

No. 701,119.

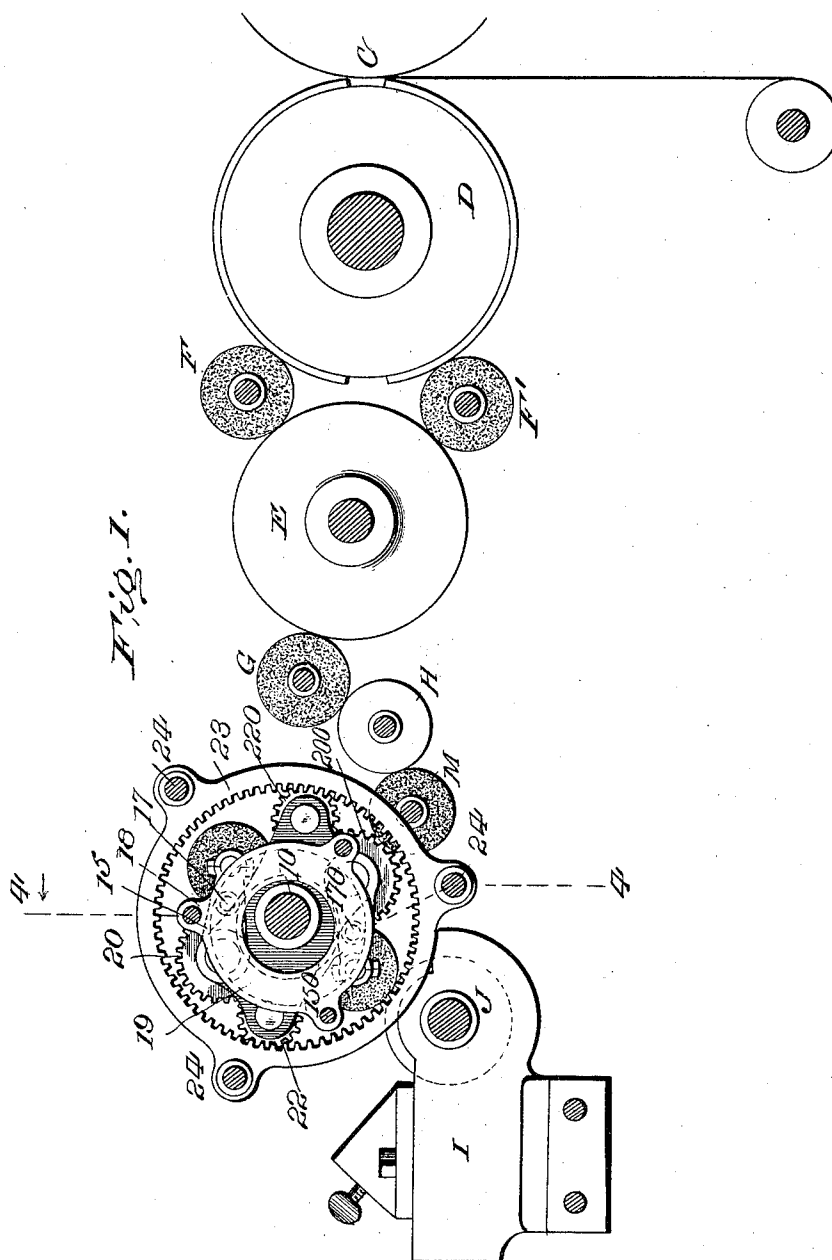
Patented May 27, 1902.

H. A. W. WOOD.
INKING APPARATUS.

(Application filed Mar. 4, 1898. Renewed Oct. 12, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses,

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Jas. Smith
H. E. Bowell

Inventor.

