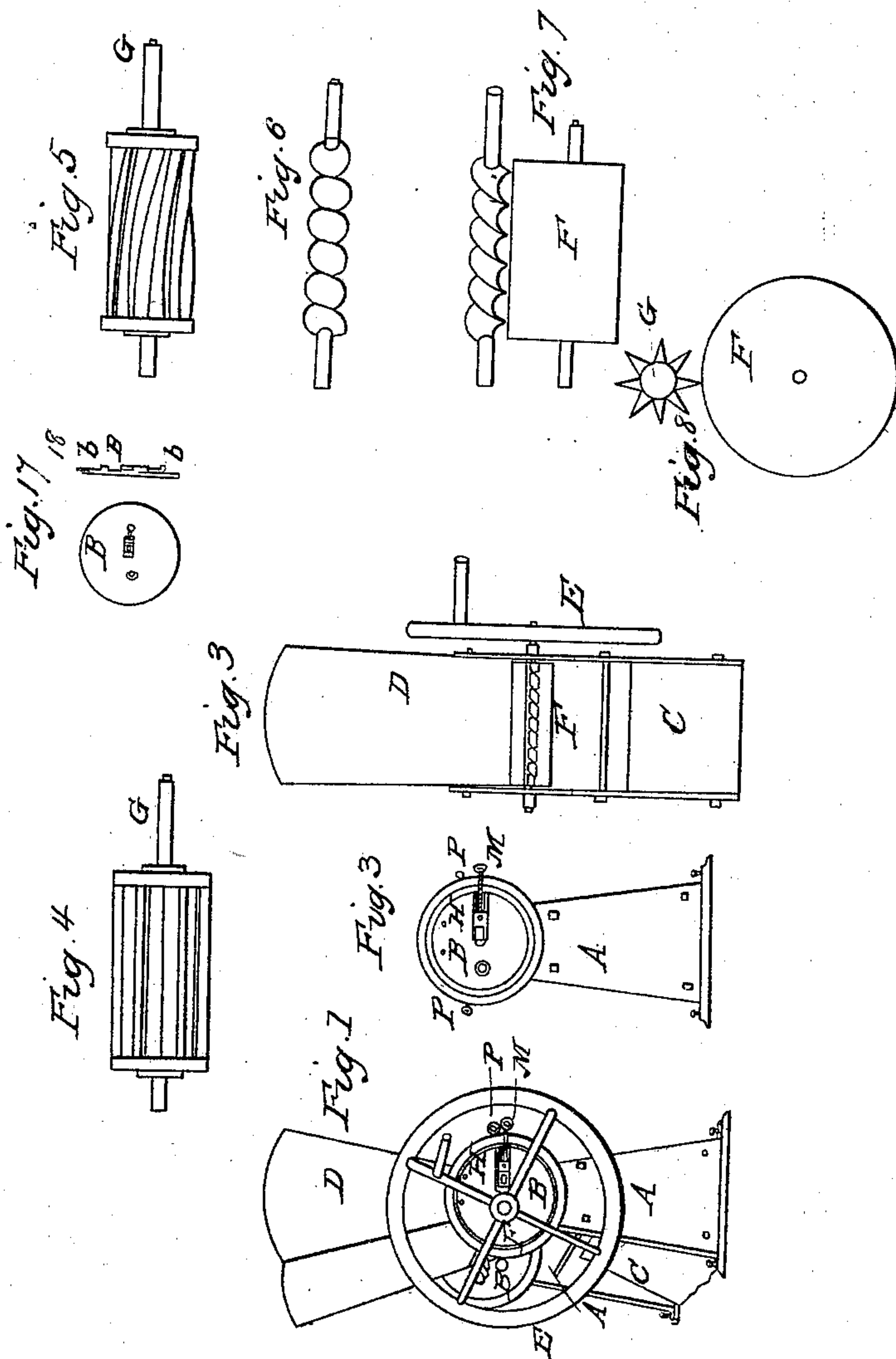


E. WARREN.
Straw Cutter.

No. 2,803.

Patented Oct. 7, 1842.



WITNESSES

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EDMUND WARREN, OF NEW YORK, N. Y.

STRAW-CUTTER.

