No. 834,696. PATENTED OCT. 30, 1906.

J. McC. WHITE.

DRIER.

APPLICATION FILED MAR. 16, 1906.

2 SHEETS—SHEET 1.

FIG. 1.

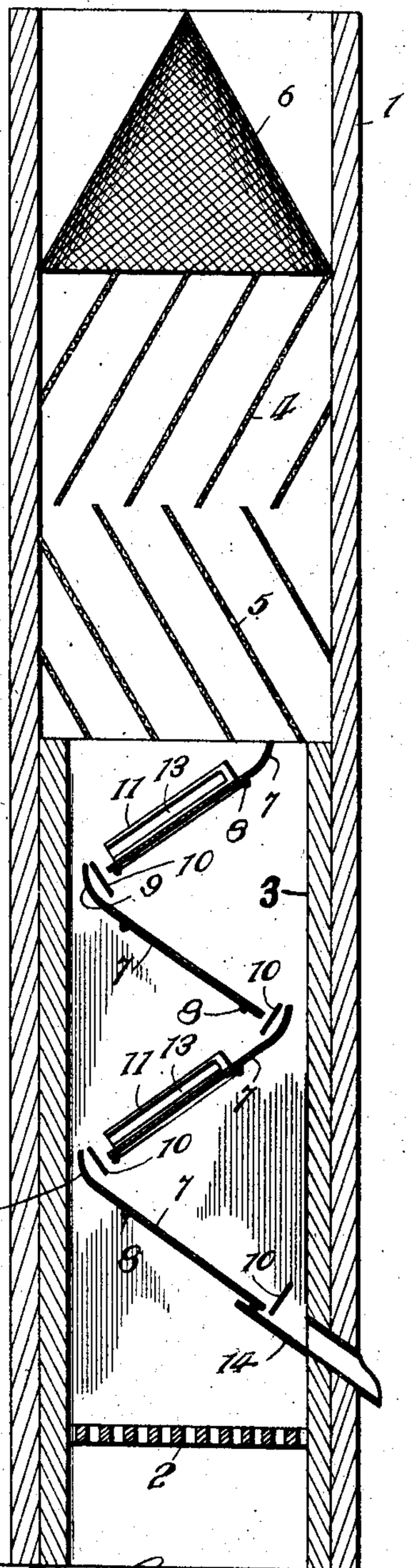
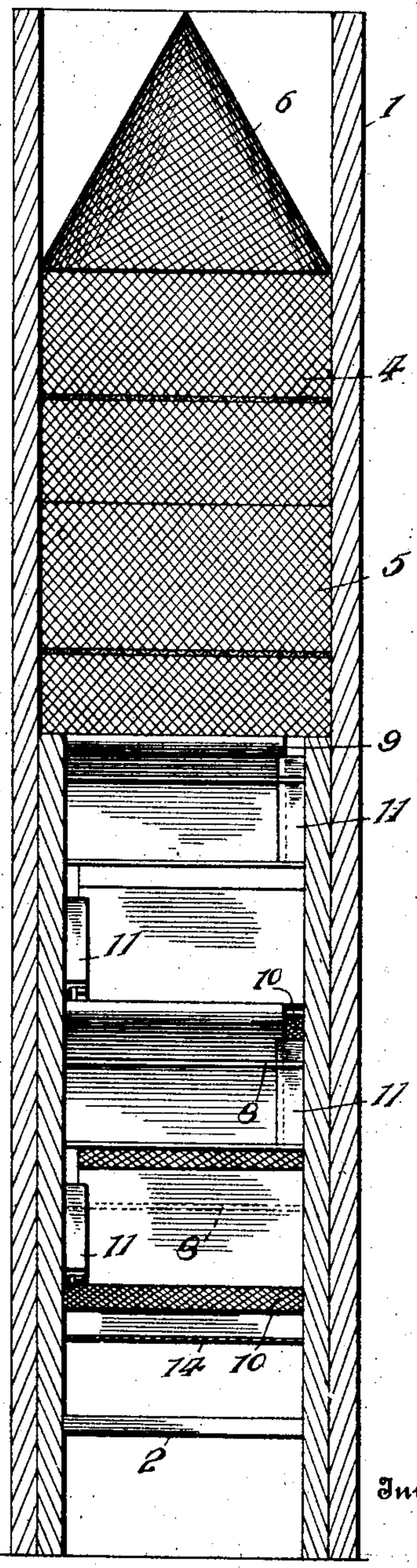


FIG. 2.