H.A.W. Wood

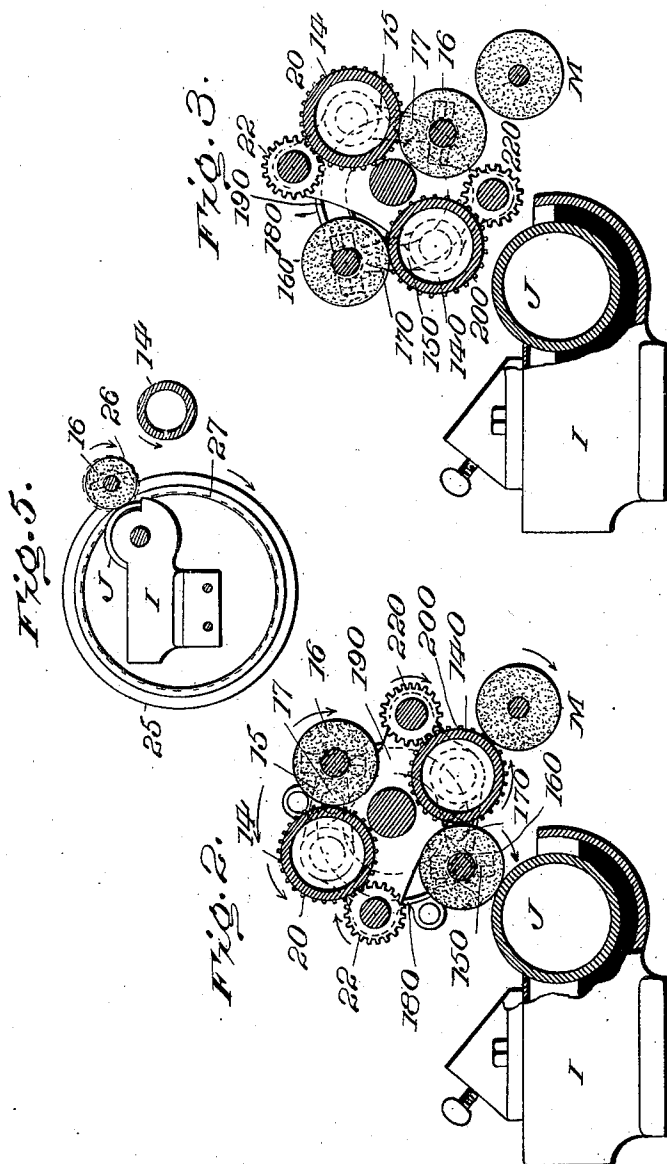
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3 Sheets—Sheet 2.



Witnesses,

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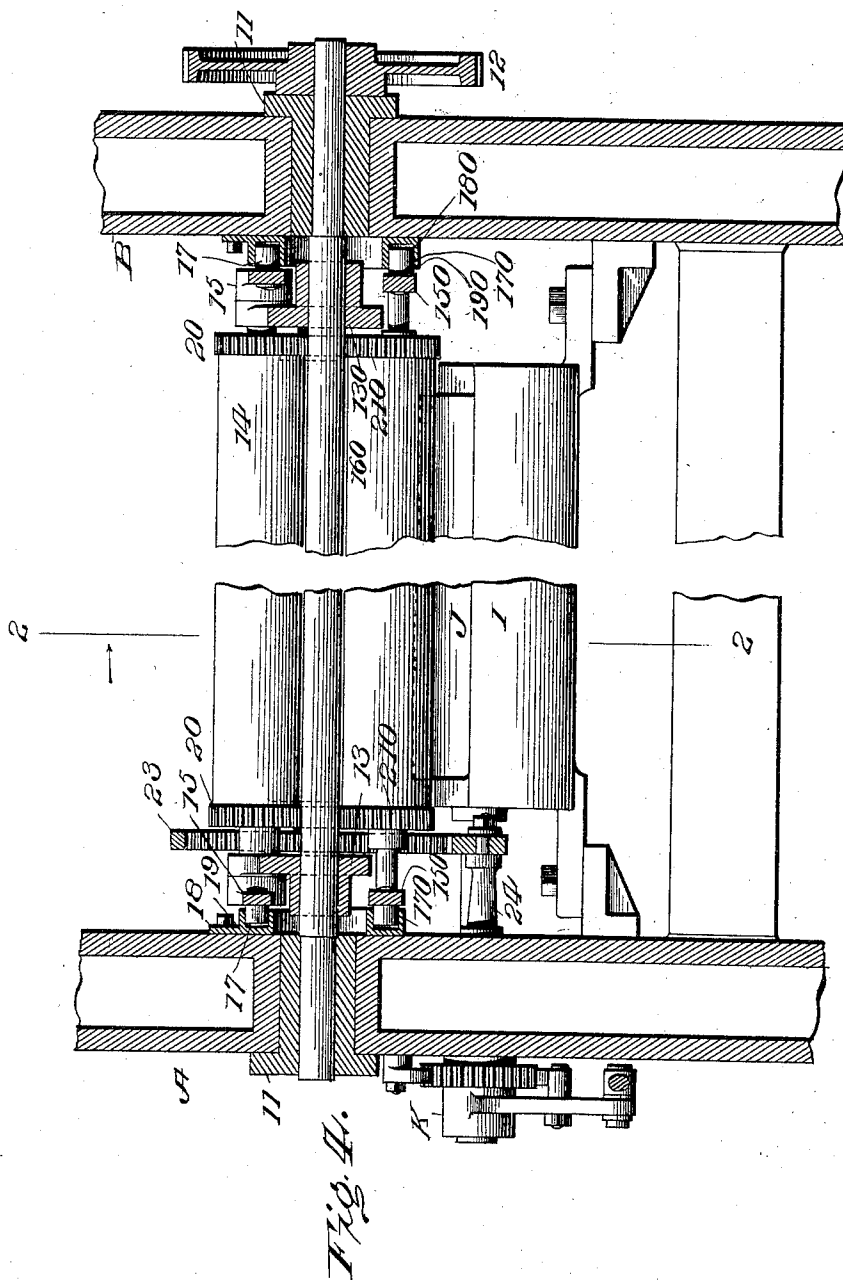
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3 Sheets—Sheet 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY A. WISE WOOD, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

