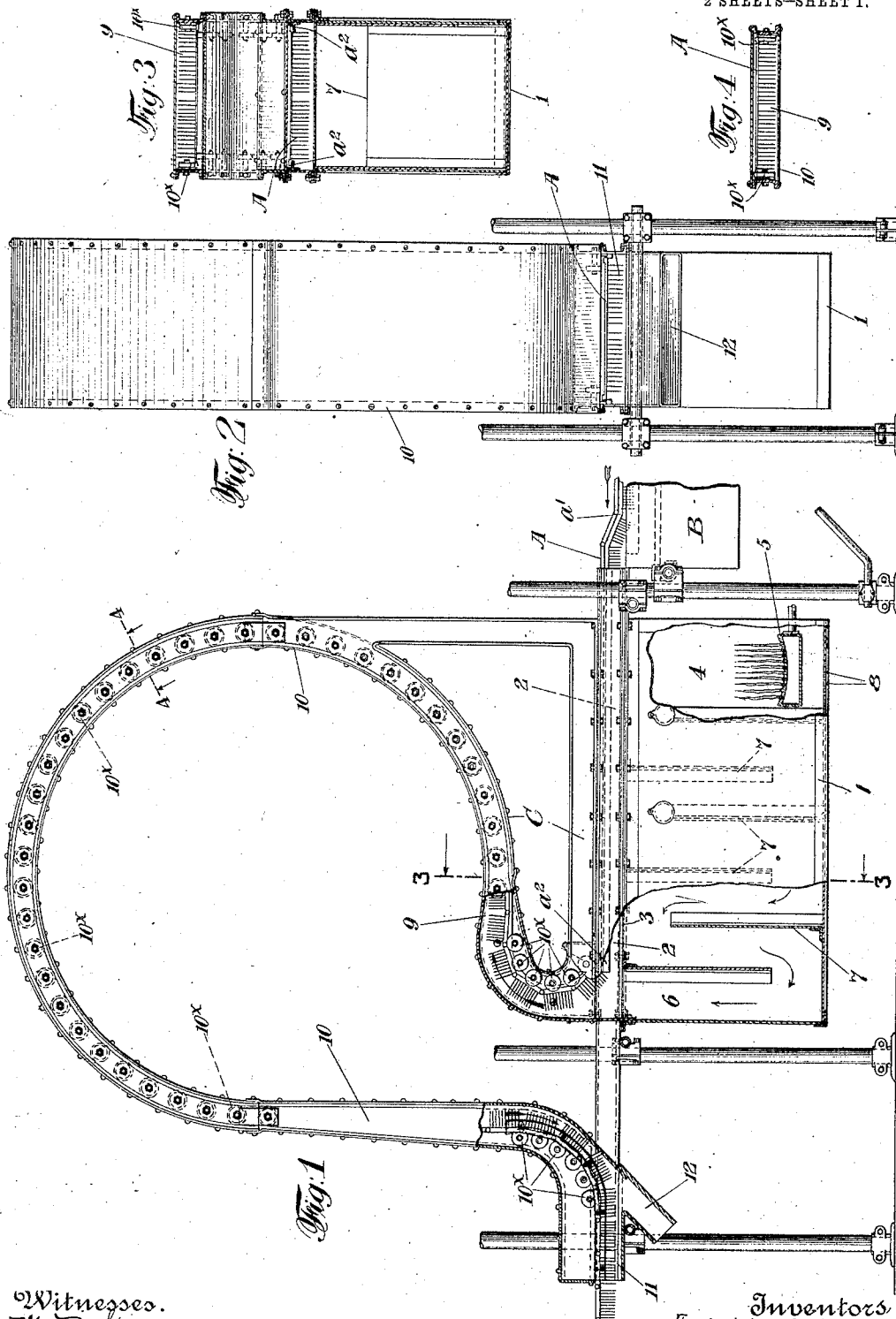


F. VAN D. CRUSER & W. GREEN.
 SPLINT DRYING MECHANISM FOR MATCH MACHINES.
 APPLICATION FILED JUNE 21, 1912.

1,044,146.

Patented Nov. 12, 1912.

