B. W. ALLEN.

MACHINE FOR PRINTING DIRECTLY ON THE SURFACES OF BOTTLES.

APPLICATION FILED NOV. 20, 1908.

927,762. Patented July 13, 1909.

3 SHEETS—SHEET 1.

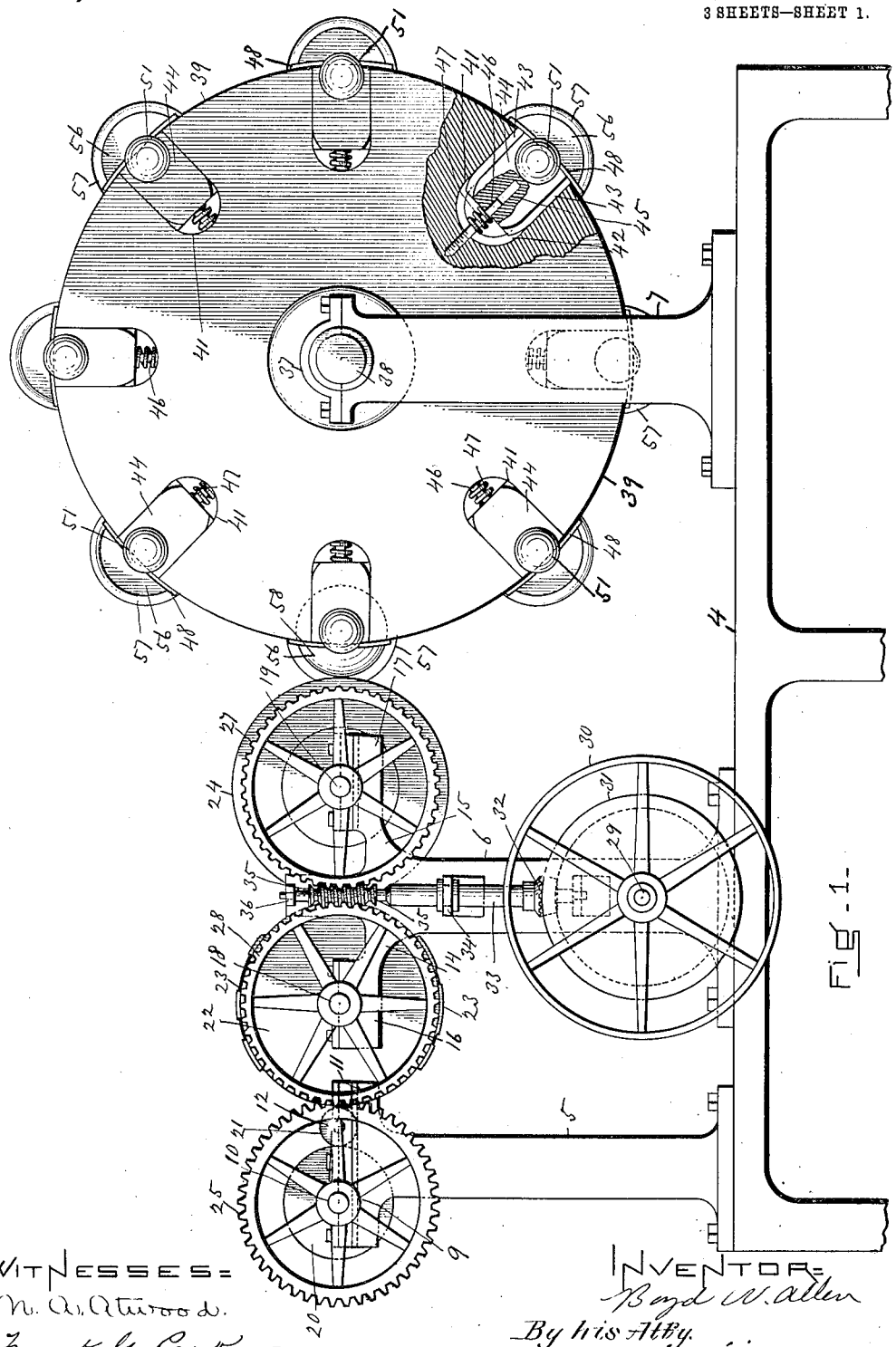


Fig. 1.

