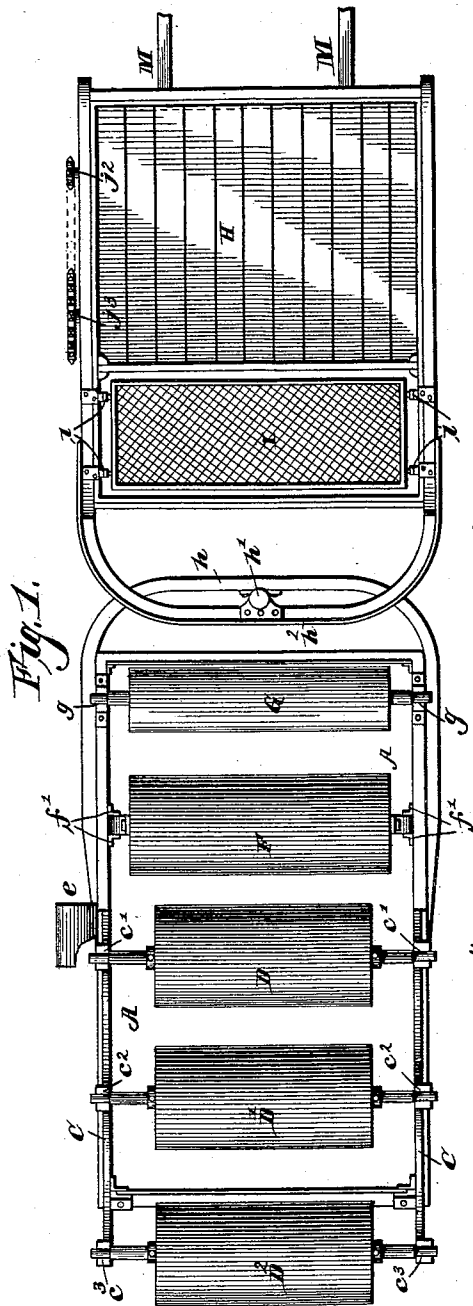
2 Sheets—Sheet 1.

C. H. LYON.

METHOD OF AND APPARATUS FOR LINING WATER CHANNELS.

No. 473,009.

Patented Apr. 19, 1892.



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Fig. 4.

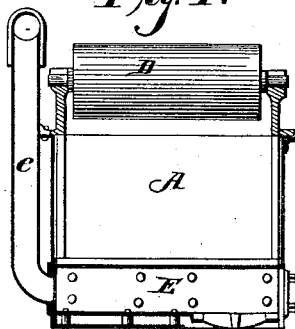


Fig. 3.

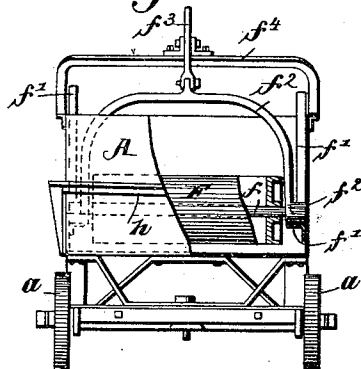
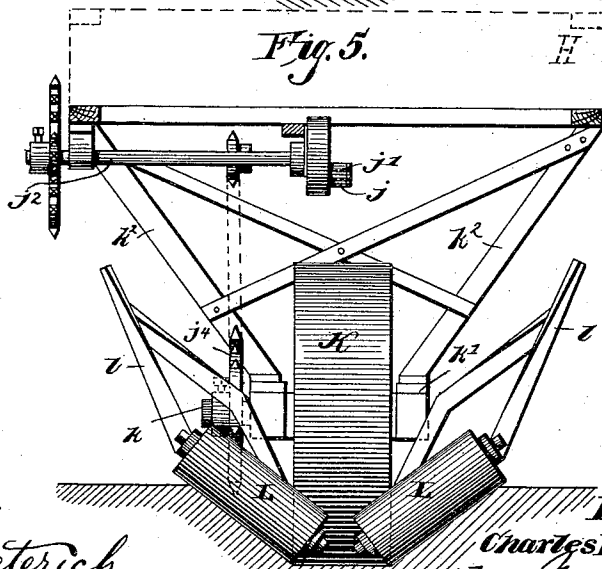


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES HUGH LYON, OF BALLANEE, NEAR BALLAN, VICTORIA.