Specification of Letters Patent No. 2,803, dated October 7, 1842.

To all whom it may concern:

Be it known that I, EDMUND WARREN, of the city, county, and State of New York, have invented a new and useful Hay and Straw Cutter; and I hereby declare that the following is a full and exact description.

It is called "Warren's hay and straw cutter."

The nature of it consists in twisting a two, three or four-edge knife to a slightly spiral form or auger shape or setting knives (edges out) spirally around a rod or shaft and these made to cut against a wooden roller or band, (as hereinafter described.) Its nature also consists in an arrangement by which the hopper can be turned down or up or at any angle.

To enable others to make and use my invention I proceed to describe its construction and operation, reference being had to the three sheets of drawings hereunto annexed and making part of this specification.

Pl. I.—Figure 1, perspective view of one of the forms of the machine; Fig. 2, the same—front view; Fig. 3, side view; Fig. 4, a shaft with straight cutters; Fig. 5, a shaft with spiral cutters; Fig. 6, a two-edged cutter twisted like an auger; Fig. 7, relative position of cutter and roller; Fig. 8, end of rollers and cutters Figs. 4 and 5. Pl. II.—Fig. 9, view enlarged of another form of the machine; Fig. 10, a three-edged cutter twisted and roller; Fig. 11, end of the same cutter; Fig. 12, four-edged cutter and roller; Fig. 13, cross section of the cutter. Pl. III.—Fig. 14, perspective view of machine—same form as Fig. 9 with the band attached; Fig. 15, view of the band or belt and rollers; Fig. 16, the same—edge view. Pl. I.—Fig. 17, the disk; Fig. 18, edge view of the same.

The same letters refer to the same things, relatively, in all the drawings.

A, side piece—generally made of cast iron. In the form of machine, Figs. 1, 2 and 3, it is cast separate from the disk.

B, the disk, which is circular and made to fit into the side piece above described and is secured in its place by screws (P Fig. 3) one on each side, that fix it in any position in which it may be placed.

C, division boards, Fig. 1. Two boards of

a square form placed between the sides, meeting at top, just beneath the rollers, and diverging at bottom. They form part of the frame work of the machine. They fit into a groove formed by flanches cast upon the sides.

D, the hopper, generally made of sheet iron.

E, the balance wheel on which is the crank.

F, the roller against which the knives cut, or around which the belt passes.

G, the shaft of cutters 4 and 5.

H, the slot for the journal-box, R, see Figs. 9 and 14 and 1. On Fig. 1 it is connected with the disk B and is of the same form and construction as that cast upon the side pieces A Figs. 9 and 14. This slot is about five inches long two wide and an inch and half deep—that is, standing out from the plate A. The journal-box it holds is made (either of wood or metal) to fit but is only about three inches in length. On the outside of the slot all around there is a lip to prevent the journal box R coming out. In the box R hangs the journal of the roller F. The thumb screw M is for pressing it nearer to the cutters.

I, staples or eyes (Figs. 9 and 14) set in the box or shelf K upon which the machine, (when made of the form of Fig. 9,) is secured. They are for holding the machine firmly in its place. When it is required to turn it down from the position shown in the drawing, in order that the hopper may lie horizontally, the rod at the corner marked in Figs. 9 and 14, Q is drawn out. The machine is turned down and the rod so withdrawn, put through the holes at the corner mark S and through the staples I at the end of the box, T. The rod L which crosses at the middle of the box is permanently fixed.

K, the box supporting the machine of any size or shape.

L, the rods which hold the machine in place.

M, the thumb screw (see Figs. 9 and 14) in the slot H for moving the journal box.

N, the belt or band. This is generally made of raw hide or leather, and is found by experiment to hold a firm and smooth

surface to cut upon longer than can be made in any other known way. It passes over a roller set in the top of the hopper as shown, Fig. 14, and passes down in the hopper and around the roller F and up on the outside to the top roller O. It must run tolerably tight upon the rollers and should be even and smooth.

O, the smaller roller at top of the hopper. It is placed on the right of the operator. The balance wheel and crank, in Figs. 9 and 14, are on the side of the machine opposite to that which is shown.

P, the small thumb screws (Figs. 1 and 3) for confining the disk B in place. They pass through the circular rim in which the disk is placed and reach the edge of the disk.

