(No Model.) 2 Sheets—Sheet 1.

J. D. BANGERT.

MACHINE FOR MIXING AND AERATING FLOUR.

No. 274,697. Patented Mar. 27, 1883.

FIG I.

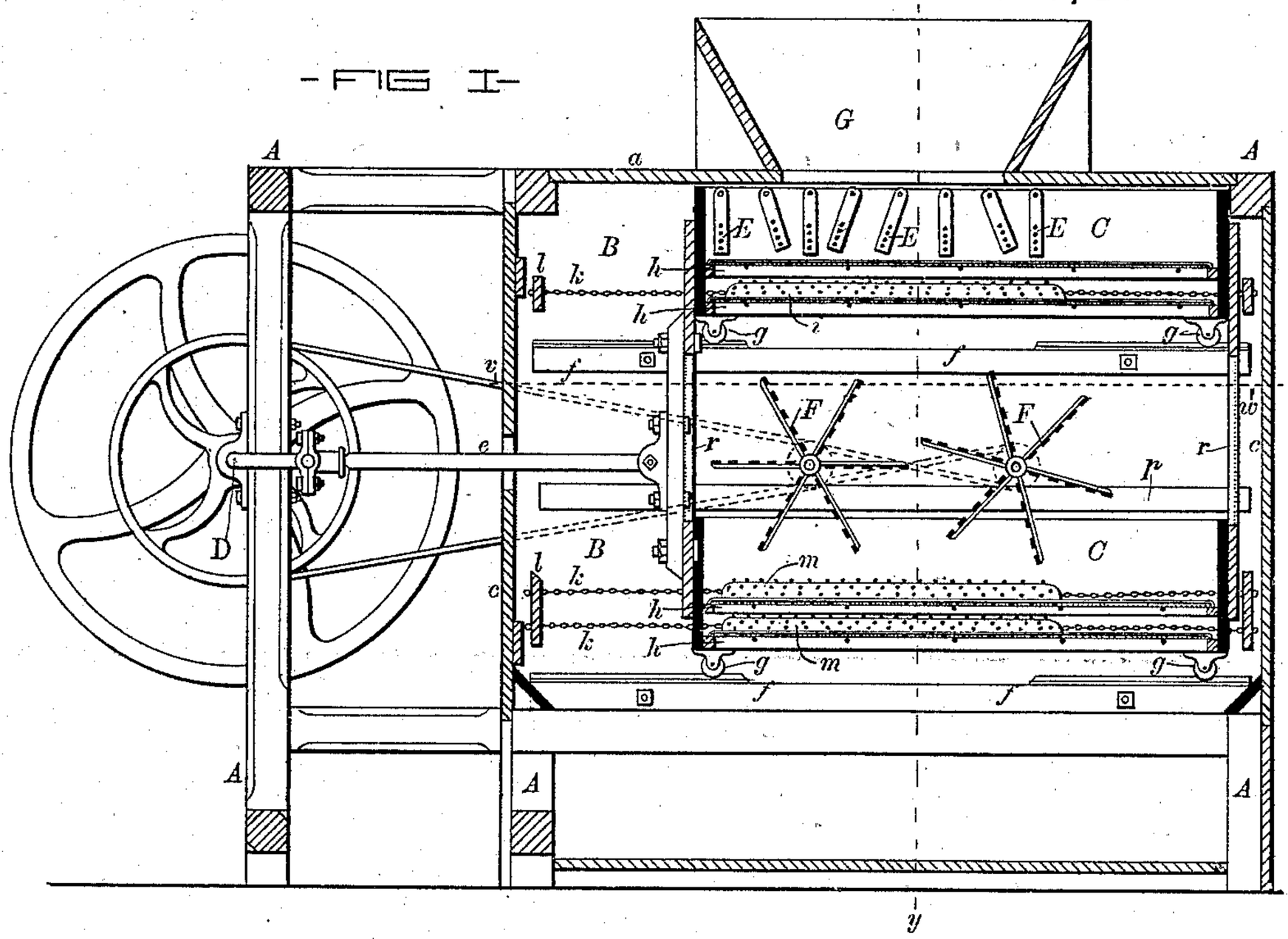
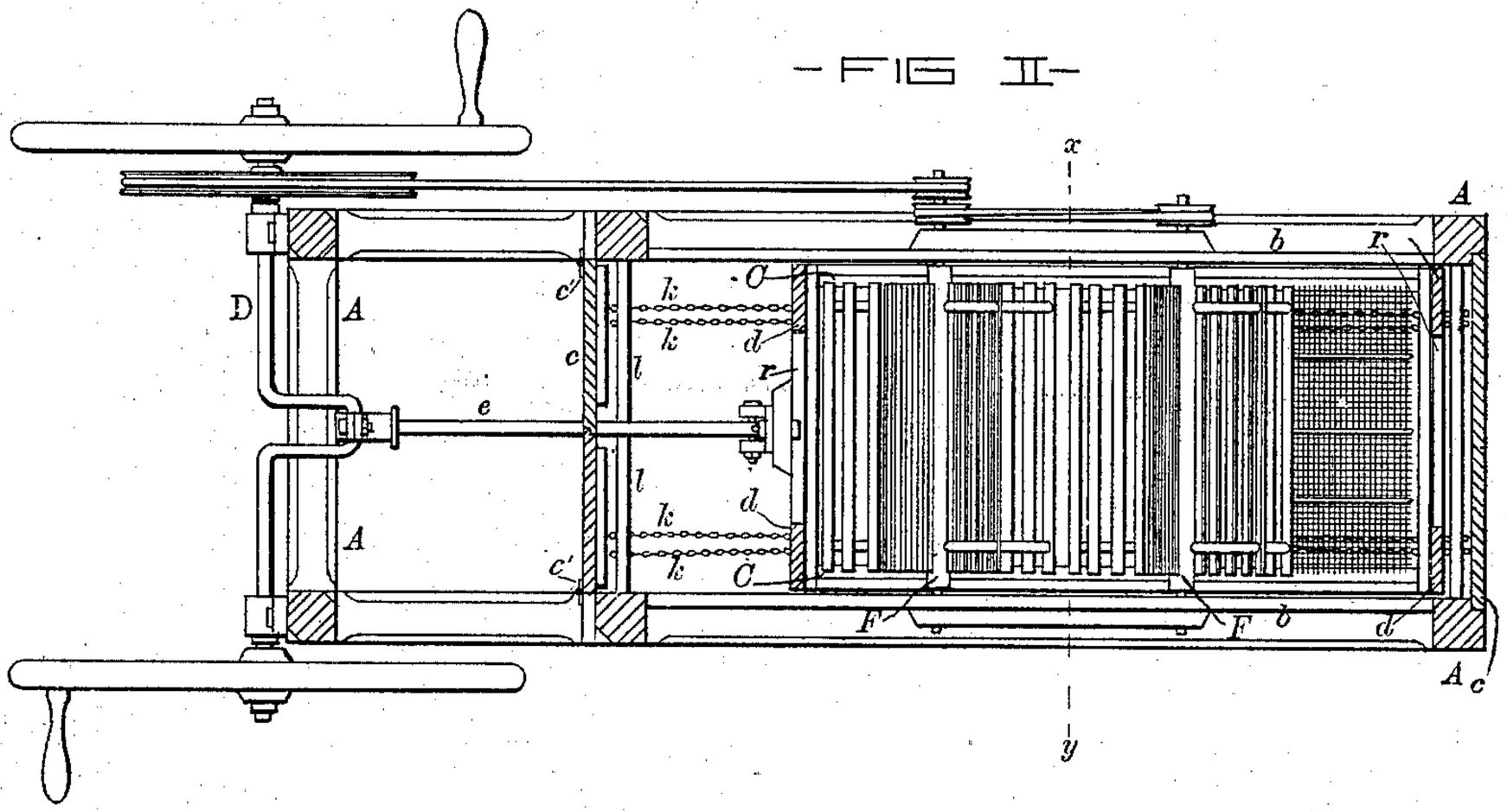