WITNESSES:

M. A. Attwood.

Frank G. Parker

INVENTOR:

Boyd W. Allen

By his Atty.

Henry W. Williams

B. W. ALLEN.

MACHINE FOR PRINTING DIRECTLY ON THE SURFACES OF BOTTLES.

APPLICATION FILED NOV. 20, 1908.

927,762. Patented July 13, 1909.

3 SHEETS—SHEET 2.

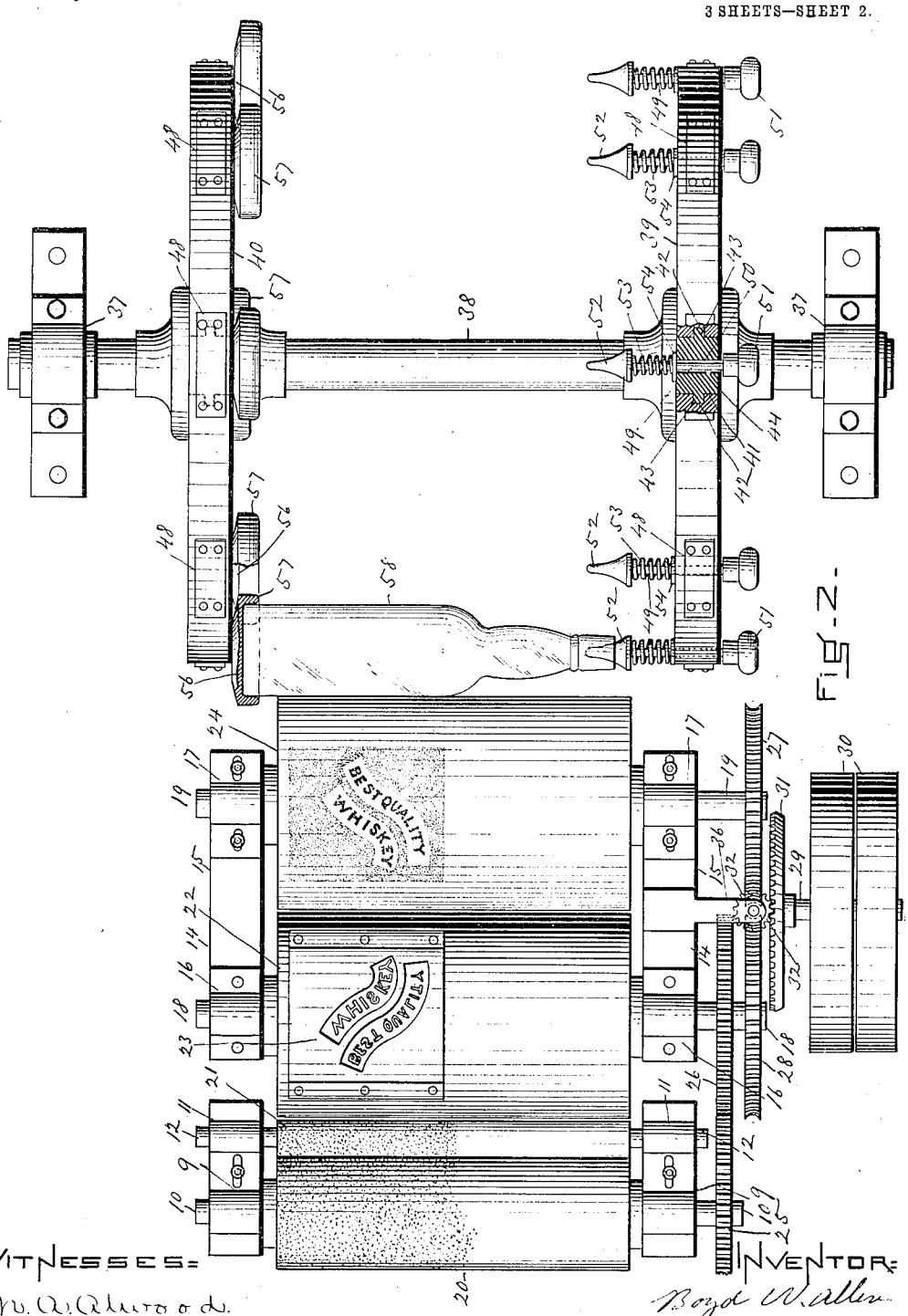


Fig. 2.

WITNESSES:

W. A. Alvord Jr.

Frank G. Parker

INVENTOR:

Boyd W. Allen

By his Atty.

Albert E. Williams

B. W. ALLEN.

MACHINE FOR PRINTING DIRECTLY ON THE SURFACES OF BOTTLES.

APPLICATION FILED NOV. 20, 1908.

927,762. Patented July 13, 1909.