2 SHEETS—SHEET 1.



Witnesses.
 M. B. Goewey.
 J. R. C. Griffin.

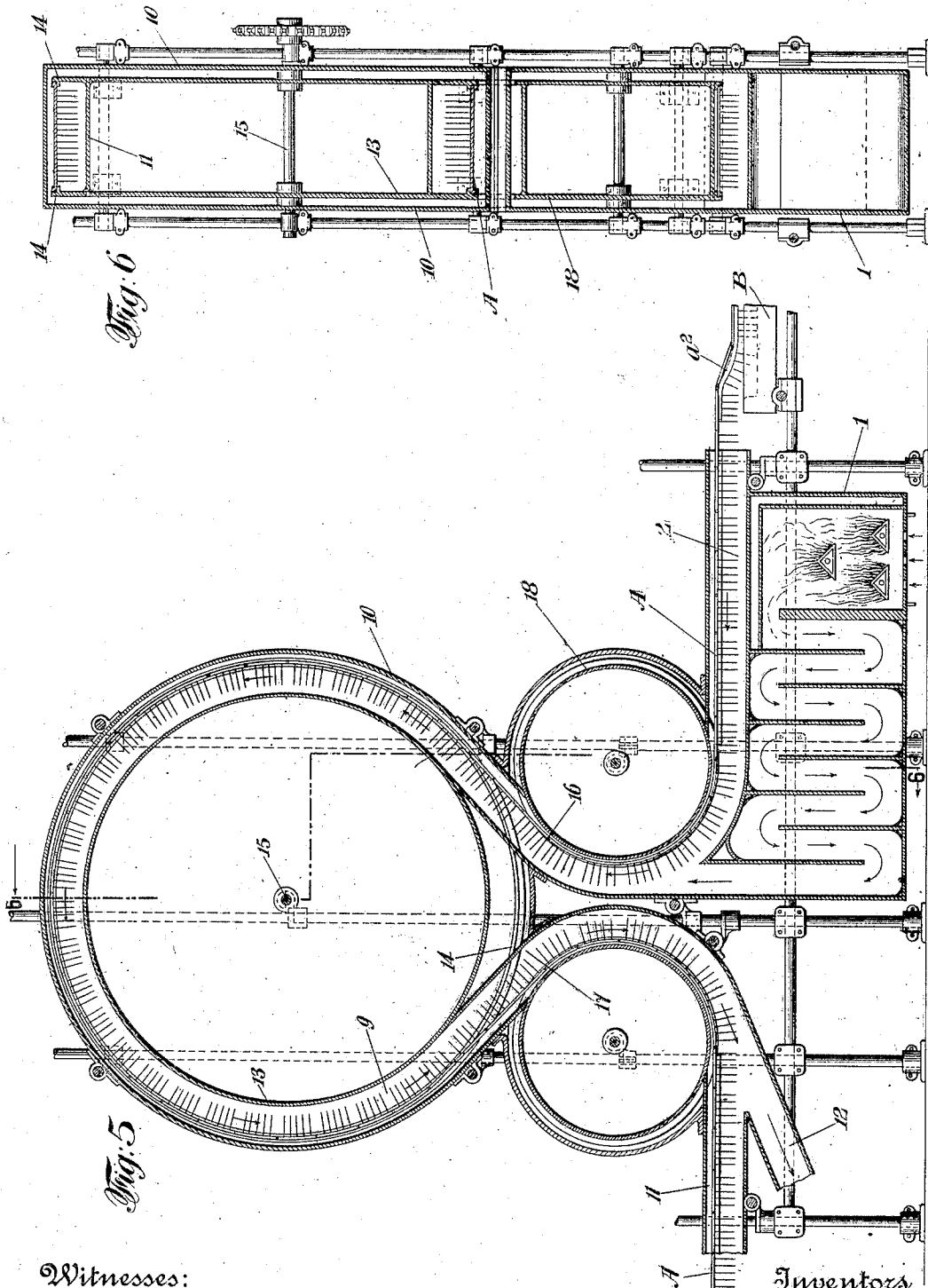
Inventors.
 Frederick V. D. Cruser
 William Green,
 By their Attorney
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Witnesses:
D. B. Bowers
W. H. Riffen

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UNITED STATES PATENT OFFICE.