METHOD OF AND APPARATUS FOR LINING WATER-CHANNELS.

SPECIFICATION forming part of Letters Patent No. 473,009, dated April 19, 1892.

Application filed August 27, 1891. Serial No. 403,860. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HUGH LYON, sheep-farmer, a subject of the Queen of Great Britain, residing at Ballanee, near Ballan, in the British Colony of Victoria, have invented an Improved Method of and Apparatus for Lining Water-Channels, of which the following is a specification.

This invention has been devised for the purpose of enabling irrigational and other water-channels to be lined in an inexpensive, durable, and water-tight manner, so as to prevent the waste of water by soakage, which is at present a source of so much loss to irrigationists.

It consists in feeding continuous lengths of brown paper, strawboard, or other similar material through molten tar, and from thence one above the other into the water-channel to be lined, said sheets being afterward pressed into place by means of a roller or rollers whose periphery or peripheries is or are formed to correspond with the shape of the channel.

The apparatus which I have devised for carrying my invention into practice consists of a tank for containing the molten tar, means for supporting the different rolls of lining material in position over such tar, guide-rolls for conducting the continuous lengths of lining material first under the surface of and then out of the tar and into the channel, a contrivance for delivering sand onto the lining material, and a roller or rollers for pressing the lining material tightly into the channel, as will be well understood from the following description, reference being had to the accompanying drawings, wherein—

Figure 1 is a plan, and Fig. 2 is a side elevation, of a complete apparatus for lining water-channels according to this invention. Fig. 3 is an end elevation of the receptacle containing the molten tar, part of the end of such receptacle being broken away to show the adjustable roller inside. Fig. 4 is a vertical transverse section on line 4 4, Fig. 2. Fig. 5 is a rear elevation of the sand-receptacle together with the rollers connected thereto.

The same letters of reference are used to indicate the same parts in all the figures.

A represents the tank for containing molten

tar, and C a bracket or casting secured to the top of said tank by bolts *c* or otherwise and formed with bearings *c' c' c'* for supporting the ends of the spindles or mandrels, upon which are wound the three rolls D D' D² of strawboard, brown paper, or other similar material with which the channel is to be lined. A fire-place or furnace E is provided underneath the tank A, in order that its contents may be maintained at the requisite temperature, a flue or chimney *e* being provided at one side of the tank and connected to the furnace E to carry off the products of the combustion.

Inside the tank A, beneath the level of the molten tar, is a vertically-adjustable roller F, whose spindle *f* is kept in position by a pair of fixed vertical guides *f'* on each side of the tank. This said spindle *f* works in bearings in the lower ends of a connecting-rod *f²*, which is curved as illustrated in Fig. 3, and extends from one end of said spindle to the other, and, moreover, projects up above the level of the molten tar at its center, where it is connected to the inner end of a long lever *f³*, which is fulcrumed upon a bracket *f⁴*, secured to the top of the tank A, and is provided with a heavy weight *f⁵*, whose position on the lever *f³* can be adjusted according to the force with which the roller F is required to be held beneath the surface of the tar.

At the rear end of the tank A is mounted a loose guide-roller G, supported in bearings *g* on the sides of said tank and serving to deliver the lengths of strawboard, brown paper, or other similar material which has been passed from the rolls D D' D² under the surface of the molten tar in the tank A. This tank, together with the various rollers and furnace supported on same, is mounted upon wheels *a*, which may be of any suitable construction and arranged in any convenient manner—such, for instance, as that illustrated in my drawings.

A curved rod or bar *h* is rigidly secured to the sides of the tank A and at about its center is fitted to receive a linchpin *h'*, passed through a bracket on another curved rod or bar *h²*, whose ends are correspondingly secured to the sides of a comparatively large shallow

receptacle H, containing a supply of sand. In the forward end of this receptacle a sieve or riddle I is suspended by loose rods i and is connected by a rod j with a crank-pin j' , projecting from a crank-disk on a shaft j^2 , supported in bearings underneath the sand-receptacle H. This crank-shaft j^2 is driven by chain gearings from an intermediate shaft j^3 , which latter has motion imparted to it from a sprocket-wheel j^4 on the shaft or spindle k of a comparatively heavy roller K, whose periphery is made of a shape to conform with that required to be given to the water-channel. The shaft or spindle k of this roller K also serves to support the sand-receptacle H, said spindle or shaft being passed through bearings k' on the lower ends of brackets k^2 , whose upper ends are rigidly secured to said sand-receptacle, as shown.