INKING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 701,119, dated May 27, 1902.

Application filed March 4, 1898. Renewed October 12, 1901. Serial No. 78,504. (No model.)

To all whom it may concern:

Be it known that I, HENRY A. WISE WOOD, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Inking Apparatus, of which the following is a specification.

The aim of this invention is to improve inking apparatus, especially the inking apparatus used on fast rotary printing-machines, and the invention relates especially to a ductor mechanism for taking the ink from the ink fountain or supply.

The ordinary ductor-roller mechanism, such as is used in connection with the ordinary rotary press, consists of a roller which reciprocates or oscillates between the fountain-roller, which is motionless, or approximately so, and a fast-running distributor or receiving roller. In other words, the ductor-roller has to contact at one point of its oscillation with a stationary roller and at the other point of its oscillation has to contact with a rapidly-running distributor-roller. As a result the ductor-roller, which is made of glue and molasses and which is loosely journaled in its bearings or arms, in a short time is battered or twisted to pieces and requires replacing frequently, as when the ductor contacts with the fast-running distributor it must start in motion therewith, and when the same contacts with the substantially stationary fountain-roller this rotation must be stopped. To run any length of time with this ordinary construction the ductor-roller must be made very hard and solid, and this in itself prevents good inking, for to do good inking a roller must have a soft surface. Again, in ordinary constructions it is not possible to oscillate the ductor-roller faster than once for every four turns of the plate-cylinders, and therefore at each trip the ductor-roller must carry ink enough for eight papers—in other words, a lump. When, as is soon going to be the case, the speed of the commercial rotary web-press is doubled or greatly increased, the number of reciprocations to a revolution of the plate-cylinders must be reduced, necessitating a greater load of ink at each trip. In view of these difficulties the aim of my invention is

