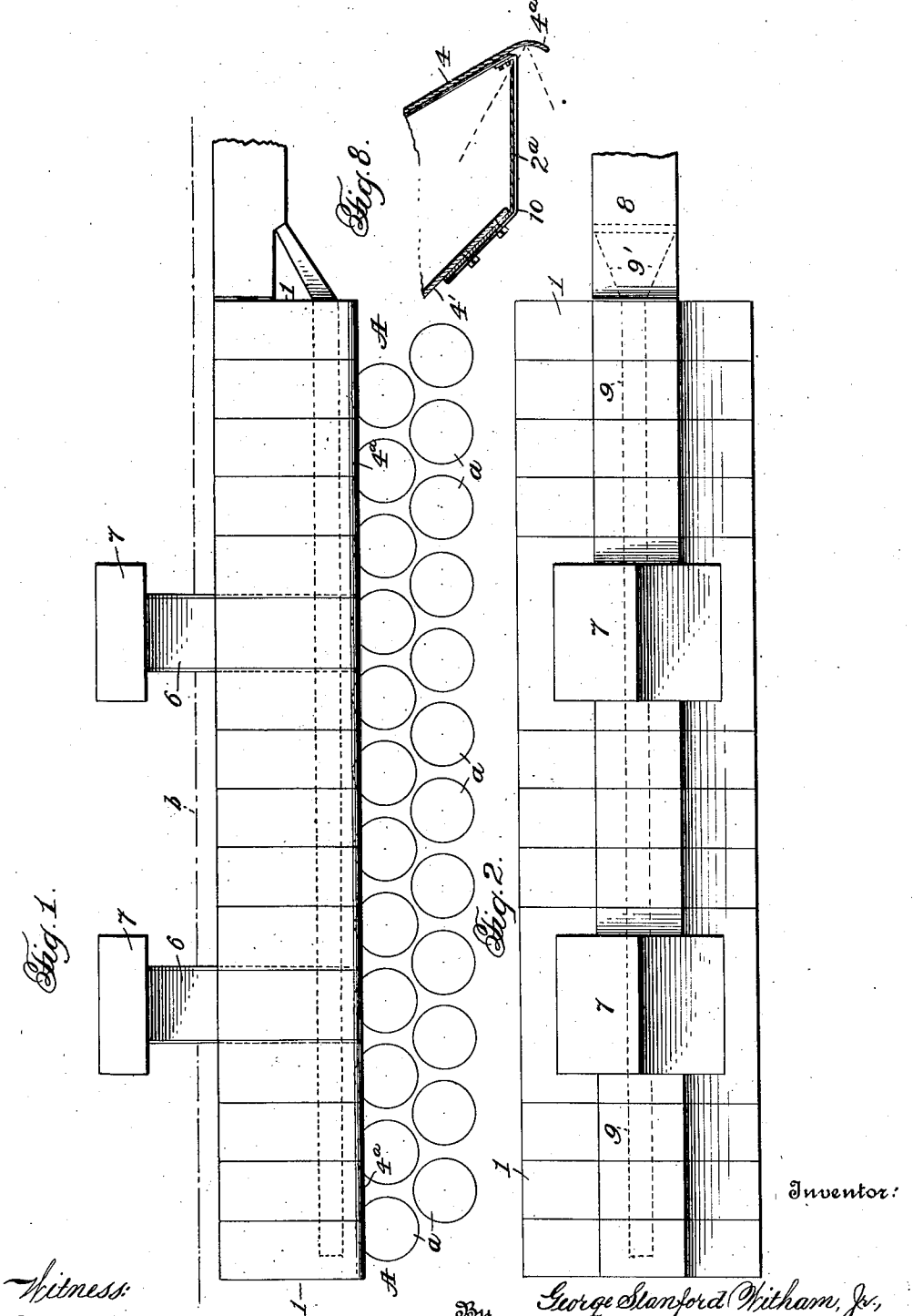
March 23, 1926. 1,577,509

G. S. WITHAM, JR

APPARATUS FOR HANDLING VAPORS

Filed April 10, 1922 2 Sheets-Sheet 1



Witness:
Jas. E. Hutchinson.

