

T. ALLSOP & W. W. SIBSON.
 FABRIC TREATING APPARATUS.
 APPLICATION FILED OCT. 5, 1914.

1,200,433.

Patented Oct. 3, 1916.
 3 SHEETS—SHEET 1.

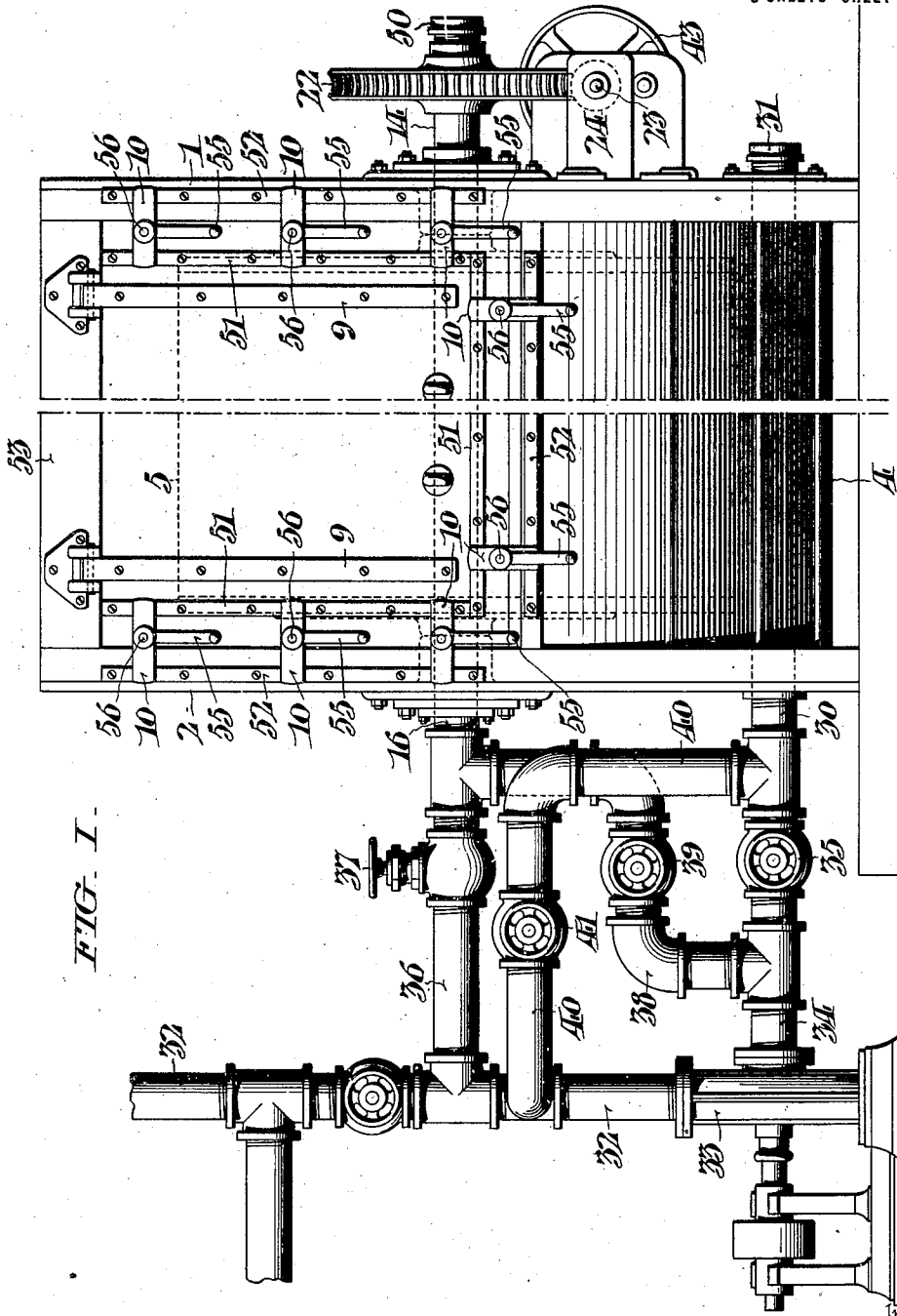


FIG. I.