Witnesses
Floyd Conwell
E. Bradley

Inventor
John M. White
By Stewart & Stewart
Attorneys

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2 SHEETS—SHEET 2.

FIG. 3.

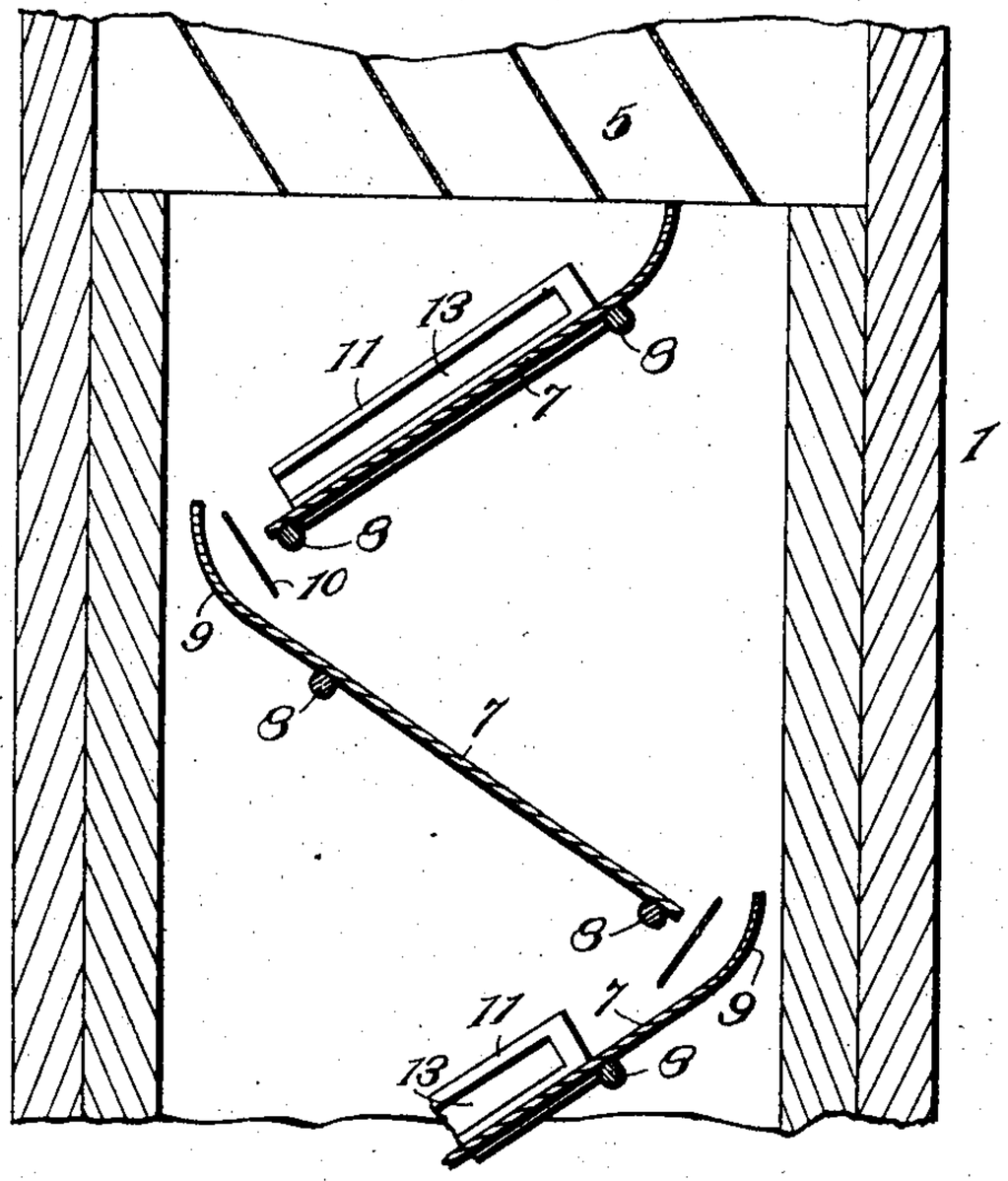
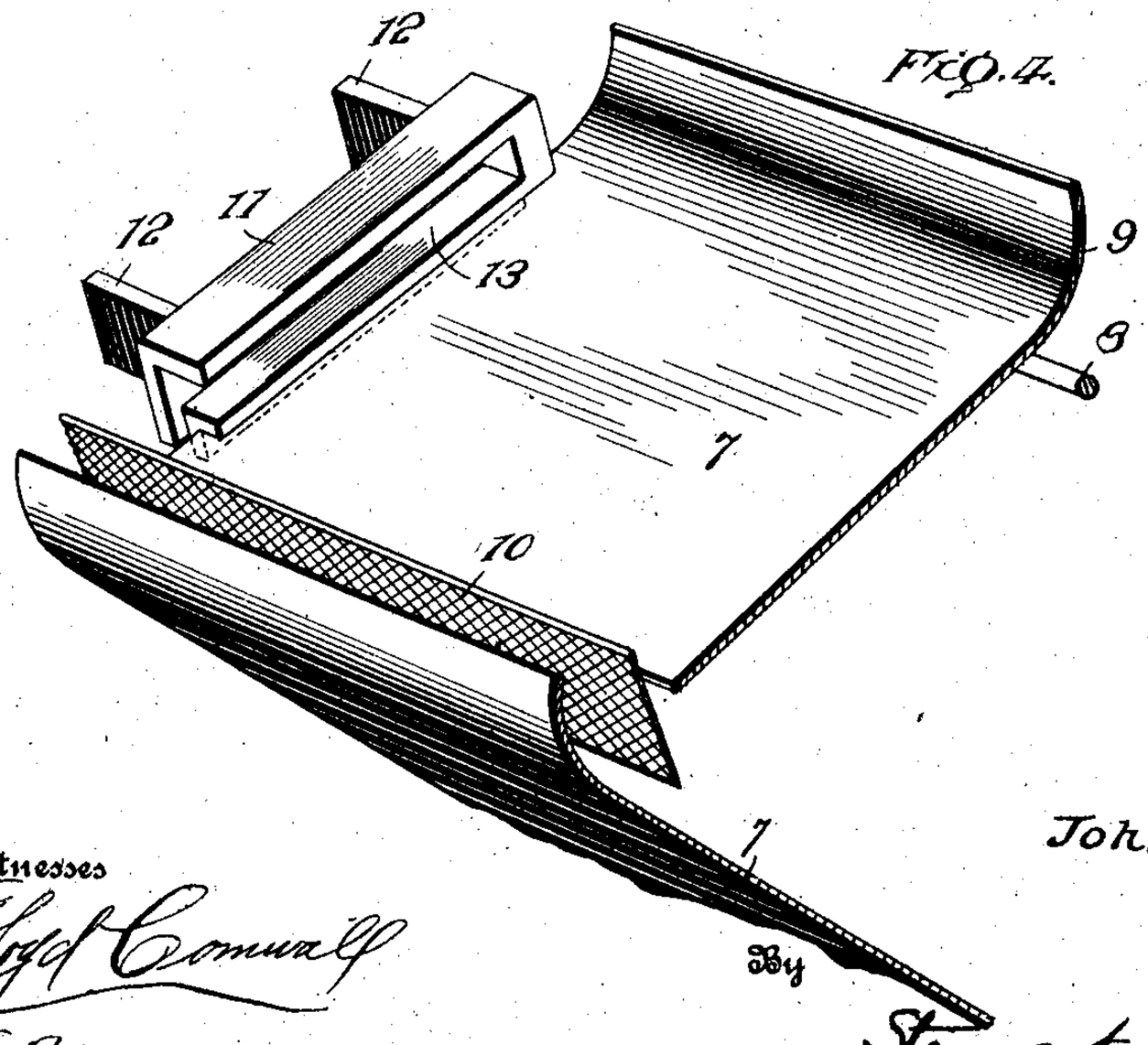


FIG. 4.



