

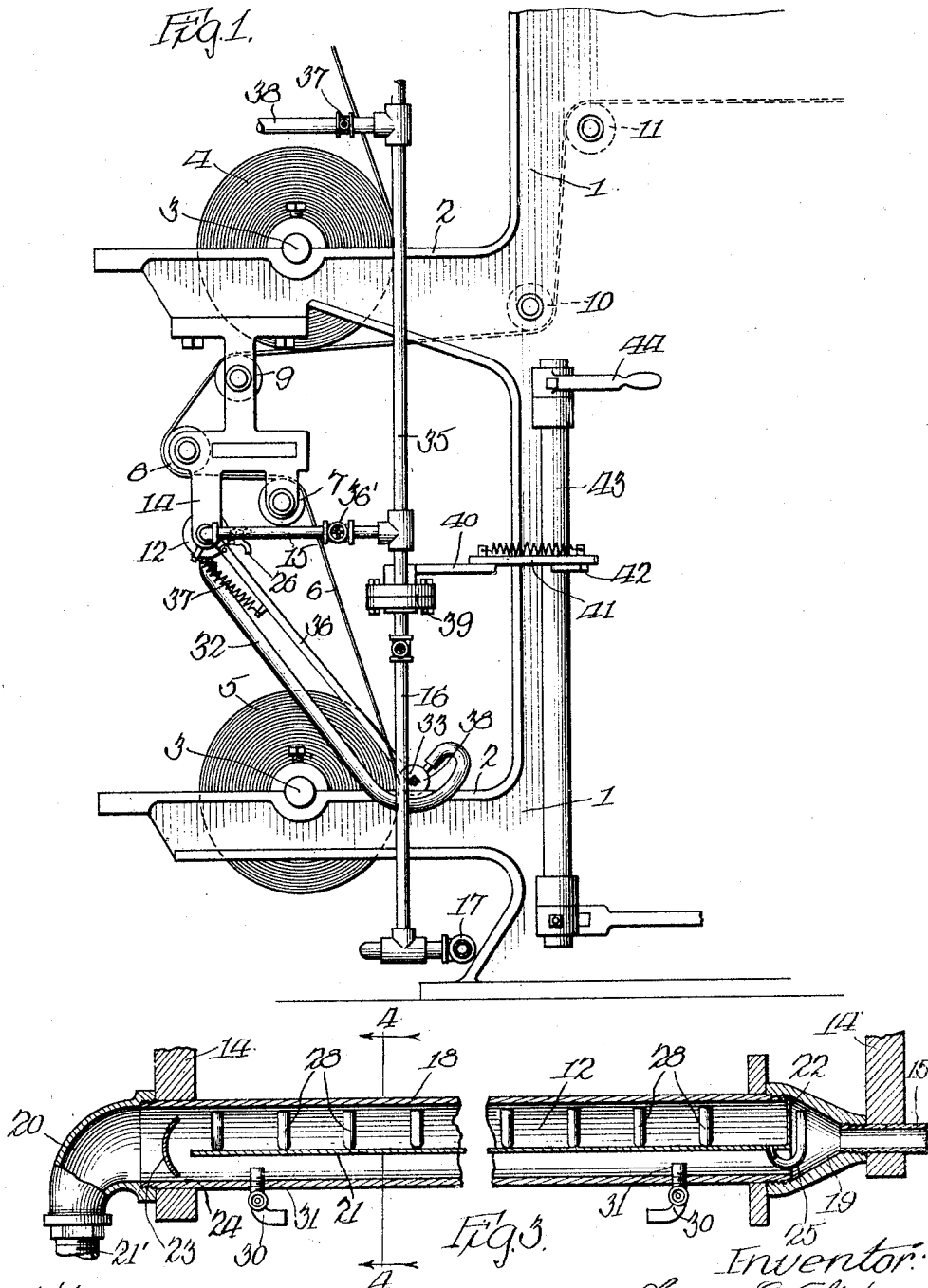
HUMIDIFIER FOR PRINTING MACHINES OR THE LIKE.

APPLICATION FILED OCT. 18, 1917.

**1,374,726.**

Patented Apr. 12, 1921.