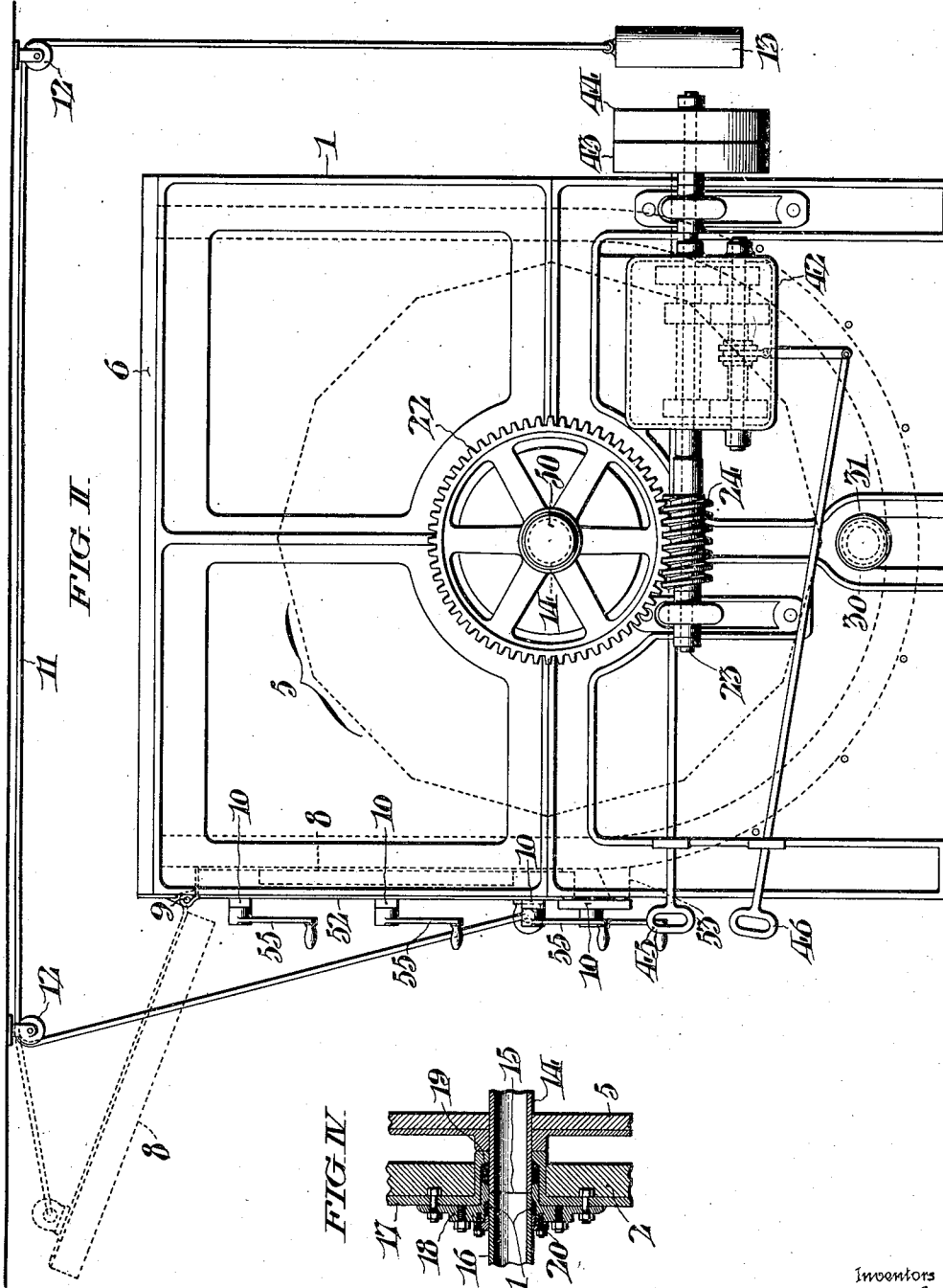
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