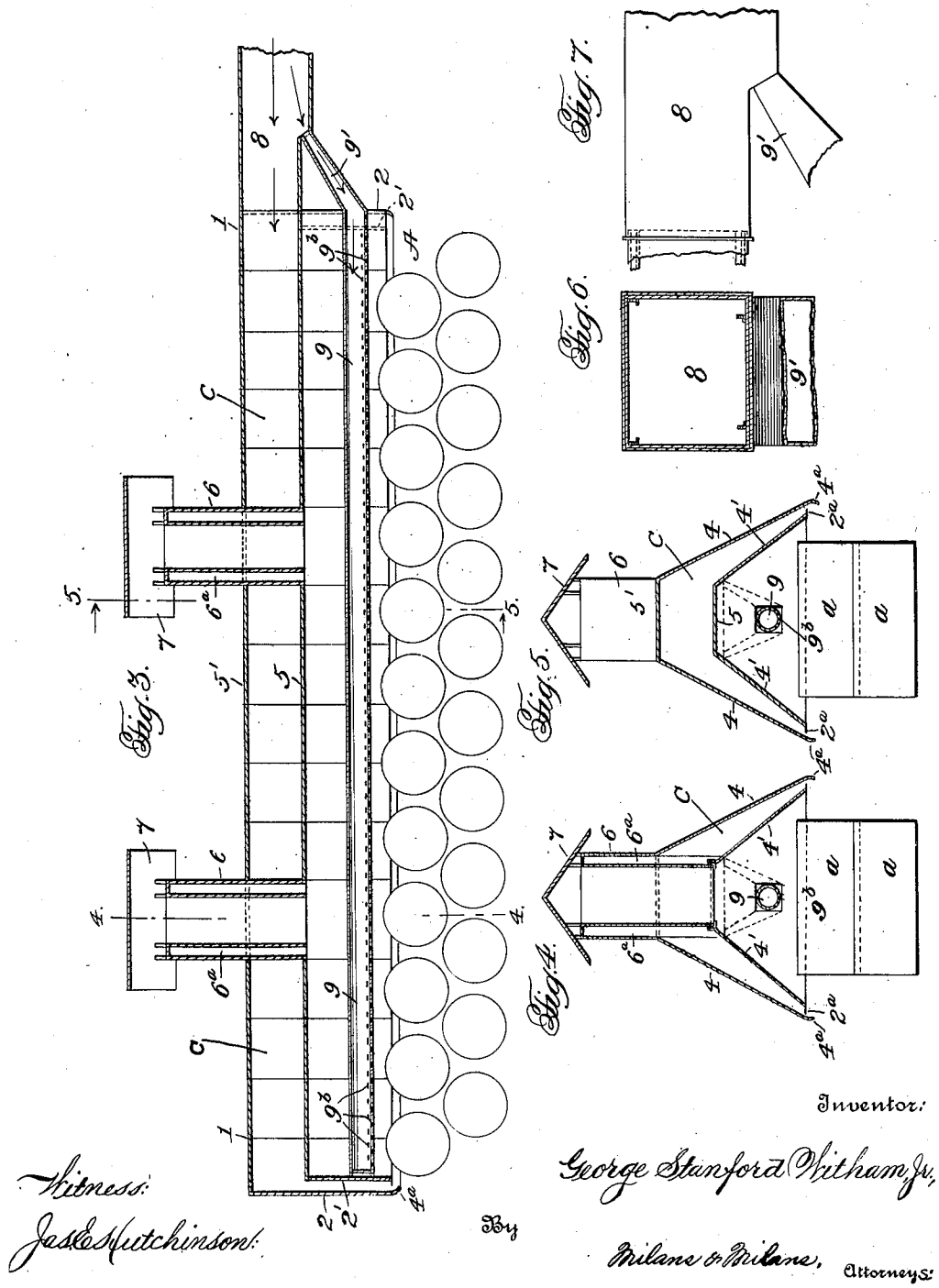
Inventor:
George Stanford Witham, Jr.,
By Milans & Milans, Attorneys.