3 SHEETS—SHEET 3.

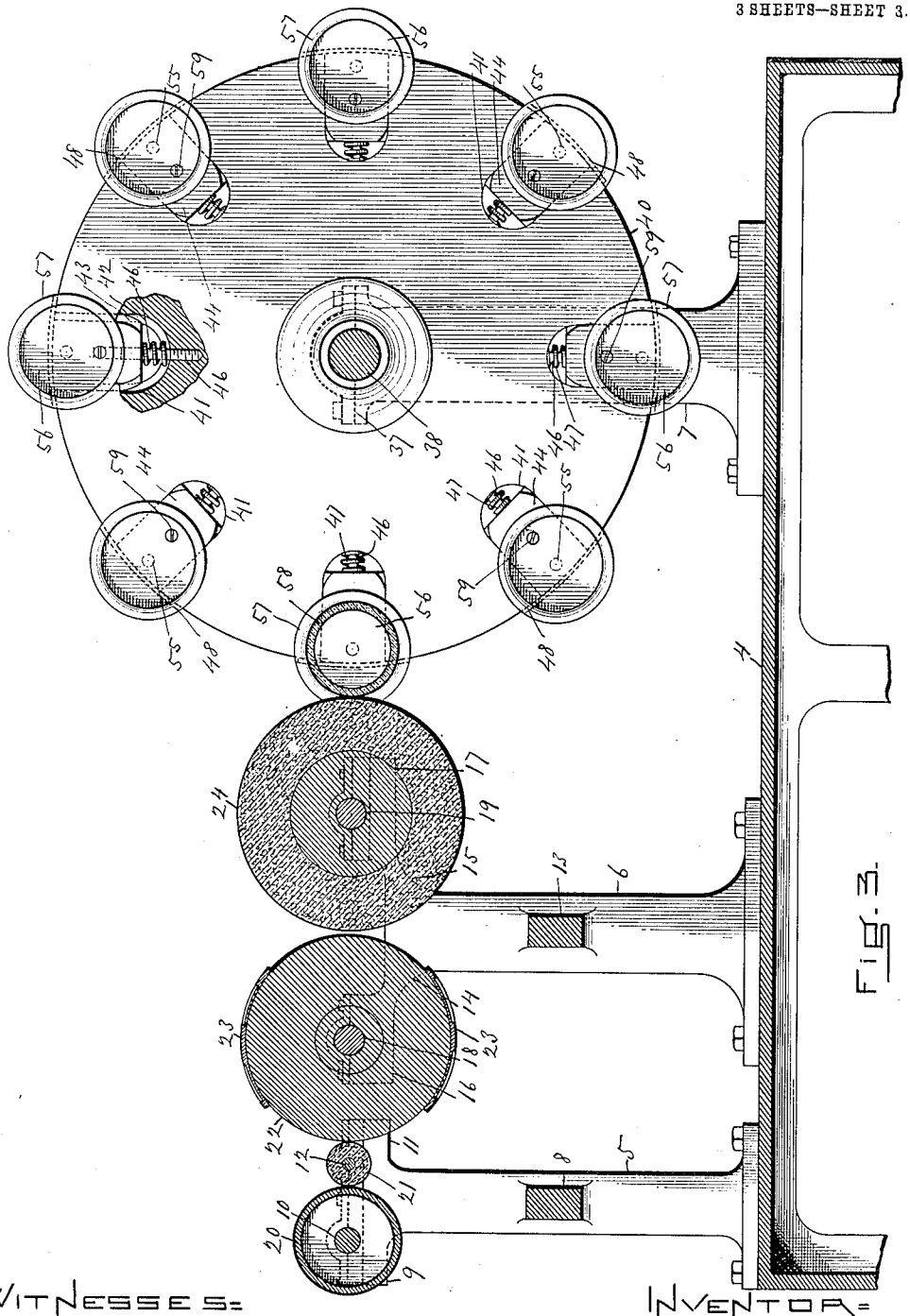


Fig. 3.

WITNESSES:

Wm. A. Atwood.

Frank G. Parker.

INVENTOR:

Boyd W. Allen,

By Luis. Gray.

Attorney

UNITED STATES PATENT OFFICE.

BOYD W. ALLEN, OF BOSTON, MASSACHUSETTS.

MACHINE FOR PRINTING DIRECTLY ON THE SURFACES OF BOTTLES.

No. 927,762. Specification of Letters Patent. Patented July 13, 1909.

Application filed November 20, 1908. Serial No. 463,615.

To all whom it may concern:

Be it known that I, BOYD W. ALLEN, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Machine for Printing Directly on the Surfaces of Bottles, of which the following is a specification.

This invention relates to a machine for printing directly on the surfaces of bottles, more especially on glass bottles. In other words, by means of this machine, instead of printing labels and afterward adhesively securing the labels to the surfaces of the bottles, the printing is done directly on the bottles.

The invention consists of the novel construction and arrangements of parts hereinafter described, and illustrated in the accompanying drawings, whereby this result is produced.

In the drawings, Figure 1 is a side elevation of a machine embodying my invention, a small portion being represented as broken out. Fig. 2 is a plan view of the same with a small portion broken out, and one bottle supported in the machine, and in position to receive an impression. Fig. 3 is a longitudinal vertical section with a portion broken out.

Similar numerals of reference indicate corresponding parts.

Reference-numeral 4 represents a bed or table and 5, 6 and 7 represent respectively three pairs of standards. The standards 5 are connected by suitable cross-pieces 8 and serve to support a pair of boxes 9 in which a horizontal shaft 10 has its bearings, and also boxes 11 in which a horizontal shaft 12 has its bearings. The standards 6 are connected by a suitable cross-piece 13 and are provided at their upper ends with branches 14 and 15 which respectively support boxes 16 and 17 in which horizontal shafts 18 and 19 have their bearings. Rigid on the shaft 10 and carried thereby is an ink-roll or supply-roll 20; rigid on the shaft 12 is a small distributing-roll 21 made preferably of gelatin; rigid on the shaft 18 is a type-roll 22, preferably having a metallic surface, and provided with a plate of the desired shape and having a selected inscription, an illustration of such a plate being indicated at 23; and rigid on the shaft 19 is a transferring-roll 24, made preferably of gelatin. Rigidly mounted on the shafts 10, 18 and 19 respectively are gear-wheels 25, 26 and 27, and rigidly mounted on the extreme end of the shaft 18 is another gear-wheel 28 (see Fig. 2).