2 SHEETS—SHEET 1.



Witness:  
Leif Du Mar.

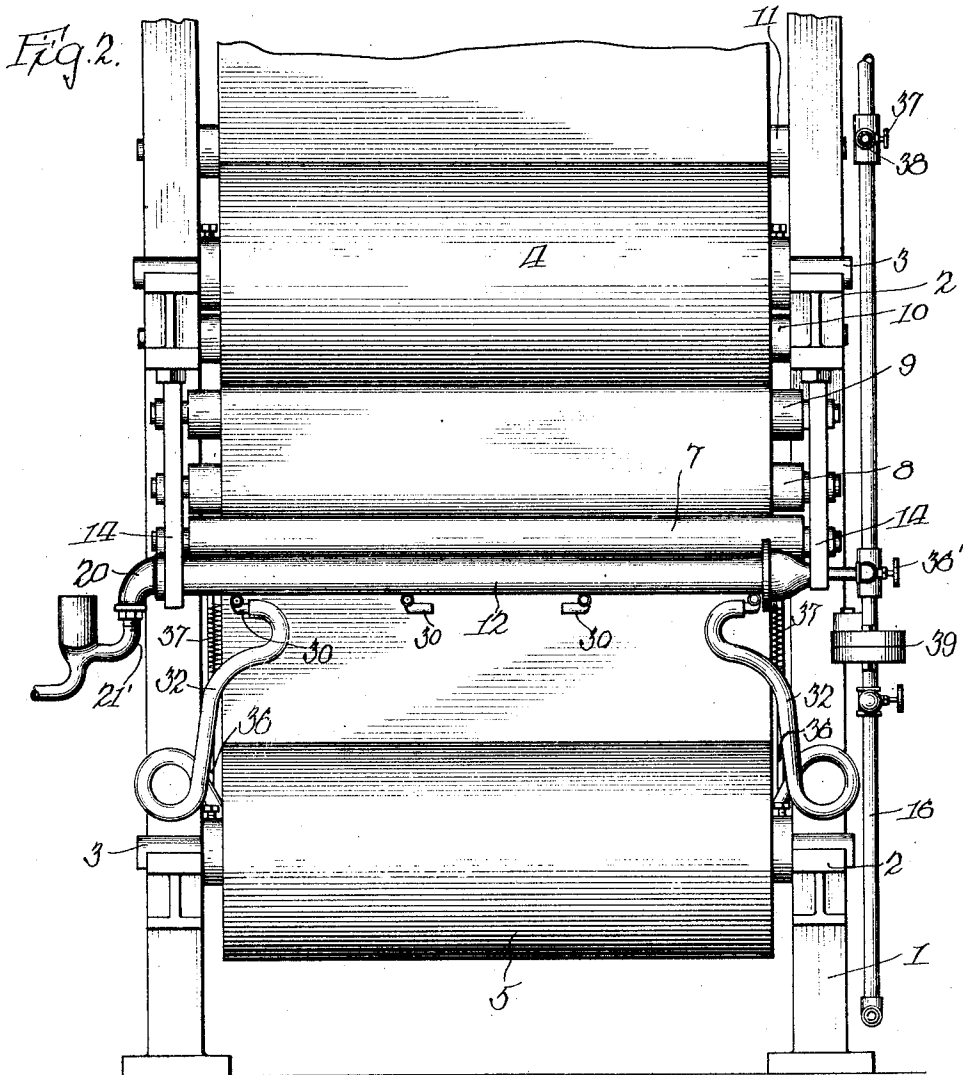
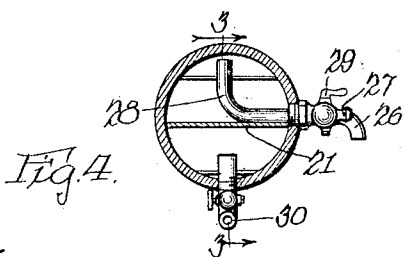
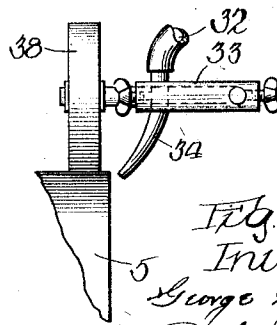
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George E. Flint  
By Burton A. Hills  
Att'y.