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Witness:
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Inventor:
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By Milans & Milans, Attorneys.

Patented Mar. 23, 1926. 1,577,509

UNITED STATES PATENT OFFICE.

GEORGE STANFORD WITHAM, JR., OF HUDSON FALLS, NEW YORK, ASSIGNOR TO AMERICAN BLOWER COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

APPARATUS FOR HANDLING VAPORS.

Application filed April 10, 1922. Serial No. 551,416.

To all whom it may concern:

Be it known that I, GEORGE STANFORD WITHAM, Jr., a citizen of the United States, residing at Hudson Falls, in the county of Washington and State of New York, have invented certain new and useful Improvements in Apparatus for Handling Vapors, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improved apparatus for handling vapors given off from various kinds of machines, paper driers, driers of all classes, cooling vats, kettles, cooking ranges, and analogous machines.

The object of the invention is to provide an improved, simple and efficient apparatus whereby the vapors from machines of the character referred to can be treated and advantageously disposed of to further the operation of the main machine or apparatus, and to maintain atmospheric conditions within the work room suitable to operators and prevent the harmful effects to structures and serious losses due to the presence of heavy moisture laden air throughout the drying room.

The invention comprehends passing the vapors directly from the drier or other apparatus through a chambered or double walled hood arranged over the apparatus, and circulating a fluid in the chamber of the hood to maintain the same relatively hot or cold, at a certain temperature relative to the temperature of the vapor in accordance with the requirements, the invention in its broader aspect contemplating the condensation of the vapor in some instances, but having to do more particularly with the treatment of the vapor to prevent condensation thereof, as in the operation of paper drying machines, in which condensation of the vapor over the machine is highly objectionable, such condensation damaging the paper and felts and resulting in serious loss in the manufacture thereof. In the latter case the invention contemplates passing the vapor through a chambered hood arranged over the drier or other machine, and circulating a fluid, in this instance, hot air, in the chamber of the hood to maintain the hood at a higher temperature than the temperature of the vapors rising from the paper drier so that the vapors, subjected to the influence of the heated surfaces of the hood, pass off through the same without condensation. The invention also comprehends the utilization of the heating medium for the hood, hot air, to assist in the circulation of the vapor through the hood, and to dry the material.

The invention, with other objects and advantages thereof, will be understood from the hereinafter contained detailed description, when considered in connection with the accompanying drawings forming part hereof and illustrating one embodiment of the apparatus.

In the drawings:

Figure 1 is a side elevation of an apparatus constructed in accordance with the present invention applied to a paper drying machine.

Fig. 2 is a top plan view.

Fig. 3 is a longitudinal section.

Fig. 4 is a section on the line 4—4 of Figure 3.

Fig. 5 is a section on the line 5—5 of Figure 3.

Figs. 6 and 7 are detailed views of the hot air supply duct.

Fig. 8 is a detailed section, on an enlarged scale, of a lower side portion of the hood.

In the drawings, A designates a conventional form of paper drying machine having the series of rolls over which the paper passes.

In the particular form of vapor handling and treating apparatus illustrated in the drawings, 1 designates the hood arranged over the top of the paper drying machine A, as shown. The hood 1, which is substantially rectangular in shape at its lower end, has double end walls 2—2′, side walls 4—4′ and top walls 5—5′, said walls being spaced, as shown, providing an interior chamber *c* extending throughout the length of the hood and around the ends thereof. The hood is provided with stacks 6 which may lead to any suitable point at which it is desired to deliver the vapors. In this particular instance two stacks are shown extending through the roof of the building, indicated generally by the line *b*, to ventilators 7, said stacks 6 having double walls, the chambers 6^a within the walls of the stacks, connecting