Q, one of the corners of the machine—whence the rod is drawn, to change the position of the machine.

R, the journal-box—an oblong square and made to fit into the slot H.

S, one of the upper corners of the machine (9 and 14).

T, end of the box.

U, the permanent journal-box. This is cast in the form of a solid knob upon the side piece A (Figs. 9 and 14) and drilled out to admit the journal of the cutters.

Form of machine.—The form I prefer is the square shape seen at Figs. 9 and 14. The side pieces A being cast square with the four edges hollowed out a little and with the slot H and the permanent box U cast upon it.

The other forms are almost superseded by this. The form shown at Figs. 1, 2, and 3, is cast with the sides each in two parts. A side piece is shown at Fig. 3. The disk B

(see also at 17 and 18) is made to fit into the circular rim of the top of the side piece A. The disk B has a slot H and permanent box U cast upon it the same as the square side pieces. It has a flanch *b* about half its

general thickness which fits into a circular rabbet in the rim and it is screwed fast in this position by means of the thumb screws

P. The use of this disk is to admit of turning down the hopper to any angle—which is done by loosening the screws P. To this

disk is firmly attached the hopper and the whole apparatus for cutting.

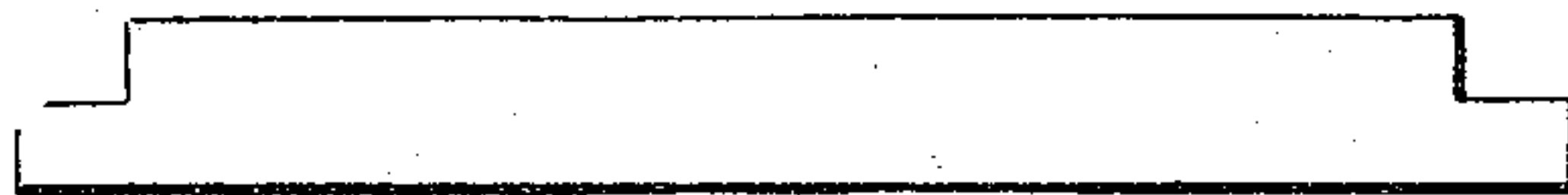
The roller with and without the belt.—The roller when used without the belt should be of hickory or other tough wood turned smooth—or it may be advantageously made by driving pins into a roller so as to fill the whole space and then turning it smooth.

When the belt is used it should be of hard wood or metal—that it need not be tough.