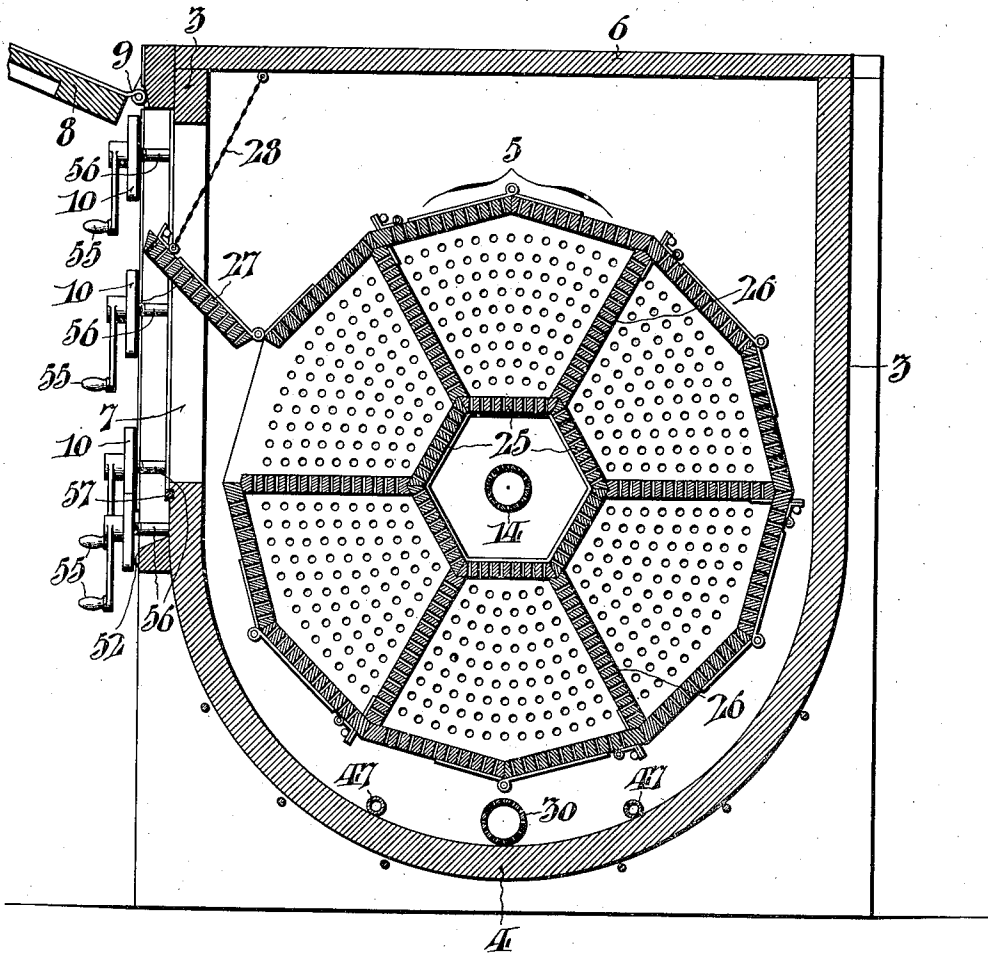
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FIG. III.