to provide a ductor which is rotary in action and which is so rotated that the same will roll over the fountain-roller without slippage and so that the same will contact with the distributor or receiving roller and will turn therewith, so that there will be substantially no strain put upon the periphery of the ductor-roller. In other words, the driving means for the ductor-roller is so arranged that the ductor will run in an orbit over the fountain-roller and turn with the receiving-roller. Further, by making the ductor-roller rotate orbitally I can do away with oscillations or reciprocations and provide a much faster running device, and also can use a plurality of ductor-rollers to take the ink from the fountain, and I can provide as many supplies of ink as desired for each revolution of the plate-cylinders. By my arrangement the ductor is rotary in every sense of the word. To understand this operation which I have thus described, I will refer first to a small diagram to illustrate this action before describing the apparatus, which I consider the best mode of applying the principle of my invention, and this diagram is shown in Figure 5 of the drawings. In this figure, 1 represents a fountain, and J the fountain-roller thereof. 16 represents a ductor, and 14 a receiving-drum or distributor-cylinder. The ductor-roller 16 is mounted in rings 25, which are rotated around their center. The ductor-roller carries a pinion 26, which meshes with a stationary gear 27. (Dotted lines.) Suppose now that the velocity of rotation of the ductor is three hundred and fifty feet a minute, and suppose that the distributor or receiving cylinder 14 has a peripheral velocity of seven hundred feet per minute. Now as the ductor-roller turns around its center of rotation it will also turn on its axis, and in doing so will roll over the face of the fountain-roller, and thus take ink without stopping or slippage. Having taken ink in its descent, its outer surface contacts with the receiving-cylinder, and as the receiving-cylinder turns in the same direction and with the same velocity as the outside of the ductor a transfer of ink takes place between the ductor-roller and the receiving-cylinder in the

most natural manner. Thus a rotary transfer of ink is obtained without either starting, stopping, or reciprocating the ductor-roller. It also will be seen that by this mechanism a

- 5 small and nicely-distributed supply of ink can be carried from the fountain-roller to the receiving-cylinder and that the parts being essentially rotary in action may be driven at a high rate of speed. It also will be seen that
10 as many ductor-rollers may be used in the device as desired. While this diagram illustrates the principle of my invention and such construction is within the scope of my claims, I prefer to use a different form of apparatus
15 in practical use, because in the device of the diagram the ductor or ductors rotate around the fountain and prevent access to the adjusting-screws of the fountain while the machine is in operation, and also by using a
20 form of apparatus hereinafter described I avoid carrying the ductor roller or rollers into and out of contact with the receiving-roller.

- Referring to the accompanying three sheets of drawings, which form part of this specification, Fig. 1 is a sectional diagram just inside of one of the side frames of a press, showing my improved apparatus. Fig. 2 is a sectional diagram of my improved inking apparatus, taken on the line 2 2 of Fig. 4. Fig.
30 3 is a view similar to Fig. 2, showing the parts in a different relative position. Fig. 4 is a cross-sectional elevation taken on the line 4 4 of Fig. 1, and Fig. 5 is the diagram before referred to.

- 35 Referring now to the first four figures, which illustrate what I deem the best way now known to me to practically carry out my invention, A and B represent the ordinary side frames of the machine. C represents the impression-cylinder, D the plate-cylinder, E the ink-drum, and F and F' the form-rollers which form part of the first printing-couple of a rotary web-press of any construction.

- G represents a composition roller which
45 bears on the ink-drum E, and H represents an iron or steel drum on which the composition roller G bears.

- M represents a composition roller used for a purpose hereinafter described.

- 50 I represents an ink-fountain of any desired form, and J the roller thereof. This roller is given a slight turn or part of a revolution at intervals by any of the usual ratchet mechanisms, as K, the details of which it is
55 not necessary to describe at length, so that the ink will be taken from the fountain up onto the surface of the roller J, or the roller J may be driven continuously at a slow speed.

- 10 represents a shaft which is mounted in
60 bearings 11 in the side frames A and B and which has a gear or pinion 12 on the end thereof, by which the same is continuously rotated. Mounted on this shaft 10 are suitable arms or plates 13 and 130. Journaled in these
65 plates are two iron or steel receiving-rollers 14 and 140. On the shafts of these receiving-rollers are fastened arms 15 and 150, in which

are mounted ductors 16 and 160. I have shown two ductors arranged in this way, although, of course, one or any number may be
70 used as desired.

The arms 15 carry rollers 17, and the arms 150 carry similar rollers 170. These rollers fit in disks 18 and 180, which have circular grooves 19 and 190 cut therein, and these
75 disks are set eccentrically to the shaft 10 and are secured to the insides of the side frames, as shown.