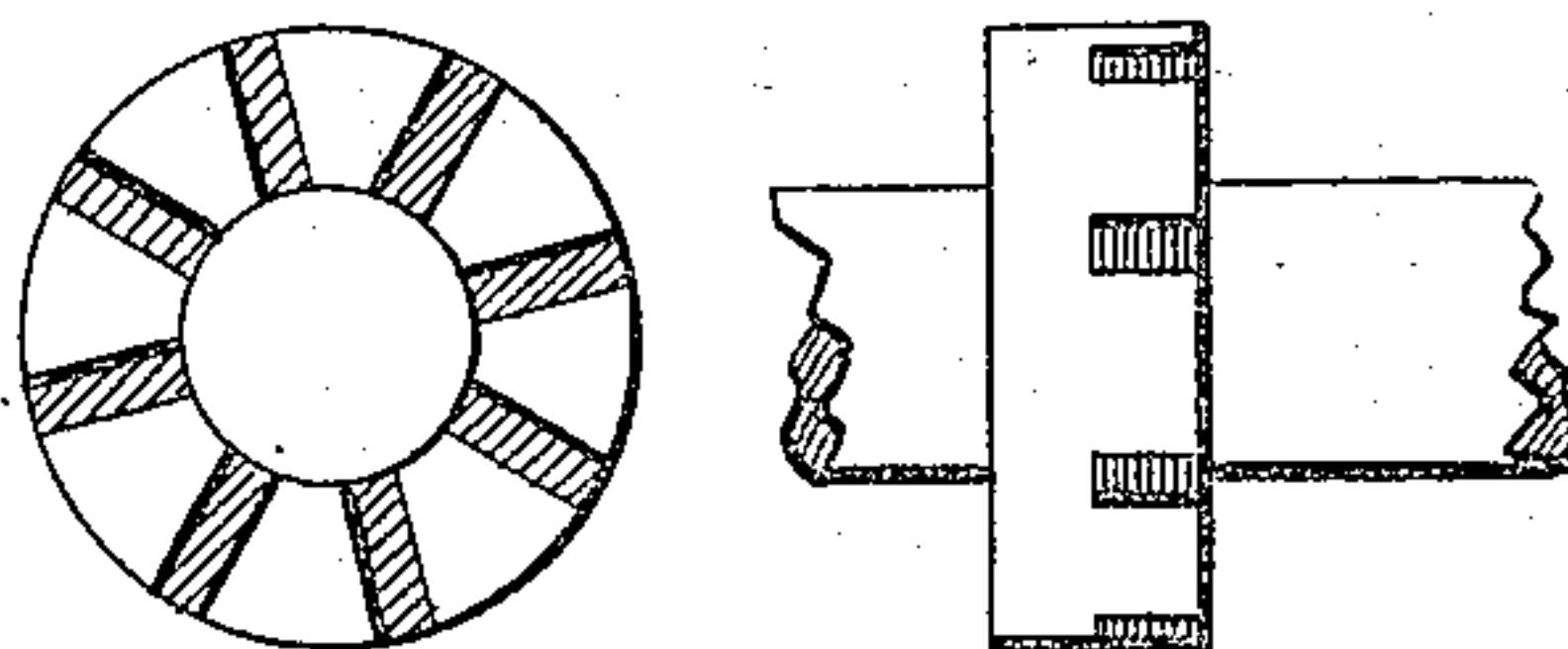
The belt should be of untanned hide (though leather will do) drawn tight over the two rollers F and O.

The cutters.—Of these I prefer the spiral principle. I have found that I can make a good machine with cast steel knives eight or

ten in number—about an inch in width, a quarter of an inch thick at the back and running to an edge. The backs are intended to cover all the space of the surface of the shaft on which they rest. They are about 8 inches long, entire, the cutting part of the edge shorter by an inch, thus:



When the knife is shaped it is slightly twisted. The collars of cast iron, shaped thus:



receive the ends of the knives and a ring is put on to hold them in place. See Figs. 5 and 8. But I have ascertained that the nearer the center I can put the cutting edge the better and I therefore prefer the knives with two, three or more edges made in one piece, as these admit of bringing the cutting edge very nigh the center. These are rolled out in the proper shape while hot and ground upon the edge of a thin grindstone—held at right angles to the shaft of the grindstone. One principle is to wind a knife spirally around a small shaft edge out. This is not shown—it not being now used. The other—that of making the cutter in one piece and twisted like an auger is best. The cutter is but slightly twisted—once around for the two-edged knife and less for those with more edges.

The cutters with three or four edges are probably the strongest—see cross section of them at 11 and 13. They are formed of the shape required without difficulty.

The balance wheel need not be heavy as it has been the practice to use in other machines where it was necessary to equalize the jumping motion.

The machine is operated by one person—a boy is fully capable. If straw is to be cut the hopper is placed upright and the straw put in with the left hand and the crank turned with the right—for hay the hopper is turned down to a horizontal position.

What I claim as my invention and desire to secure by Letters Patent is—

1. The revolving disk seen in the drawings at Figs. 1, 2, 3, 17, and 18 letter B, for the purpose of changing the position of the hopper.

2. The combination of the belt (N Figs. 14, 15 and 16) consisting of hide, leather or other suitable substance and the two rollers

F. and O Plate III, with the cutting knives, to form a good and durable surface for the knives to act upon.

- 5 3. The application of the spiral knives as set forth Fig. 5—their backs set to a small round shaft, or instead one blade wound evenly around a shaft in a long spiral and secured at each end with a ring and collar.
- 10 4. I claim the application to straw cut-

ters of the spiral cutters, Figs. 6, 7, 10, 11, 12 and 13 made of one piece and with two, three, four or more edges.

Given under my hand this fourth day of July 1842.

EDMUND WARREN.

In presence of—

OWEN G. WARREN,
JOHN WARREN.