J. PERRY.

Mode of Securing Flexible Roofing to Roofs.

No. 166,296. Patented Aug. 3, 1875.

Fig 1.

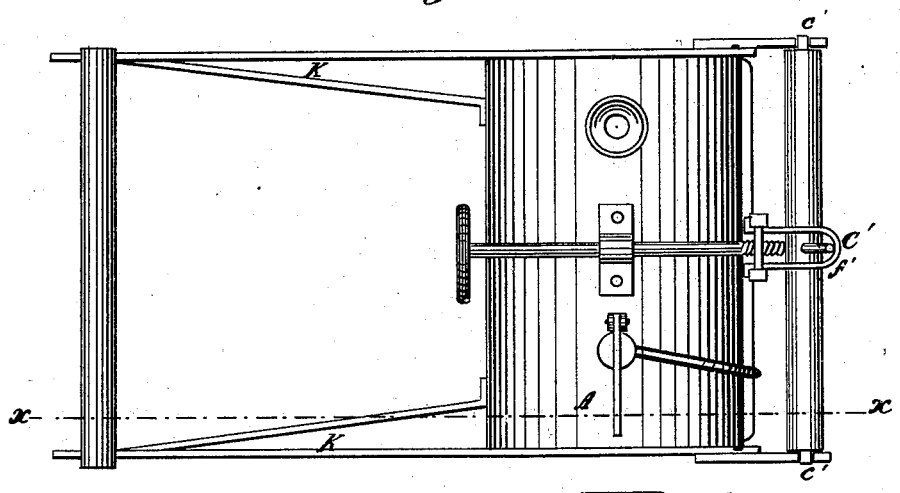
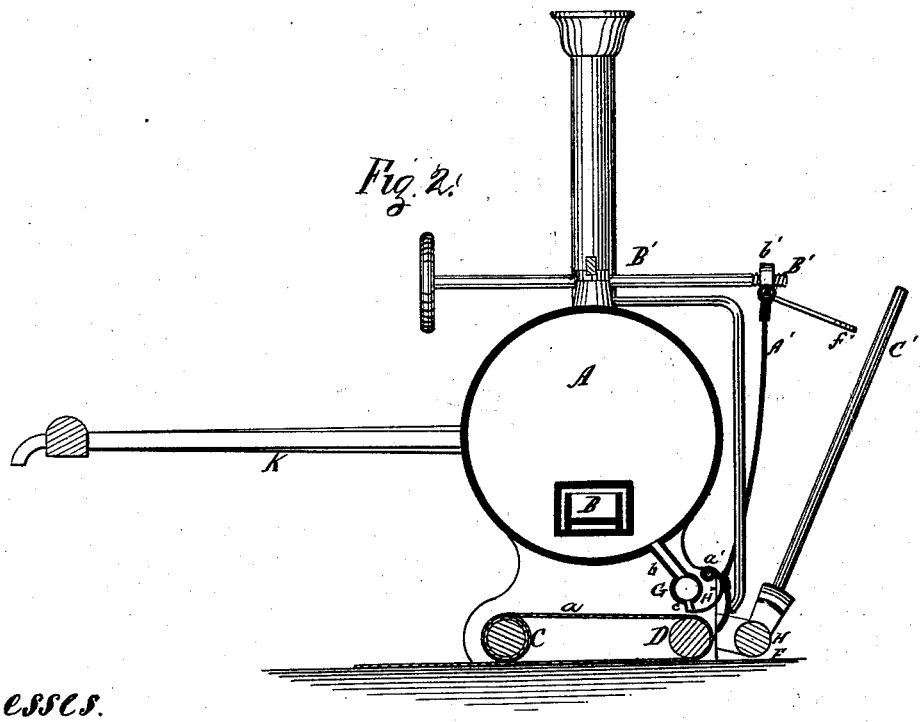


Fig. 2.



Witnesses.

W. M. Edwards

Wm. R. Whitney

Inventor.

James Perry

per

James A Whitney

Atty

UNITED STATES PATENT OFFICE.

JAMES PERRY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN MODES OF SECURING FLEXIBLE ROOFING TO ROOFS.

Specification forming part of Letters Patent No. **166,296**, dated August 3, 1875; application filed October 2, 1874.

To all whom it may concern:

Be it known that I, JAMES PERRY, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Means for Securing Flexible Roofing to Roofs, of which the following is a specification:

It has been found practically impossible to cement sheets of roofing material to roofing-boards by coal-tar used simply in a boiling condition without particular attention to the temperature of the sheets and of the boards upon which they are to be secured. For this reason it has become common to first secure the sheets upon the boards by means of tacks, or at intervals by patches of the tar or cement, and then pour the molten tar upon them, with the futile idea that the tar will permeate the sheets through to the boards, and cause their firm adhesion to the latter. Much trouble results from this imperfect method of attaching the sheets upon the roof, any leak through the sheets permitting the water to work its way underneath a large area, to ultimately destroy the roof, and in many cases to cause immediately drip through the crevices of the roofing-boards. My invention is designed to obviate all this by providing for the strong, firm, and intimate cementing of the sheets to the boards; my invention consisting, to this end, in a novel method or process of applying the tar or cementing material to the sheets and boards under certain conditions requisite, but hitherto unknown and untried in the art to which my said invention relates. My invention further comprises certain novel mechanism, whereby my aforesaid process may be successfully carried into practice.