FREDERICK VAN DYKE CRUSER AND WILLIAM GREEN, OF BARBERTON, OHIO, ASSIGNORS TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SPLINT-DRYING MECHANISM FOR MATCH-MACHINES.

1,044,146.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed June 21, 1912. Serial No. 705,089.

To all whom it may concern:

Be it known that we, FREDERICK VAN DYKE CRUSER and WILLIAM GREEN, citizens of the United States, and residents of Barberton, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Splint-Drying Mechanism for Match-Machines, of which the following is a specification.

10 This invention relates to means for drying match splints, more particularly splints which have been impregnated with a solution of chemicals adapted to render the splints non-glowing after the same, as finished matches, have been ignited and the flame extinguished.

15 The invention especially concerns a drying apparatus for use in connection with that class of continuous match machines wherein is employed an endless carrier chain into which the splints are progressively set in parallel rows and thereby transported through the match-making path; the object of our invention being to provide for such machines a structure whereby the wet splints, during their travel from the impregnating bath, are effectually dried in a relatively short space of time without materially increasing the length of the match machine or retarding the regular speed of travel of the carrier chain; as will be hereinafter described and claimed.

20 In the drawings—Figure 1 is a side elevation, partially in section, of a splint-drying apparatus embodying a good form of our invention, portions of the impregnating tank and splint carrier chain being shown. Fig. 2 is an end elevation of the apparatus. Fig. 3 is a transverse vertical section, as on the line 3—3 of Fig. 1. Fig. 4 is a similar section, as on the line 4—4 of Fig. 1. Fig. 5 is a longitudinal vertical section of a splint-drying apparatus embodying a modified form of our invention. Fig. 6 is a transverse vertical section, as on the line 6—6 of Fig. 5.

25 A designates a portion of an endless carrier chain of any known or approved type into which the splints are inserted in consecutive rows and are thus transported in spaced relation to each other through the match making path.

B designates a tank suitably located be-

neath the carrier, adapted to contain a solution of a suitable chemical or chemicals into which the rows of depending splints on the chain are progressively dipped to a depth and for a period sufficient to accomplish the efficient impregnation of the splints; the chemical or chemicals being of such a nature as to render the splints nonglowing after the splints, as finished matches, have been ignited and extinguished. This tank is supported in any suitable manner, and the track for the chain is appropriately constructed (as at *a'*) to effect the depression of the traveling plates or sections of the chain toward the tank so as to dip the splints in the impregnating solution, then guide the plates or sections above the top of the tank to maintain the splints in the solution, and then raise such plates or sections to withdraw the splints from the solution and permit the progress of the chain with the impregnated splints.

30 C designates the splint drying structure which is so constructed and organized that the traveling chain carrying the impregnated splints is efficiently directed therethrough. This structure, in its preferred form, comprises an elongated heater 1 surmounted by a horizontal chamber 2 through which travels the chain with its impregnated splints depending toward and adjacent to the top plate 3 of the heater, the inner side walls of the chamber being provided with track-ways *a*² for the chain. The heater embodies a rectangular casing having at its forward end a combustion chamber 4 equipped with a burner 5 for oil or gas, and having at its rearward end a vertical flue 6 in communication with the adjacent end of the chamber 2. In the extended space intermediate the combustion chamber and the flue 6 are arranged vertical baffle plates 7, whereby when the oil or gas is ignited at the burner the hot gases and products of combustion, in their passage from the front to the rear of the heater, are directed in a devious course in order to insure the efficient heating of the inflowing air and its prolonged contact with the top plate of the casing, and also to prevent the passage of the flames to the rearward end of the chamber 2. The bottom of the combustion chamber is provided with suitable apertures 8 for the ingress of air.

The rearward end of the chamber, directly above its communication with the flue 6, branches into a substantially circular chamber 9 through which the chain with its splints is directed, whereby not only are the traveling splints directly subjected to the heat radiating from the top plate, but also to the hot gases and products of combustion flowing from the heater.