G. C. FLINT.  
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2 SHEETS—SHEET 2.



Witness:  
 Leo. DuMau.

Inventor:  
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# UNITED STATES PATENT OFFICE.

GEORGE C. FLINT, OF CHICAGO, ILLINOIS.

HUMIDIFIER FOR PRINTING-MACHINES OR THE LIKE.

1,374,726.

Specification of Letters Patent.

Patented Apr. 12, 1921.

Application filed October 18, 1917. Serial No. 197,374.

*To all whom it may concern:*

Be it known that I, GEORGE C. FLINT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Humidifiers for Printing-Machines or the like.

My invention relates to means for use in connection with printing machines for supplying a predetermined amount of moisture to the various portions of the material being printed upon during the printing operation.

The object of my invention is to provide a simple, reliable, convenient and efficient device of the kind described wherein the preparation of the material proceeds simultaneously with the printing operation.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the accompanying drawings wherein like or similar reference characters indicate like or corresponding parts:

Figure 1 is a fragmentary side elevation of a printing machine equipped with my improvement.

Fig. 2 is an end elevation of the same.

Fig. 3 is a longitudinal section of the vapor distributing casing of my device taken substantially on line 3—3 of Fig. 4.

Fig. 4 is a section taken substantially on line 4—4 of Fig. 3.

Fig. 5 is a fragmentary detail of the carrier and associated parts for directing vapor to the end of the roll.

In the drawings my improvement is shown applied to what is known as a web printing press or one in which paper or other material to be printed upon is provided in rolls which gradually unwind during the printing operation.

As shown 1—1 is a portion of the frame work of the printing machine having brackets 2—2 for supporting the shafts 3—3 upon which the paper rolls 4 and 5 are mounted. In the drawings I have only shown the mechanism desirable for treating the paper from the roll 5 although it is obvious that similar mechanism should be provided for each web of paper entering the machine, but the mechanism for each roll is substantially the same.

In the form shown the web of paper 6 from the roll 5 is led upward from the roll 5 over rollers 7, 8, 9, 10 and 11 as it enters the machine, the mechanism being substantially of the usual or any desired arrangement for this type of devices. My improved dampening mechanism comprises a casing 12 rigidly mounted upon the parts 14 of the frame-work of the machine and connected by pipes 15 and 16 to a steam system 17 where steam, preferably under comparatively low pressure, say from two to five pounds is provided, the casing 12 may be of any desired form or construction adapted to extend across the printing machine adjacent the paper 6 as it enters the machine. As shown the casing 12 comprises a tubular body-part 18 provided with an inlet 19 at one end and an outlet 20 at the opposite end, to which if desired, a waste pipe 21 may be connected to conduct the surplus steam and any water collecting in the casing to a suitable trap or drain.

A substantially horizontal partition 21 is provided in the body part 18 snugly fitting the sides of the casing and having a part 22 extending upward to the wall of the casing above the inlet 19 so that steam entering the casing at the inlet will be deflected to the bottom of the casing and prevented from entering directly into the spaces above the partition 21. A transverse baffle 23 is also provided in the casing at the outlet end thereof beyond the partition 21 so that as the steam flows along the lower side of the casing the lighter drier part will be deflected upward by the baffle 23 into the space above the partition while the water of condensation and the more completely saturated steam or vapor in the casing will escape through the opening 24 between the baffle and the bottom wall of the casing. A vent pipe 25 is also preferably provided at the inlet end of the casing rigidly secured to the partition 21 and extending downward therefrom, thence bent in a U form with the free end near the top of the casing to insure a substantially uniform distribution of the vapor in the space above the partition. It will thus be seen that only the comparatively slightly moist vapor will be collected in the space above the partition 21 while the water of condensation and the saturated vapor will fill the space below the partition.