A driving-shaft 29 is suitably supported by the frame of the machine, and is provided with the ordinary pulleys 30, and rigid on this shaft is a bevel-gear-wheel 31 which engages a small bevel-gear or pinion 32 rigid on the lower end of a vertical shaft 33 supported in a suitable bracket 34 extending from the frame, the upper end of this shaft 33 being supported in a bracket 36 and being provided with a worm 35 which extends between and engages the gear-wheels 28 and 27.

It is evident that by applying power to the pulleys on the driving-shaft 29 the gear-wheels 28 and 27 are rotated by the worm, and the type-roll 22 and transferring-roll 24 rotated by the shafts 18 and 19 respectively. By means of the gear-wheel 26 rotation is imparted to the gear-wheel 25 which by means of the shaft 10 rotates the ink-roll 20. As the rolls 22 and 24 are in contact with each other, and the rolls 20 and 21 are in contact with each other, the ink-roll or supply-roll 20 transfers the ink on its surface to the distributing-roll 21 which is rotated by friction, and the ink is transferred to the plate 23 on the type-roll which transfers an impression to the transferring-roll 24.

The pair of standards 7 support by means of boxes 37 a horizontal shaft 38 on which are mounted a pair of large disk-wheels 39 and 40. These disk-wheels are provided with peripheral and radial slideways 41 formed with grooves 42 in their edges which accommodate the opposite tongues or wings 43 of radially sliding blocks 44. These blocks are provided with longitudinal sockets 45 which receive the outer ends of screw-pins 46, said pins screwing at their inner ends into the disk-wheels at the inner ends of the slideways. Spiral springs 47 lie between the inner ends of the sliding blocks and the bottoms of the slideways and hold said blocks normally outward against plates 48 which are secured to the peripheries of the disks against the outer ends of the blocks. Horizontal pins or spindles 49 extend through suitable holes 50 in the blocks which are contained in the disk-wheel 39, the outer ends of the pins being provided with knobs or heads 51 and the inner ends extending beyond the inner surface of said disk-wheel 39 (see Fig. 2) and being provided with approximately cone-shaped guides or holders 52. Spiral springs 53 are disposed on these pins between the

outer ends of the holders 52 and the washers 54 which are next the inner sides of the blocks. The sliding blocks 44 in the disk-wheel 40 are exactly opposite and register with the sliding blocks in the disk-wheel 39, and the sliding blocks in the disk-wheel 40 have centrally secured to their inner sides at the dotted lines 55 (Fig. 3) shallow cup-shaped sockets 56 whose circular sides or flanges 57 (Fig. 2) are of size and shape to receive the large or closed end of a bottle, the cone-shaped guides or holders 52 being of suitable size and shape to be inserted in the neck of the bottle. In Fig. 2 a bottle 58 is illustrated in position between the disk-wheels, and one of the sockets 56, 57 is shown in section and another as broken out, the better to illustrate its shape. Preferably the cup-shaped sockets 56 are screwed at 59 to the sliding blocks 44 in order to prevent rotation of the sockets.

The bottles are held between the sockets 56 and holders 52, one bottle only being illustrated in the drawings although preferably all the holders and sockets will be employed, so that there will be a circular row of bottles each of which extends somewhat beyond the peripheries of the disk-wheels as shown, said wheels being so located with relation to the transferring-roll 24 that the bottles when at the same level with said roll will come in frictional contact therewith and be rotated thereby. It will be noticed that these bottles are not rigidly held in position but are held yieldingly in position inasmuch as the holding mechanism is supported directly in and by the supporting and sliding blocks 44. These sliding blocks are capable of being moved radially inward against the power of the springs 47, and hence as a bottle is moved into contact with the transferring-roll 24 it can yield to the pressure of said roll and be pressed slightly toward the shaft 38 by the yielding of the sliding blocks 44 which support the opposite ends of the bottle by means of the sockets 56, 57 and the holder 52 Moreover the holders 52 are adapted to yield by pressure against the springs 53 in order that the bottles may be inserted in the position illustrated by pulling on the knobs 51, and, to a certain extent to accommodate bottles of slightly different lengths. The conical shape of the holders 52 is convenient as enabling the holders to extend well into the neck of the bottle and also to accommodate bottles of slightly varying lengths and diameter of mouth.