with the interior chamber *c* in the walls of the hood. The side walls 4—4′ of the hood which are inclined as shown, and the end walls 2—2′ are separated at their lower ends. Extending outwardly from the inner side and end walls 4′—2′ is a baffle wall 2^a, and the outer side and end walls 4—2 have portions 4^a extending below the lower ends of the inner walls 2′—4′, and formed to direct the air inwardly of the hood, said portions 2^a being shown curved. The baffle wall 2^a is shown as formed of separate plates secured at their inner ends to the inner walls 2′—4′ by screws or other equivalent means, and 10 are metal strip members secured to the lower ends of the side and end walls, said strip members serving as spacing and reinforcing means for the walls of the hood, and also to support the baffle wall 2^a. The hood may be constructed of any suitable material, in the exemplification shown, the same being formed of metal, galvanized iron, aluminum, or the like and made in sections suitably connected together.

8 designates a hot air duct connected with the hood at one end thereof and leading into the interior chamber *c*, said hot air duct leading from any suitable source of hot air supply and having associated therewith suitable air forcing means, as a blower, (not shown).

Extending centrally and longitudinally within the hood near the lower portion thereof is a hot air supply pipe 9, said pipe having a connection 9′ at one end with the hot air supply duct 8, and being provided at its under side with a plurality of jet orifices 9^b adapted to direct hot air downwardly within the hood in the direction of the rolls *a*.

The hot air is forced into and circulated throughout the interior chamber *c* and the chamber 6^a of the stacks 6, maintaining the hood with its stack portions at the desired temperature. The hot air passes downwardly from the chamber *c* and around the lower end portions of the inner walls 4′ to the interior of the hood, thence upwardly within the same and through the stack portions 6 to the ventilators 7. The vapors rising from the paper drying machine within the hood, are subjected to the influence of the hot surfaces of the hood, and the hot air circulated within the hood, so that condensation of the same is prevented. the vapors passing from the hood through the stacks 6^a and out through the ventilators, the circulation of the air around the lower side walls of the hood inwardly thereof serving to assist in the circulation of the vapors through the hood and also in the drying of the material, the hot air supplied by the hot air pipe 9 also contributing to this result.

While in the drawings a specific embodiment of the invention is illustrated, it will of course be understood that the hood may take various forms to accord with different types of drying, heating, cooking machines or the like, and that other changes and modifications of the particular construction shown, and the carrying out of the invention in other forms, as will appeal to those skilled in the art and falling within the scope of the appended claims may be practiced without departing from the spirit of the invention. The invention in its broader aspect contemplates the circulation of fluid at different temperatures in the interior chamber in the walls of the hood to maintain the same at different temperatures relative to the vapors to produce different results. In performing certain operations with other kinds of apparatus, in which it is desirable to condense the vapors arising therefrom, this, as will be understood, may be readily accomplished by circulating cold air through the interior chamber of the hood, which may also be modified to accord with this character of treatment.

What I claim is:

1. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, and means for circulating a heating fluid in contact with the walls of the hood and inwardly around the bottom thereof to the interior of the same to maintain the hood at a certain temperature relative to the temperature of the vapors and to assist the circulation of the vapors through the hood.

2. The combination with a paper drying machine, of apparatus for preventing condensation of the vapors over the machine, said apparatus including a hood, means for circulating a heating fluid in contact with the walls of the hood to maintain the hood at the required temperature relative to the temperature of the vapors, a pipe within the hood near the lower part thereof, said pipe having discharge orifices, and means for supplying heated air to said pipe.

3. The combination with a paper drying machine, of apparatus for preventing condensation of the vapors over the machine, said apparatus including a hood, means for circulating heated air in contact with the walls of the hood, and an air supply pipe within the hood near the lower part thereof, said pipe having discharge orifices in the under side thereof, and means for supplying heated air to said pipe.

4. The combination with an apparatus from which condensable vapors are given off, of a hood associated therewith to receive the vapors directly therefrom, a stack leading off from said hood, the hood having double walls with an interior chamber therebetween, and said hood having a discharge outlet opening from said interior chamber

adjoining the interior of the hood, and means for supplying heated air to said interior chamber of the hood to heat the walls of the hood and to assist the circulation of the vapors through the hood.