Any suitable means may be provided for discharging the slightly moist vapor above the partition against the face of the paper or other material 6. As shown a plurality of  
 5 nozzles 26 and 27 are provided in the side of the casing 12 each connected to the space above the partition 21 and each preferably having a tubular extension 28 within the casing extending into close proximity to  
 10 the upper wall of the casing so that only the vapor near the upper wall of the casing containing the very least amount of moisture will be discharged from the nozzles which are preferably arranged to direct the vapor  
 15 against a considerable surface of the paper 6. For this purpose the nozzles 26 are each provided with a curved portion at their outer end for directing vapor at an angle downward while the nozzles 27 discharge in  
 20 substantially a horizontal direction.

In the preferred construction each nozzle is provided with a suitable closure having a handle 29 or other convenient means for controlling the escape of vapor therefrom.  
 25 In the preferred construction also a plurality of outlet openings 30 are provided upon the casing 12 each attached to the lower wall thereof and each preferably having a part 31 extending into the space below the partition 21 so that water flowing  
 30 along the bottom of the casing will not enter the outlet openings while the saturated vapor in the casing immediately above the water will be discharged therethrough.  
 35 As shown a flexible pipe 32 is connected to an outlet 30 near each end of the casing 12 and the free end of each pipe is mounted upon a carrier 33 and provided with a flattened tip 34 arranged to direct the saturated  
 40 vapor from the outlet 30 to the ends of the roll 5 near its periphery. In the form shown an arm 36 is pivotally attached to the frame-work 14 with the carrier 33 near its free end and spring 37 or other convenient  
 45 means extends from a suitable point on the arm to a portion of the frame 14 to normally force the carrier toward the center of the roll 5. A wheel 38 or other suitable means is provided on the carrier adapted to  
 50 engage the periphery of the roll to control the position of the carrier and rests upon the outer layer of paper in the roll thereby constantly maintaining the tip 34 in position to discharge the saturated vapor upon the  
 55 outer layers of the paper forming the roll. When thus connected it is obvious that saturated vapor will be continuously discharged against the edges of the paper in the roll 5 while a slightly moist vapor is directed  
 60 against the entire surface of the paper after it leaves the roll, it thus follows that the edges of the paper receive slightly more moisture than the remainder of the web and is therefore slightly more expanded thus re-  
 65 lieving the tension at the edges of the web

and preventing any tendency to tear the web as it passes over the various rolls and through the remaining mechanism of the printing machine.

It is important however to direct the 70 vapor to the paper only as it is moving through the machine and in that the volume of vapor should correspond, at least to a certain extent, with the speed at which the paper is moving. Any suitable means may 75 be provided for this purpose. As shown the pipe 16 serves as a main, the pipe 35 extends upward beyond the pipe 15 to supply the roll 4 and any other rolls which may be required to supply the printing machine. 80 Suitable valves 36' and 37 are provided in the pipes 15 and 38 respectively so that if desired steam may be partially or entirely shut off from my humidifier for any desired roll while the supply to the humidifiers for 85 the remaining rolls in the machine will not be interfered with. In the preferred construction suitable means are provided for automatically controlling the supply of steam to the humidifiers so that when the 90 printing machine is started the humidifiers will also be put in operation and will be stopped when the printing machine is stopped. Any suitable means may be provided for this purpose. As shown a valve 95 39 is provided in the pipe 16 adapted to control the flow of steam to the humidifiers for all the rolls and suitable means are provided for opening and closing the valve 39 when the printing machine is started and 100 stopped respectively. Where a printing machine is controlled by electricity an electrically controlled valve may be employed for this purpose. In the form shown however the valve 39 is provided with an oper- 105 ating handle 40 and the free end of the handle 40 is connected by a link 41 to a projecting arm 42 upon the shaft 43 to which the main controlling lever 44 of the printing machine is attached. The several parts 110 are so constructed and arranged that when the lever 44 is moved to stop the printing machine the valve 39 will be closed preventing the escape of steam from the pipe 16 and when the lever 44 is moved to start the 115 printing machine the valve 39 is opened. The valve 39 may if desired be so constructed and arranged that when the lever 44 is positioned to operate the printing machine slowly a comparatively small amount of 120 steam is permitted to escape from the pipe 16 to the several humidifiers and as the lever 44 is moved to gradually increase the speed of the printing machine the valve 39 is operated to permit a corresponding increase 125 in the amount of steam to escape from the pipe 16 to the humidifiers.