Witnesses
Floyd Connell
E. Bradley

Inventor
John M. White

By Stewart & Stewart
Attorneys

UNITED STATES PATENT OFFICE.

JOHN McCLURE WHITE, OF MAPLETON BOROUGH, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO FRANK O'CONNOR, OF MAPLETON DEPOT, PENNSYLVANIA, AND ONE-THIRD TO R. TYNE SMITH, JR., OF BALTIMORE, MARYLAND.

DRIER.

No. 834,696. Specification of Letters Patent. Patented Oct. 30, 1906

Application filed March 16, 1906. Serial No. 306,448.

To all whom it may concern:

Be it known that I, JOHN MCCLURE WHITE, a citizen of the United States of America, and a resident of Mapleton borough, county of Huntingdon, State of Pennsylvania, have invented certain new and useful Improvements in Driers, of which the following is a specification.

My invention relates to certain new and useful improvements in driers.

The form of drier to which my invention is particularly adapted is designed for the purpose of drying sand or similar material.

One of the chief difficulties which has been encountered in sand-driers as heretofore constructed has been that the material to be dried and the gases of combustion both passed too slowly through the chamber. As a result of this the material was exposed too long a time to the drying action, thus superheating the material and causing the waste of a large amount of the heat of the drying agent.

The object of my invention is to provide a structure in which the length of time required for the material to pass through the drier is decreased and the material broken up into small particles by suitable means. By so doing the heat of the drying agent is brought into contact with each separate particle, which is thus dried with the least possible waste of heat, passing then directly from the structure, thus preventng superheating.

With these objects in view my invention consists of certain constructions and improvements, the preferred form of which will be first described and then the invention particularly pointed out in the claims.

Referring to the drawings, wherein the same part is designated by the same reference-numeral wherever it occurs, Figure 1 is a longitudinal section of a drier made in accordance with the preferred form of my invention. Fig. 2 is a longitudinal section taken at right angles to Fig. 1. Fig. 3 is a sectional view similar to Fig. 1, showing, however, only the central portion of the drier. Fig. 4 is a detail perspective view showing the interior arrangemen of parts, the same being shown as removed from the stack.

1 designates a stack or chimney which is provided in its lower portion with a suitable grate 2, on which a fire may be maintained. The stack 1 is preferably and as shown provided for a part of its height with a lining 3, of fire-brick or the like.

4 and 5 are sets of screens which are preferably diagonally arranged and extend in opposite directions, the set of screens 5 being shown as supported on the top of the fire-brick section 3, with the section 4 supported on the section 5.

6 is a conical screen which rests upon the screen 4 and on top of which the sand or other material to be dried is dumped.

7 7 are a series of inclined plates, made, preferably, of metal, which are set in the fire-brick walls of the drier. These plates are of a width less than the width of the flue in the stack and extend out alternately from the walls—that is to say, one plate extends out from one wall and the next plate from the opposite wall. These plates are supported in position by means of the rods 8 8 or the like. At the upper end each plate is preferably provided with an upwardly-turned edge 9, the edge 9 extending up in front of the lower end of the plate immediately above the same, so as to catch the sand or other material passing down from the upper plate and divert it onto itself.