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UNITED STATES PATENT OFFICE.

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FABRIC-TREATING APPARATUS.

1,200,433.

Specification of Letters Patent.

Patented Oct. 3, 1916.

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To all whom it may concern:

Be it known that we, THOMAS ALLSOP and WALTER W. SIBSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Fabric-Treating Apparatus, whereof the following is a specification, reference being had to the accompanying drawings.

The invention relates more particularly to an apparatus wherein fabrics may be dyed, washed, bleached or otherwise treated.

One object of the invention is to provide an apparatus of the above character which shall be substantially free from metal parts and wherein the fabric to be treated may be moved about in the treating liquor contained in the apparatus.

A further object of the invention is to provide an apparatus of the above character wherein the fabric being treated may be entirely submerged in the treating liquor and wherein ready access may be had to the fabric for removing the same.

A still further object of the invention is to provide an apparatus of the above character which shall be simple in construction and of few parts and wherein means is provided for circulating the treating liquor through the tank of the apparatus and wherein the treating liquor may be withdrawn from the tank, either in whole or in part, and again returned to the tank if desired.

A still further object of the invention is to provide an apparatus of the above character wherein a rotating drum is adapted to receive the fabric to be treated and wherein said drum may be made accessible to the operator through an opening in the side wall of the tank, which opening is closed by a panel or door forming a liquid tight joint with the side wall of the tank, so that the tank may be filled with a treating liquid to a point near the top of the said opening for submerging the entire drum.

These and other objects will in part be obvious and will in part be hereinafter more fully described.

In the drawings, Figure I, is a front view of a fabric treating apparatus embodying our invention. Fig. II, is an end view of the same. Fig. III, is a transverse sectional view through the apparatus. Fig. IV,

is a detail showing the supporting bearing for the drum and the packing box for the pipe through which the treating liquor is supplied.

The invention consists generally in providing an apparatus which comprises a treating tank in which is mounted a rotating drum for the articles or material to be treated. This tank is mounted in a fixed supporting frame and is provided with a closure for the top thereof. An opening is formed in one of the side walls of the tank and is adapted to be closed by a panel or door making a liquid tight joint with the walls of the tank so that the tank may be filled to a point near the top of the opening. The drum is mounted, preferably, on a perforated pipe, which pipe is journaled in suitable bearings on the end walls of the tank. The drum is attached to the pipe so that when the pipe is rotated the drum will rotate therewith; this drum and the tank likewise are preferably made of wood. The drum is divided into compartments and the walls of each compartment are perforated to permit the liquor to freely flow through the compartments. A stationary pipe is arranged in alinement with the movable supporting pipe for the drum through which the treating liquor may be forced or drawn from the tank. A second perforated pipe is connected to the tank adjacent its bottom and these pipes on the exterior of the tank, from a part of the circulation and storage system for the liquor.

Referring more in detail to the drawings, the fabric treating apparatus consists of suitable end frames 1, and 2, to which are attached the side walls 3, 3, of a tank. The bottom 4, of the tank is curved so as to conform in a general way to the cylindrical drum 5, which is adapted to be rotatably mounted in the tank. The tank is closed at the top by a cover 6, which prevents sun light from entering and affecting the goods and also retains the steam and heat in the apparatus provided the goods require treatment by boiling the treating liquor. In one of the side walls of the tank there is an opening 7, which is adapted to be closed by a panel or door 8. In the present embodiment of the invention the panel is shown as supported by suitable hinges 9, at the upper edge thereof. These

hinges are so constructed as to form a loose hinged connection and thereby permit the cover to be forced into liquid tight contact with the side wall of the tank. In Fig. I, of the drawings, we have shown the hinges 9, as strap hinges and the cover held closed by suitable locking devices. As best seen in Fig. I, these locking devices consist of plates 10, which span or bridge strips 51, and 52, the former of which are mounted adjacent the side edges and the lower edge of the panel or door, while the latter are correspondingly mounted on the door frame 53, adjacent the edges of the opening 7. Plates 10, are clamped into position by means of handles 55, having threaded engagement with bolts 56, secured to and extending outward from the side frame of the machine. In this manner the panel or door may be tightly clamped in closed position, and a resilient gasket 57, recessed into the side wall of the machine (Fig. III), serves to make a liquid tight joint about the sides and bottom of the door. A few turns of the handles 55, will suffice to release or tighten the plates 10, so that the panel or door 8, may be quickly opened or closed. In the drawings, we have illustrated these locking devices as distributed only about the three edges of the door, namely, the bottom and the two sides. It will, however, be readily understood that the upper edge of the panel or door may also be provided with these clamping devices in cases where the opening in the side of the tank is wholly below the level of the liquid in the tank. In the present instance, wherein the liquid level is slightly below the upper edge of the door, we have found it unnecessary to make this edge water tight.

In Fig. II of the drawings, we have shown a cord 11, attached to the panel adjacent the lower end thereof and running over suitable pulleys 12. A weight 13, is attached to the other end of the cord and serves as a counterbalance for the panel and as a means for holding the panel in open or raised position as shown in Fig. II.