In cases where it is required to line a channel having a flat bottom and inclined sides, I prefer to employ a flat roller—such as K—for pressing the strawboard, brown paper, or other lining material down on said bottom, and to provide a pair of smaller rollers L L, each connected by rods l with the framing of the receptacle H in such a manner as that it will trail behind said larger roller K and will serve to press the lining material down into position against the inclined sides of the channel.

Under some circumstances it may be desirable to use a single roller for pressing the lining into position, in which case its periphery would be shaped to correspond with the channel. For instance, if the latter is required to be semicircular the periphery of said roller would be made semicircular, or if said channel is to be V-shaped then said periphery would be made V-shaped, as will be well understood.

A pair of removable shafts M are attached to the rear end of the sand-receptacle H to enable my improved apparatus for lining water-channels to be removed from one place to another.

The manner of employing my invention is as follows: The tank A is filled with tar, under whose surface the lengths of strawboard, brown paper, or other similar material are directed by the roller F, whereby, moreover, said lengths of material are compressed into one compact length, which is then led up over the roller G and from thence down under the rollers K L, whereby it is pressed onto the surface of the channel to be lined. This operation continues as the apparatus is drawn over the channel to be lined, and at the same time sand will be delivered from the sieve or riddle I onto the surface of the lining material, as clearly illustrated in Fig. 2, motion being imparted to said riddle from the main roller K by the connecting-rod j , crank-pin j' , and sprocket-gearing shown. By this means water-channels for irrigational and other pur-

poses can be inexpensively and yet efficiently made perfectly water-tight.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. The herein-described method of lining water-channels, consisting, essentially, in conducting continuous lengths of strawboard, brown paper, or other similar material under the surface of molten tar and then one above the other into the channel to be lined, and afterward pressing said material onto the surface of said channels by means of a roller or rollers, substantially as herein described and explained.

2. In apparatus for lining water-channels, a tank mounted on wheels and suitable feed, guide, and delivery rolls arranged to feed the material and to guide the same through and deliver it from the rear end of the tank, in combination with a pressure-roller for pressing the material onto the face of the channel, a sanding device mounted on the pressure-roller and adapted to deliver sand to the material before it passes under the roller, and a coupling device for coupling the roller and sanding device to the tank, whereby the last-named device is moved along by and with the tank through the pressure-roller, as set forth.

3. In apparatus for lining water-channels, a tank mounted on wheels and having a fireplace below the bottom thereof, in combination with a plurality of rolls, such as D D' D², and a guide-roll, such as G, mounted on the tank above its upper edge, said tank being provided with vertical slotted guides, such as f' , a weighted lever fulcrumed on the tank, a U-shaped connecting rod or yoke, such as f^2 , having spindle-bearings formed in the lower end of its vertical arms, said arms being guided in the slotted guides f' , and a roller loosely mounted in said bearings, substantially as and for the purpose set forth.

4. In apparatus for lining water-channels, an apparatus for pressing the tarred material upon the faces of the water-channel and sanding the outer surface of such material, comprising a compressing roller or rollers, a sand-receptacle supported from one of said rollers and having a portion of its bottom at one end formed by a sieve adapted to vibrate or shake, and actuating mechanism controlled from the supporting-roller and adapted to impart a vibratory motion to the sieve, substantially as and for the purpose set forth.

5. In apparatus for lining water-channels, the combination, with a tank mounted on wheels and provided with means for heating the contents thereof, one or more feed-rolls and a delivery-roll mounted on the tank above the upper edge thereof, and a guide-roll mounted within said tank, of means for press-

ing the material delivered by the delivery-
roll to the faces of the water-channel and
sanding the outer surface of said material,
comprising one or more compressing-rollers,
5 a sand-receptacle mounted on one of said
rollers, a vibrating sieve forming a portion
of one end of the bottom of the said recep-
tacle, intermediate mechanism operated from
the supporting pressure-roller to impart a

vibratory motion to the sieve, and coupling 10
devices for coupling the two apparatus to-
gether, substantially as and for the purpose
set forth.

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