When thus arranged it is obvious that as soon as the printing machine begins to operate the paper upon which it operates will 130

be suitably treated by my device and that no adjustment is required as the speed of the printing machine is from time to time changed since the amount of steam admitted to the humidifiers is at all times controlled by the position of the lever 44 which controls the operation of the printing machine.

In practice my humidifier entirely eliminates paper dust and other foreign material which frequently adheres to the surfaces and edges of the paper, clogging the type and seriously interfering with the efficient operation of the machine. It also entirely eliminates the difficulties incident to the generation of static electricity in the press as well as obtaining a sharper and clearer impression owing to the slight dampness of the paper, as well as practically eliminating the waste of paper caused by the breaking of the web as the paper passes through the machine. While in the preceding description I have referred to paper as the material upon which the press is operated, and no doubt the greatest advantages are secured upon printing presses employed in printing upon paper, it is obvious that my improvement may be employed upon machines printing upon any substance, hence where the term paper is employed I desire to be understood as referring to any material which it is desired to print upon. It is also obvious that various modifications may be made from the form of my device specifically set forth in the preceding description without departing from the spirit of my invention, hence I do not wish to be understood as limiting myself to the exact form or construction shown.

What I claim as new and desire to secure by Letters Patent is:

1. A humidifier for printing machines and the like wherein the material to be operated upon is provided in a rotatably mounted roll, comprising a tubular casing and means for connecting said casing in a steam system, in combination with a carrier, means adapted to engage said roll to control the position of said carrier in relation to said roll, and means connected to said casing and said carrier for directing fluid from said casing to the edges of said material.

2. A humidifier for printing machines and the like wherein the material to be operated upon is provided in a rotatably mounted roll, comprising a tubular casing and means for connecting said casing in a steam system, in combination with a carrier pivotally attached to the frame of said machine and adapted to engage said roll to control the position of said carrier in relation to said roll, and means connected to said casing and said carrier for directing fluid from said casing to the edges of said material.

3. A humidifier for printing machines and the like wherein material to be operated

upon is provided in a rotatably mounted roll, comprising a tubular casing, and means for connecting said casing in a steam system, in combination with a carrier, a wheel rotatably mounted upon said carrier adapted to engage said roll to control the position of said carrier in relation to said roll, and means connected to said casing and said carrier for directing fluid from said casing to the edges of said material.

4. A humidifier for printing machines and the like wherein the material to be operated upon is provided in a rotatably mounted roll, comprising a tubular casing and means for connecting said casing in a steam system, in combination with a carrier pivotally attached to the frame of said machine, a wheel rotatably mounted upon said carrier and adapted to engage the face of said roll to control the position of said carrier in relation to said roll and means connected to said casing and said carrier for directing fluid from said casing to the edge of said material.

5. A humidifier for printing machines and the like wherein the material to be operated upon is provided in a rotatably mounted roll, comprising a tubular casing, and means for connecting said casing in a steam system, in combination with a carrier, a wheel rotatably mounted upon said carrier and adapted to engage the face of said roll to control the position of said carrier in relation to said roll, and means connected to said casing and said carrier for directing fluid from said casing to the edges of said material.

6. A humidifier comprising an elongated tubular casing having an inlet, and means for connecting said inlet to a steam system, in combination with a plurality of nozzles extending from said casing each arranged to discharge vapor from the upper part of the chamber in said casing and a plurality of independent tubular outlets upon said casing each arranged to discharge a saturated vapor from another part of the chamber in said casing.

7. A humidifier comprising a casing having an inlet, a horizontal partition extending across said casing with a part adjacent said inlet extending to the wall of the casing above said inlet, and means for connecting said inlet to a steam system, in combination with a plurality of nozzles attached to said casing above said partition, each arranged to discharge a slightly moist vapor from above said partition and a plurality of tubular outlets upon said casing below said partition each arranged to discharge a vapor from below said partition.

8. A humidifier comprising a casing having an inlet, and means for connecting said inlet to a steam system, in combination with a plurality of nozzles attached to said cas-

ing each having a tubular part extending into close proximity to the upper wall of said casing arranged to discharge vapor from adjacent the upper wall of said casing and a plurality of tubular outlets upon said casing each arranged to discharge a vapor from a lower point in said casing.