5. The combination with a drying machine, of a hood associated directly therewith to receive the vapors directly therefrom, a stack leading off from the hood, said hood having double walls with a chamber therebetween, the hood at its lower end having an opening extending completely around the same from said chamber, and means for supplying heated air to the hood to heat the walls thereof and to assist the circulation of the vapors through the hood.

6. The combination with an apparatus from which condensable vapors are given off, of a hood arranged over the apparatus, a stack connected with the hood, said hood having double side and end walls with an interior chamber therebetween, the hood having a discharge outlet completely about its lower end from said interior chamber, means at the lower end of the hood for deflecting the air from said discharge outlet inwardly of the hood, and means for supplying heated air to said interior chamber to heat the hood and to assist the circulation of the vapors through the hood.

7. The combination with a paper drying machine, of a hood arranged over the machine, a stack connected with the hood, the hood having double walls with a chamber therebetween, a hot air supply duct connected with said chamber a pipe arranged within the hood to supply hot air thereto, and a supply connection between said pipe and said hot air duct.

8. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, means for maintaining the hood at a certain temperature relative to the temperature of the vapors, and means for supplying heated air to the interior of the hood.

9. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, means for maintaining the hood at a certain temperature relative to the temperature of the vapors, and means for supplying heated air to the interior of the hood at the lower part thereof.

10. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, means for maintaining the hood at a certain temperature relative to the temperature of the vapors, and means providing for the circulation of heated air inwardly into the hood from the sides thereof.

11. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, means for maintaining the hood at a certain temperature relative to the temperature of the vapors, and means providing for a circulation of heated air inwardly from the lower marginal portions of the wall of the hood to the interior of the same.

12. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, means for maintaining the hood at a certain temperature relative to the temperature of the vapors, means providing for a circulation of heated air inwardly from the lower marginal portions of the hood to the interior of the same, and means for supplying heated air to the interior of the hood at the lower part thereof intermediate its side walls.

13. The combination with an apparatus from which condensable vapors are given off, of a hood associated therewith to receive the vapors directly therefrom, a stack leading off from the hood, said hood having double walls with an interior chamber therebetween, and said hood having a discharge outlet extending along a lower marginal portion thereof from said interior chamber adjoining the interior of the hood, and means for supplying heated air to the interior chamber of the hood to heat the walls thereof and to assist the circulation of the vapors through the hood.

14. The combination with an apparatus from which condensable vapors are given off, of a hood associated therewith to receive the vapors directly therefrom, a stack leading off from the hood, the hood having double walls with an interior chamber therebetween, and said hood having a discharge outlet along a lower marginal portion thereof, means for supplying heated air to the interior chamber of the hood to heat the walls thereof and to assist the circulation of the vapors through the hood, and means associated with said discharge outlet for deflecting the air inwardly of the hood from said outlet.

15. The combination with an apparatus from which condensable vapors are given off, of a hood associated therewith to receive the vapors directly therefrom, a stack leading off from the hood, said hood having double walls with an interior chamber therebetween, and said hood having a discharge outlet along a lower marginal portion thereof, and the outer wall portion of the hood adjoining said discharge outlet having a downwardly and inwardly extending extension portion to deflect air passing from said discharge outlet to the interior of the hood, and means for supplying heated air

to said interior chamber of the hood to heat the walls of the hood and to assist the circulation of the vapors through the hood.

16. The combination with an apparatus from which condensable vapors are given off, of a hood associated with said apparatus to receive the vapors directly therefrom, a stack leading off from the hood, said hood having double walls with an interior chamber therebetween, the double walls of the sides of the hood converging toward the lower end of the hood, and said side walls each having a discharge outlet along a lower marginal portion thereof from the interior chamber adjoining the interior of the hood, and means for supplying heated air to the said interior chamber of the hood to heat the walls of the hood and to assist the circulation of the vapors through the hood.

In testimony whereof I hereunto affix my signature.

GEORGE STANFORD WITHAM, JR.