The receiving-roller 14 has gears 20 20, arranged on the ends thereof, and the receiving-roller 140 has gears 200 200 arranged on the ends thereof. A driving-pinion 22 is arranged to mesh with one of the gears 20, and a driving-pinion 220 is arranged to mesh with one of the gears 200. These driving-gears 22 and
85 220 are meshed into an internal gear 23, which is secured to one of the side frames by means of supports 24, as shown.

The ductor 16 is rotated by bearing on the receiving-roller 14, and the ductor 160 is rotated by bearing on the receiving-roller 140.
90

In some cases the ductors and receiving-rollers may be geared together; but it is preferred in most instances to drive the ductor-rollers by surface contact with the receiving-
95 rollers. If the ductor-rollers are to be geared to the receiving-rollers, the ductor-rollers will be provided with gears on their ends to mesh with the gears on the receiving-rollers. Such gears 210 210 are shown on the ends of the
100 ductor-roller 160 in Fig. 4.

I do not always propose to use two gears 20 20 on the ends of the receiving-roller 14, or two gears 200 200 on the ends of the receiving-roller 140, as the rollers can be driven by being geared at one end only; but for presses of great width the gearing at both ends is desirable. When gearing at both ends of the receiving-rollers is used, the shafts on which the pinions 22 and 220 are mounted are extended between the plates 13 and 130, and two driving-pinions 22 and 220 are provided to mesh with the gears 20 and 20 and 200 and 200 on the ends of the receiving-rollers.
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I preferably use an internal gear on only one side of the machine, although of course it is within the scope of my invention to use an internal gear at each side.
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The operation of the device is as follows: The parts are so positioned that the receiving-rollers as the same rotate around the center of the shaft 10 will not touch the fountain-roller J, but will contact with the composition roller M. The ductor-rollers 16 and 160 being mounted in arms are controlled in position by the rollers 17 and 170 running in the grooves 19 and 190. The disks 18 and 180 are so placed that the ductors 16 and 160 will be moved outwardly to engage and roll over the surface of the fountain-roller J, as shown in Fig. 2, and will be moved inwardly to clear the composition roller M, as shown in Fig. 3. By this construction the ductors will take the ink from the fountain-roller and
120
125
130

give the same to the receiving-drums, and the receiving-drums will give the ink to the composition roller or cylinder M. The gearing is so proportioned that when a receiving-drum contacts with the composition roller M the speed of the receiving-drum will be the same as the peripheral speed of the composition roller M, so that there will be no slippage or strain put on the composition roller M. By this construction a rapid and accurate transfer of ink takes place and a device is provided in which substantially all strain is taken from each ductor-roller, as each ductor-roller is in constant contact with a receiving-drum and each receiving-drum contacts accurately with the composition roller M.

In some cases the rollers M and H may be omitted and the roller G used to take the ink from the receiving-drums; but I prefer generally to use three rollers M, H, and G, so as to get a further distribution of ink.

It will be seen that the inward and outward movement of the ductor-rollers will not disturb the rotation thereof, as such movement takes place about the axis of the receiving-drum, and also it will be seen that the gearing described provides a simple and neat form by which the ductors and receiving-drums are properly turned at the proper speed in the right direction.

The modification of my invention shown in the diagram Fig. 5 has been previously described.

Other forms of gearing and arrangements may be devised to work within the principle of my invention without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with an ink-supply, a rotating ductor taking ink from the roller thereof, and means for positively turning the ductor on its axis so that the same will roll over the surface of the supply-roller.

2. The combination with an ink-supply, rotating ductors taking ink from the roller thereof, and means for continuously and positively turning the ductors so that the same will roll over the surface of the supply-roller.

3. The combination with an ink-fountain, an orbitally-rotating ductor taking ink from the roller thereof, and a receiving-roller in constant engagement with the ductor-roller.

4. The combination with an ink-fountain, orbitally-rotating ductors taking ink from the roller thereof, and a receiving-roller in contact with each of the ductors.