9. A humidifier comprising a casing, a substantially horizontal partition extending across said casing said casing having an inlet connected to the space below said partition and means for connecting said inlet to a steam system, in combination with a plurality of nozzles attached to said casing above said partition each arranged to discharge a vapor from said casing and a plurality of tubular outlets upon said casing each connected to the space below said partition and arranged to discharge a vapor from said casing.

10. A humidifier comprising a casing having an inlet, a horizontal partition extending across said casing with a part adjacent said inlet extending to the wall of the casing above said inlet, means for connecting said inlet to a steam system, in combination with a plurality of nozzles attached to said casing each having a tubular part extending into close proximity to the upper wall of said casing and arranged to discharge a vapor from said casing and a plurality of tubular outlets upon said casing each arranged to discharge a vapor from said casing at a point below the other nozzles.

11. A humidifier comprising an elongated tubular casing having an inlet at one end, a longitudinal partition extending across said casing and means for connecting said inlet to a steam system, in combination with a plurality of nozzles attached to said casing each having a tubular part extending into the space above said partition and into close proximity to the upper wall of said casing arranged to discharge a vapor from said casing and a plurality of tubular outlets upon said casing each arranged to discharge a vapor from a lower point in said casing.

12. A humidifier for printing machines and the like comprising a tubular casing extending transversely of the machine and means for connecting said casing in a steam system, in combination with a horizontal partition extending across said casing with means arranged to exclude the steam as it enters the casing from the space above said partition for separating the slightly moist from the saturated vapor in the casing, a plurality of nozzles attached to said casing each arranged to direct the vapor from the casing against the surface of the material passing through said machine and a plurality of other outlets upon said casing arranged to discharge the vapor from the casing from a different level therein and

means for directing said vapor from the last mentioned nozzles to the edges of said material.

13. A humidifier for printing machines and the like comprising a tubular casing extending transversely of the machine and means for connecting said casing in a steam system, in combination with means for separating the casing into different chambers, a plurality of nozzles attached to said casing each arranged to direct the vapor from one of said chambers in the casing against the surface of the material passing through said machine and a plurality of outlets upon said casing arranged to discharge vapor from the other of said chambers in the casing and means for directing said vapor from said last mentioned outlets to the edges of said material.

14. A humidifier for printing machines and the like comprising a tubular casing extending transversely of the machine and means for connecting said casing in a steam system, in combination with means for separating the vapor in the casing into two chambers, a plurality of nozzles attached to said casing each arranged to direct the vapor from one chamber in the casing against the surface of the material passing through said machine and a plurality of outlets upon said casing each arranged to discharge vapor from the other chamber in the casing and a flexible conduit attached to said last mentioned outlets and coöperating with a movable supporting carrier engaging said material for directing said vapor to the edges of said material.

15. A humidifier for printing machines and the like comprising a tubular casing extending transversely of the machine and means for connecting said casing in a steam system, in combination with means for separating the vapor in the casing into different chambers arranged one above the other, a plurality of nozzles attached to said casing each arranged to direct the vapor from adjacent the upper wall of the casing against the surface of the material passing through said machine and a plurality of outlets upon said casing each arranged to receive the vapor from near the bottom wall of the casing to discharge vapor from the casing and means coöperating with a movable carrier engaging said material for directing said vapor discharged from the bottom wall to the edges of said material.

16. An attachment for printing presses, including a steam line, a transverse pipe connected to said line and provided with means for discharging steam against a sheet of paper being unwound from a roll, and a movable nozzle arranged at the end

of the roll to project steam against said end and alining at all times with the outer ply of the roll.

17. An attachment for printing presses, including a steam line, a transverse pipe connected to said line and provided with means for discharging steam against a sheet of paper being unwound from a roll, a movable nozzle arranged at the end of the roll to project steam against said end, and means connected with said nozzle and

adapted to engage said roll to control the position of said nozzle to aline it at all times with the outer ply of the roll.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE C. FLINT.

Witnesses:

BLANCHE CHALMERS,  
BURTON U. HILLS.