10 10 are a series of screens supported in the side wall and extending in front of the lower edge of each plate, preferably at right angles thereto, these screen-sections 10 10 being for the purpose of retarding the flow of sand from one plate to the next below. The plates, as has been before stated, do not extend clear across the flue, and between the free edge of each plate and the side of the flue I place a brick 11, preferably composed of fire-clay or the like, the brick being supported in position by means of the extensions 12 12 on the brick, which are embedded in the lining of the stack. This brick is L shape in cross-section and is provided with a flue 13, which is also L shape in cross-section and extends for substantially the length of the brick. The brick is placed in position in the flue so that the edge of the flue 7 rests in the angle of the L, with one of the sides of the L extending below the plate and the other extending over the plate and above the same. The flue 13 in the brick forms a passage-way by which the products of combustion can pass from below the plate up over the same and

across the top thereof. These bricks, as will be apparent, are on alternate sides of the chimney, and consequently the products of combustion will by passing through the flues of the bricks pass from one side of the stack to the other. It will be noticed that there is a space between the ends of the plates 7 7 and the sides of the stack. This is to permit part of the products of combustion to pass straight up the chimney without taking the serpentine course which is given the products of combustion passing through the flues of the bricks.

In the operation of my device a fire is built upon the grate 2, and when it is thoroughly started sand or like material to be dried is dumped in the top of the stack. The material passes through the screens 6, 4, and 5 and is thoroughly broken up by them. It then drops onto the upper one of the plates 7 7 and rolls down the same, striking the screen 10, when it passes off the end of the plate, and then passing onto the next plate 7, where it runs in a reversed direction. This continues until the material has passed over all the plates of the series, when it falls into a suitable delivery-chute 14, extending through the side of the stack and by means of which the material is delivered. Part of the products of combustion pass through the flues 13 of the bricks 11 and are caused to traverse a serpentine path through the drier, coming close to the top faces of the plates 7. Other parts of the products of combustion pass directly up through the stack by passing between the ends of the plates 7 and the side walls of the stack.

While I have described what I believe to be the preferred form of my invention, I desire to have it understood that many changes may be made in the form, construction, and arrangement of parts without departing from the spirit of my invention.

The reason why I prefer to have part of the products of combustion pass directly through the stack is to cause a sufficient draft to promote combustion on the grate and to have the gases sufficiently hot to be effective when they pass through the screens.

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

1. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates extending from alternate sides of the stack, the plates being narrower than the stack, whereby a space is left at alternate sides of the stack for the passage of the drying agent.

2. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates extending from alternate sides of the stack, the plates being narrower than the stack and a flue placed between one edge of the plate and the stack, whereby a passage is formed from below the plate to the upper side thereof.

3. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates extending from alternate sides of the stack, the plates being narrower than the stack, and a flue composed of an L-shaped brick having a passage extending from below the plate to the upper side thereof, located between the edges of the plates and the sides of the stack.

4. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates extending from alternate sides of the stack, the upper edge of each plate being upwardly turned to catch the material passing off the lower end of the plate immediately above.

5. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates and a screen extending across the lower edge of each plate to obstruct the passage of material to be dried through the drier.

6. A drier composed of a stack provided on its interior with a series of alternately-disposed inclined plates and a screen arranged at right angles at the lower edge of each plate to obstruct the passage of material to be dried through the drier.

7. A drier composed of a stack provided on its interior with a screen-section, a series of alternately-disposed inclined plates extending from alternate sides of the stack below the screen-section and a furnace below the inclined plates.

8. A drier composed of a stack provided on its interior with a set of screens in which the screen elements are diagonally arranged and parallel to each other, a second set of screens located above the first set in which the screening elements are similarly arranged in an opposite direction to the first set and a conical screen arranged over the sets of screens.

9. A drier composed of a stack provided on its interior with a set of diagonally-arranged screens, the screens being parallel to each other and a conical screen located over the diagonally-arranged screens.

10. A drier composed of a stack provided on its interior with two sets of diagonally-arranged screens, the screens of one set extending in an opposite direction from the screens of the other set, the screens of each set being parallel to each other.

Signed by me at Mapleton borough, Huntingdon county, Pennsylvania, this 2d day of March, 1906.

JOHN McCLURE WHITE.

Witnesses:
FRANK O'CONNOR,
R. S. HENDERSON.