A perforated pipe 14, extends from end to end of the tank and is journaled for rotation in suitable bearings formed in the walls. At the left hand end of the machine, (Fig. I) this pipe terminates at 15 (Fig. IV) where it joins a stationary imperforated pipe 16. The ends of pipes 14, and 16, meet in a packing box which forms a liquid tight connection between them and at the same time allows the pipe 14 to freely rotate.

Attached to the end wall 2, is a plate 17, having a boss which projects through an opening in the said wall. A cap plate 18, is secured to the plate 17, and presses the packing 19, against the pipe 14. A second cap plate 20, presses a packing 21, against the end of the pipe 16. These cap plates

are secured to each other and to the plate 17, by suitable clamp bolts. The other end of the pipe 14, extends through the end wall of the tank and is journaled in a suitable liquid tight bearing therefor, and the protruding extension of this pipe supports a worm wheel 22, and is closed by a threaded cap 50. A shaft 23, carries a worm 24, which meshes with the worm wheel 22.

The drum 5, is rigidly attached to the tubular shaft 14. Extending from end to end of the drum are perforated walls 25, which form a compartment located centrally of the drum, and as herein shown, this compartment is six sided. Extending from the sides of the central compartment are radial partitions 26, which are also perforated. These radial partitions form pockets for the goods to be treated and these pockets are adapted to be closed by perforated sections 27. These perforated sections either in whole or in part are hinged as clearly shown in Fig. III. Suitable means are provided for holding the sections closed and a flexible support 28, may be used for holding the divided sections away from the drum when it is desired to gain access to the pockets.

As above noted, the end walls and the partitions forming the pockets in the drum are each perforated so as to permit a free circulation of the liquor for treating the goods. Extending through the tank at a point below the drum, is a perforated pipe 30. This pipe passes through suitable stuffing boxes in the tank walls and protrudes slightly beyond the end wall 1, and is closed by a suitable cap 31.

A vertical pipe 32, is adapted to be connected with a suitable supply tank for the treating liquor. This vertical pipe connects with a rotary pump 33, which is in turn connected through a pipe 34, with the pipe 30, having a hand valve 35. The vertical pipe 32, communicates by means of a pipe 36, with pipe 16, which is provided with a hand valve 37. A pipe 38, serves as a cross connection between the pipes 34, and the pipe 16, and a hand valve 39, controls said cross pipe. A second cross pipe 40, connects the pipe 32, with the pipe 30, and a hand valve 41, controls said second cross pipe.

By properly manipulating the several hand valves, the liquor may be drawn out through the perforated pipe in the bottom of the machine, then forced in through the perforated pipe at the center of the drum, thereby allowing the liquor to pass outward through the goods contained in the various pockets of the drum. Then again, by properly manipulating the valves, the liquor may be caused to circulate in the opposite direction, that is, enter the tank through the bottom thereof and return to the circulating

means through the pipe at the center of the drum. By closing the valve which controls the feed of the central pipe, the liquor may be pumped from the perforated pipe at the bottom thereof up into the storage tank and thus empty the apparatus and save the liquor for another operation.

While the apparatus is especially adapted for dyeing goods, it may also be used as above noted, for washing, bleaching or other treatment. In dyeing, however, it is often desirable to keep a standing bath as better results are thereby obtained than by mixing a fresh bath for each dyeing operation. The withdrawing of the liquor as above described permits same to be used over and over again.

The above apparatus is especially adapted for operations wherein the rotating drum is wholly submerged in the treating liquor. By closing the front panel or door which makes a liquid tight connection with the side wall of the tank a tight receptacle is formed, into which the liquor for treating goods may be forced so as to fill the tank to a point above the drum so that during the entire treatment, the goods are entirely submerged in the treating liquor. This apparatus is particularly adapted for dyeing stockings and when the drum is entirely submerged, the contents are continuously floating and this facilitates the passage of the dye liquor through the same. The goods, furthermore, do not have an opportunity to tumble and slide around in the pockets and consequently there is no tendency on the part of the apparatus to roughen or tear the goods.