The chamber 9 is comprised within a shallow casing 10, the contour of which is such that it branches upwardly from the rearward end of the heating chamber 2, curves forwardly and upwardly over the latter, then back and down to a terminal horizontal branch 11, the chamber 9 thus constituting, in effect, a looped continuation of the chamber 2, which interrupts the horizontal path of the chain and insures a prolonged travel of the latter without requiring increased floor space for the match machine. The inner side walls of the chamber, including its inlet and outlet portions, are equipped with flanged wheels 10* which support and guide the chain in its travel.

The chamber 9 is provided at its outlet portion with a branch or extension 12 constituting an air trunk which leads to a suitable exhaust fan (not shown) whereby the exterior air will be drawn into and through the chamber 2 and therein heated and the highly heated air and gases will be drawn into and through the loop chamber in a manner to act with efficient drying effect upon and throughout the mass of splints during their progress through said chambers, the moisture and vapors as rapidly as they are produced being continuously exhausted with the air and gases flowing to the fan.

By the construction and operation above described the wet impregnated splints as they pass through the chamber 2 and enter the loop chamber 9 are subjected to an exceedingly high temperature, so as to promote rapid evaporation of the solvent from the splints, and then as they progress through the latter chamber the partially dried splints are subjected to a decreasing temperature sufficient to accomplish the complete drying of the splints as they approach and emerge from the exit end of the loop chamber. By our invention we are enabled to accomplish the efficient drying of the wet impregnated splints in a very short time,—one minute, more or less,—thus permitting the impregnating and drying operations to be attained in a continuous match machine without materially increasing the length of the machine or retarding the regular speed of the carrier chain during its travel through the match making path.

In the modification of our invention illustrated in Figs. 5 and 6, the chamber 9 is constructed within a casing 10 which is supported above the rearward end of the heater,

such chamber being, in the main, comprised between the inner walls of the casing and a large drum 13 which is concentrically arranged within the casing. This drum is preferably constituted by a wheel which is mounted to rotate within the casing, said wheel having spaced peripheral flanges 14 upon which the lateral edges of the chain are supported so that the splints on the chain will point toward the center of the wheel. The wheel is mounted on a shaft 15 which is journaled in suitably-disposed bearings adjacent the side walls of the casing, which shaft may, if desired, be equipped with any suitable driving connections, such, for example, as the sprocket gearing illustrated. The lower part of the chamber 9 merges with the two converging branch flues 16, 17 one of which leads from the heater flue 2 and the other to the horizontal branch 11. Suitably located guide wheels 18 are arranged in or adjacent the respective branch flues 16, 17; whereby the chain in its travel is directed through the flue 16 to the drum 12, and thence about such drum within the chamber 9; thence to and about the wheel 18 in the flue 17. Thus the horizontal path of the chain is interrupted by an extended upward loop which merges with such path at two adjacent points similarly to the first described construction.

The wheels 18 are ordinary flanged wheels between the flanges of which the back of the chain is guided and supported with the splints extending into the proximate flues. The peripheries of these wheels 18 constitute the outer walls of the branch flues.

It is to be understood that our invention is not limited to the specific form and details of construction herein selected to illustrate the invention.

We claim—

1. In splint drying means for match machines having splint carrier chains, an upwardly-extending loop-like chambered structure having inlet and outlet portions in near relation to each other, means for supporting and guiding the carrier chain within said structure, and means for heating the chamber of said structure.

2. In splint drying means for match machines having splint carrier chains, a substantially circular chambered structure having adjacent inlet and outlet portions, and a heater connected with the inlet portion.

3. In splint drying means for match machines having splint carrier chains, a substantially circular chambered structure having adjacent inlet and outlet portions, and a heater including a combustion chamber and a flue in communication with the said inlet portion.

4. In splint drying means for match machines having splint carrier chains, a substantially circular chambered structure hav-

ing adjacent inlet and outlet portions, a heater connected with the inlet portion, and a chamber directly above and longitudinally of the heater leading to said inlet portion.

5 5. In splint drying means for match machines having carrier chains, a substantially circular chambered structure having adjacent inlet and outlet portions, chain guide wheels within said structure, a heater connected with the inlet portion, and means for

maintaining an air current through said chamber.

Signed at Barberton, in the county of Summit and State of Ohio this fifteenth day of June A. D. 1912.

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Witnesses:

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