5. The combination with an ink-fountain, a ductor taking ink from the roller thereof, a receiving-roller in constant contact with the ductor, and means for orbitally rotating the ductor and receiving-roller.

6. The combination with an ink-fountain, ductors taking ink from the roller thereof, a receiving-roller in constant contact with each

of the ductors, and means for orbitally rotating the ductors and receiving-roller.

7. The combination with an ink-fountain, a ductor, a receiving-roller in engagement with the ductor, a roller as M, and means for orbitally rotating the receiving-roller and ductor.

8. The combination with an ink-fountain, a plurality of ductors, a receiving-roller in engagement with each ductor, a roller as M, and means for orbitally rotating the ductors and receiving-rollers.

9. The combination with an ink-fountain, a ductor, a receiving-roller in engagement with the ductor, a roller as M, means for rotating the receiving-roller and ductor, and means for moving the ductor about the axis of the receiving-roller during its rotation.

10. The combination with an ink-fountain, a plurality of ductors, a receiving-roller in engagement with each ductor, a roller as M, means for rotating the ductors and receiving-rollers, and means for moving the ductors about the axes of their respective receiving-rollers during their rotation.

11. The combination with an ink-fountain, a ductor, a receiving-roller in engagement with the ductor, a rotating roller as M, means for axially rotating the ductor and receiving-roller, and means for orbitally rotating the ductor and receiving-roller so proportioned and arranged that the ductor will roll over the roller of the fountain, and so that the receiving-roller will engage the roller M and rotate therewith.

12. The combination with an ink-fountain, a plurality of ductors, a receiving-roller in engagement with each ductor, a rotating roller as M, means for rotating the ductors and receiving-rollers, and means for turning the ductors and receiving-rollers upon their axes, so proportioned and arranged that the ductors will roll over the fountain-roller and so that the receiving-rollers will engage the roller M, and rotate therewith.

13. The combination with an ink-fountain, a receiving-roller, arms mounted concentrically therewith and carrying a ductor-roller, means for rotating the receiving-roller and the ductor, a roller as M, and means for moving the ductor to engage the roller of the fountain and to clear the roller M, consisting of grooved disks, and rollers mounted on the arms that carry the ductor engaging said disks.

14. The combination with an ink-fountain, a plurality of receiving-rollers, a ductor in engagement with each receiving-roller, and means for rotating the receiving-rollers and ductors, a roller as M, and means for moving the ductors to engage the roller of the fountain and to clear the roller M, consisting of grooved disks, and rollers arranged on said arms engaging said disks.

15. The combination with an ink-fountain,

a ductor and receiving-roller bearing on each other, a gear on the receiving-roller, a pinion engaging the same, means for revolving the ductor-roller, receiving-roller and pinion, and
 5 a stationary internal gear with which said pinion meshes, whereby the ductor-roller and the receiving-roller will be turned upon their axes as the same are rotated.

16. The combination with an ink-fountain,
 10 a plurality of receiving-rollers, a ductor-roller in engagement with each of the receiving-rollers, a gear on each receiving-roller, a pinion engaging the gear of each receiving-roller, means for rotating the ductors, receiving-
 15 rollers and pinions, and a stationary, internal gear with which said pinions mesh, whereby said ductor-rollers and receiving-rollers will be turned on their axes as the same are rotated.

20 17. The combination with an ink-fountain, a receiving-roller and a ductor-roller, means for rotating the same, gearing whereby said

ductor-roller and said receiving-roller will turn on their axes as they are rotated, a roller as M, and means for moving the ductor-roller 25 in its rotation so that the same will engage the fountain-roller and will clear the roller M.

18. The combination of an ink-fountain, a plurality of receiving-rollers, a ductor engaging each receiving-roller, means for rotating 30 the receiving-rollers and ductors, gearing whereby the receiving-rollers and ductors will turn on their axes as they are rotated, a roller as M, and means for moving the ductors in their rotation so that they will engage 35 the fountain-roller and clear the roller M.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

H. A. WISE WOOD.

Witnesses:

HENRY W. COZZENS, Jr.,
 LAURA W. SOUTHGATE.