Figure 1 is a plan view, and Fig. 2 a vertical longitudinal sectional view, of an apparatus included in my invention.

In the drawing I represent an apparatus which may be employed in carrying my aforesaid process into practice.

As hereinbefore indicated, the simple application of boiling tar between the surfaces of roofing-sheets and roofing-boards to cement the former to the latter will not effectually secure its object. This arises from the fact that when the sheets and boards, at ordinary temperatures, come in contact with the tar, as ordinarily applied, they abstract therefrom a percentage of heat sufficient to measurably destroy its fluidity, and, consequently, its penetrating power. The tar, therefore, merely adheres superficially to the sheets and boards, instead of permeating them to a greater or less depth; but I have discovered that by applying the tar to the sheets at such temperature as will insure the permeation of the surface portion of the sheets without materially reducing the temperature of the tar, and, at the same time, warming or heating the surface of the boards to prevent them from absorbing heat from the tar, the said boards will also be impregnated to a greater or less degree when the saturated sheets are brought down upon them; the tar, as it cools or solidifies, causing the sheets to cohere firmly to the boards.

In carrying my process into practice, I first melt and heat the tar to any desired temperature by any suitable appliances. I then place any requisite quantity of this heated tar in the receiver A of the apparatus (shown in the drawing) which receiver has underneath or within it, at B, a heater of any appropriate or approved construction. The web *a*, of sheet material or flexible roofing to be laid on the roof-boards, is coiled on a shaft or spindle, C, whence it passes over a roller, D, around and underneath the latter to the roof-boards, (indicated at F,) upon which it is to be placed, the apparatus being moved over the roof-boards in the direction shown by the arrow. The molten tar (superheated, so to speak, to the requisite degree by the heater B) flows through pipes *b* to a sub-reservoir, G, and thence through a series of pipes, *c*, arranged in a row longitudinal with the roller D, to and upon the surface of the web *a* of roofing material, the surface of said material receiving the tar being brought downward upon the roof-boards as it runs around and from the roller D in the operation of the apparatus. An adjustable valve, H*, regulates the flow of tar upon the material, and thus insures its proper distribution upon the said surface. This valve, it will be noted, is pivoted at *a'*, and provided with an upwardly-extending arm, A', which carries at the top a nut, *b'*. A horizontal screw, B', works through this nut,

in such manner as to enable the valve to be accurately adjusted at a greater or less distance from the ends of the pipes *b* as the web passes around and below the roller D, as hereinbefore explained. When desired, the valve may wholly close the said pipes when not in use. Arranged in advance of the parts hereinbefore mentioned is a roller, H, which, when the apparatus is in use, is made hot by any suitable means. This roller is journaled in suitable bearings *c'*, provided upon the lower part of the apparatus, and may have a handle, C', which is ordinarily held upright by a loop, *f'*, affixed to the top of the receiver A. The object of this handle is to enable the roller H to be detached and worked separately under those exceptional circumstances where such may seem desirable. The function of this roller, as it runs upon the roof-boards in advance of the laying of the roofing, is to heat the roof-boards sufficiently to insure the permeation of them by the hot and molten tar, the sudden chilling of the tar as the roofing is brought in contact with the roof-boards being by this means prevented. It will be seen that the roofing coated with the hot tar, or equivalent cementing material, is forced hard down upon the warmed surface of the roof-boards by the forward movement of the machine, which latter may be moved forward by the rearwardly-projecting handles K.

It will be seen that the molten tar, being highly heated and projected against or brought in contact with the sheet material itself, suffers no considerable reduction of temperature or any appreciable loss of fluidity. Meanwhile the roof-boards, having been heated by the contact of the hot roller H, are prevented from withdrawing heat from the tar, at the same time that the surface portions of the said boards are dried and brought into the condition most favorable to the absorption of the tar. As a consequence, a portion of the tar being absorbed above by the sheet material, and another portion below by the boards, with a layer of the tar between, the solidification of the tar perfectly unites the sheets (or sheet material) to the boards, so that the permeation or passage of water or moisture between is rendered impossible.

It must, furthermore, be kept in mind that by this my improved process, just sufficient of the tar, mastic, or cementing material is used to firmly cement the sheets to their place, any redundance of such material (which is always detrimental to the roof, for the reason that the surplus melts in hot weather, and flows in a rolling manner down the roof, underneath the sheets, to separate them from the roof-boards) is effectually avoided.

What I claim as my invention is—

1. The improved process of laying sheet material upon the roof-boards of roofs by applying the molten coal-tar or cement to the sheet material simultaneously and in conjunction with the application of heat to the roof-boards, substantially as and for the purpose set forth.

2. The organized machine for laying flexible roofing, comprising the receiver A, the roller C, for carrying the web, and the roller D, provided beneath the system of pipes *c*, constructed for use substantially as and for the purpose set forth.

3. The combination of the roller H with the organized machine, constructed for operation as set forth, for the purpose specified.

JAMES PERRY.

Witnesses:

JAMES A. WHITNEY,

ADOLPHUS NICOLLET.