When it is desired to obtain access to the goods, the treating liquor is in part, or as a whole, drawn from the tank and pumped to the storage receptacle and this permits the panel or door to be opened so that access may be had to the drum, in the manner above described. While the apparatus is especially adapted for the treatment of goods which are entirely submerged, it is to be understood that by regulating the amount of treating liquor the level of the liquor may be such that the goods will pass through the liquor during the rotation of the lower portion of the cylinder or drum and be out of the liquor as the pockets pass through the upper portion of their rotation.

The shaft 23, for driving the drum is connected by suitable clutch mechanism comprehensively indicated at 42, with a driving shaft having a driving pulley 43. A loose pulley 44, is mounted adjacent the driving pulley 43, and a belt shift lever 45, may be used for shifting the belt from one pulley to the other. A shifting lever 46, actuates the clutch mechanism 42, so that the drum may be driven at different speeds, or its direction of rotation reversed, if de-

sired. It is often desirable to drive the drum at one speed when dyeing and at another speed when washing or softening or some other process. This can be readily accomplished by the clutch mechanism above referred to.

As a suitable means for heating the liquor, we have provided steam pipes 47, which pass into the tank adjacent the bottom thereof and these steam pipes are controlled by suitable valves outside the tank.

In actual practice, sediment collects in these machines, due to the liberation of lint and threads from the fabric being treated, also to undissolved portions of the chemicals used and impurities in the liquor. For this reason the ends of pipes 14, and 30, are respectively provided with caps 50 and 31, so that access may be had to their interiors to permit cleaning.

It is obvious that minor changes in the details of construction may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described our invention, we claim:

1. A fabric treating apparatus including in combination a tank having end walls, a perforated pipe extending from one end wall to the other through which the treating liquor may be delivered to or withdrawn from the tank, a carrier mounted on said perforated pipe, said carrier having perforated walls inclosing the pipe, pockets formed in the carrier for the goods to be treated, said pockets being separated by perforated radial walls and closed by perforated outer walls, a second pipe extending along the bottom of said tank, and means whereby the treating liquor may be caused to circulate in either direction from one pipe to the other and through the perforated walls of the carrier.

2. A fabric treating apparatus including in combination a tank having end walls, a perforated pipe extending from one end wall to the other through which the treating liquor may be delivered to or withdrawn from the tank, a carrier mounted on said perforated pipe, said carrier having perforated walls inclosing the pipe, pockets formed in the carrier for the goods to be treated, said pockets being separated by perforated radial walls and closed by perforated outer walls, a second perforated pipe extending from one end wall to the other in said tank, and means whereby the treating liquor may be caused to circulate in either direction from one perforated pipe to the other and through the perforated walls of the carrier, said tank having an opening in the side wall thereof, the lower edge of which is substantially on a line of the perforated pipe supporting the carrier, and means for closing said opening.

3. A fabric treating apparatus including
in combination a tank, or container for the
treating liquor, a perforated drum adapted
to be rotated while submerged within the
5 liquor in the said tank, a perforated pipe
forming the axis of the said drum, a perfo-
rated pipe extending along the bottom of
the said tank, means for circulating the
liquor in either direction between the said
10 pipes, and a removable cap for the end of
the said pipe at the bottom of the tank to
permit access for cleaning.

4. A fabric treating apparatus including
in combination a tank or container for the
15 treating liquor, a perforated drum adapted
to be rotated while submerged in the liquor
in the said tank, said tank having an open-
ing in one of its walls, a door or panel for

closing said opening, means for clamping
the said door into closed position, said 20
means including strips mounted adjacent the
edges of the door, and corresponding strips
mounted adjacent the edges of the opening
in the wall of said tank, bridging pieces
adapted to be spanned between said strips, 25
and devices for forcing the bridging pieces
into position against the said strips.

In testimony whereof, we have hereunto
signed our names at Philadelphia, Penn-
sylvania, this first day of October, 1914.

THOMAS ALLSOP.
WALTER W. SIBSON.

Witnesses:

JAMES H. BELL,
E. L. FULLERTON.