In practical operation, power being imparted to the driving-shaft 29, rotation is imparted by means of the gears 31, 32, shaft 33, worm 35, gears 28, 26 and 25 and the shaft 10 to the ink-roll or supply-roll 20 which operates as a friction-roll and rotates the distributing-roll 21, which also takes the ink from the roll 20, and directly by means of the shaft 18 the type-roll 22 is rotated, and at the same time by means of the gears 31, 32, shaft 33, worm 35, gear 27 and the shaft 19 the transferring-roll 24 is rotated, said transferring-roll receiving the inscription from the type-roll. The disks 39 and 40 are rotated independently of the transferring-roll, preferably by hand power, the peripheries of the disks being grasped by the operator, or, if desired, any suitable mechanical power may be employed. As the disks are turned the bottles 58 are brought one after another against the surface of the transferring-roll and are rotated by the frictional contact with said roll until they receive directly on the glass or body of the bottle the inscription on the transferring-roll.

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

1. In a machine of the character and for the purpose described, a horizontal shaft, a pair of wheels mounted on said shaft and adapted to carry a series of bottles disposed horizontally between and supported by the wheels with their sides extending beyond the peripheries of said wheels, an ink-supplying-roll, a distributing-roll, a type-roll, a transferring-roll adapted to come into frictional contact with the sides of the bottles as the wheels are rotated, and mechanism for operating the rolls whereby the inscription on the transferring-roll is applied directly to the sides of the bottles successively.

2. In a machine of the character and for the purpose described, a horizontal shaft, a pair of wheels mounted on said shaft, sliding-blocks supported by the wheels near their peripheries, spring-mechanism intermediate of the blocks and the wheels whereby said blocks are held normally outward but are adapted to yield and be moved inward on substantially radial lines, mechanism supported by said sliding-blocks on one wheel for sustaining the bottoms of the bottles and on the other wheel for sustaining the necks thereof whereby the bottles are rotatively supported near the peripheries of the wheels, and printing mechanism for applying printed matter directly to the surfaces of the bottles as the wheels are rotated.

3. In a machine of the character and for the purpose described, a horizontal shaft, a pair of wheels mounted on said shaft, sliding-blocks supported by the wheels near their peripheries, spring-mechanism intermediate of the blocks and the wheels whereby said blocks are held normally outward but are adapted to yield and be moved inward on substantially radial lines, cup-shaped sockets secured to the inner surfaces of the sliding-blocks supported by one of the wheels for sustaining the bottoms of the bottles, supports for sustaining the necks of the bottles extending from the inner surfaces of the slid-

ing blocks on the opposite wheel, spring-mechanism intermediate of the neck-supports and the sliding-blocks whereby said supports may be withdrawn from engagement with the necks, and printing-mechanism for applying printed matter directly to the surfaces of the bottles and imparting individual rotation to said bottles as the wheels are rotated.

4. In a machine of the character and for the purpose described, a pair of disk-wheels provided with series of slideways extending substantially radially inward from their peripheries, the slideways in each disk-wheel corresponding in location with those in the other, sliding-blocks in said slideways, means for yieldingly holding said slideways normally toward the peripheries of the wheels, bottle-supporting mechanisms secured to the slides in the two disks and adapted to hold the bottles horizontally and rotatively between said disks, and printing mechanism including a transferring-roll which is held in the path of rotation of said series of bottles, whereby when the bottles are successively carried by the disks to the transferring-roll, said roll imparts rotation to the bottles and prints directly upon their surfaces.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BOYD W. ALLEN.

Witnesses:
HENRY W. WILLIAMS,
M. A. ATWOOD.