FIG II.



WITNESSES

Karl Fisher

Chas. B. Cassady.

INVENTOR

John D. Bangert,

by G. H. W. J. Howard,

attys.

(No Model.) 2 Sheets—Sheet 2.

J. D. BANGERT.

MACHINE FOR MIXING AND AERATING FLOUR.

No. 274,697. Patented Mar. 27, 1883.

FIG III

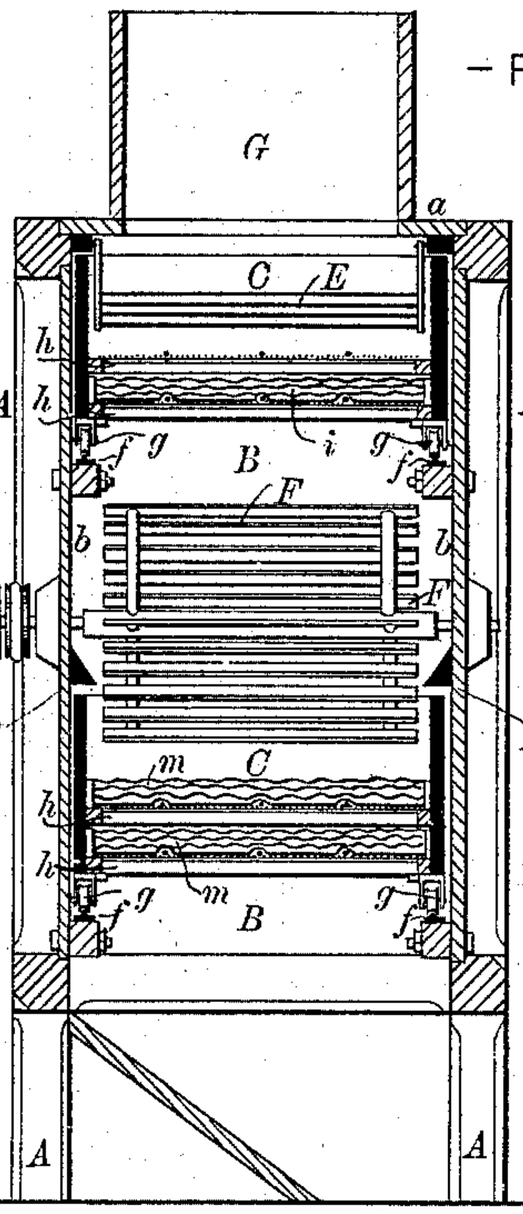


FIG IV

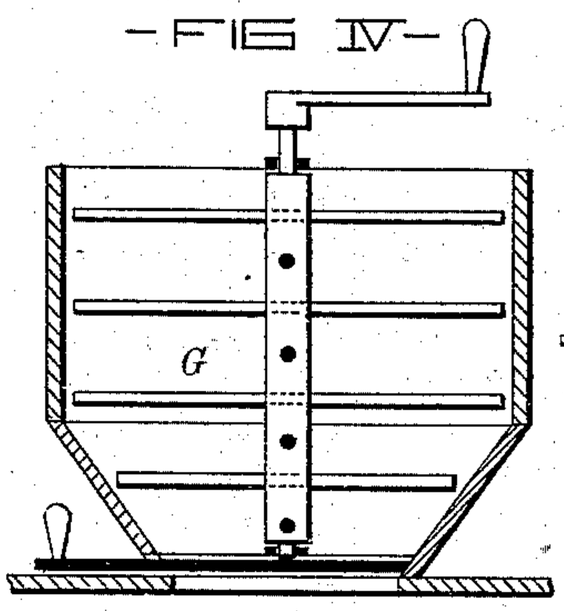


FIG V

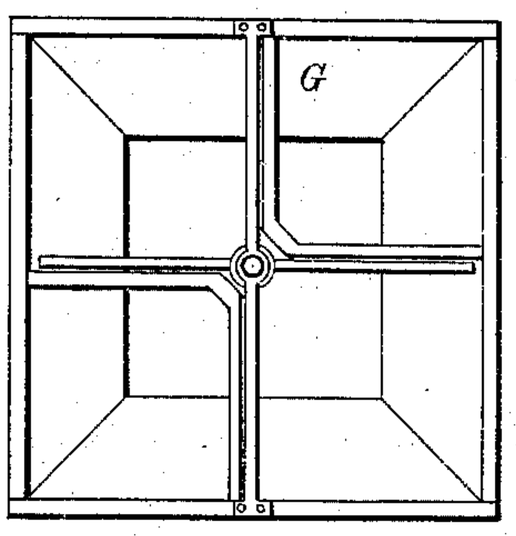


FIG VI

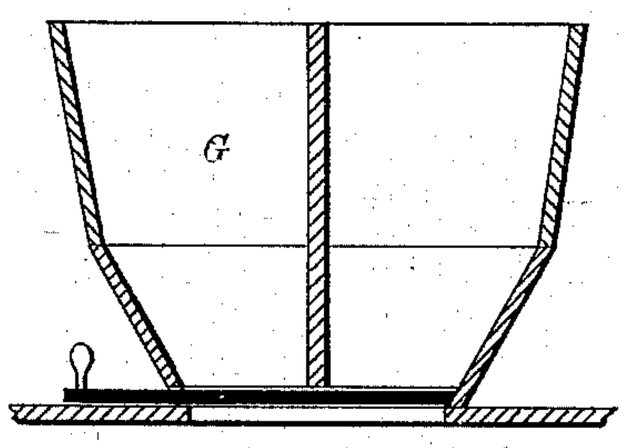
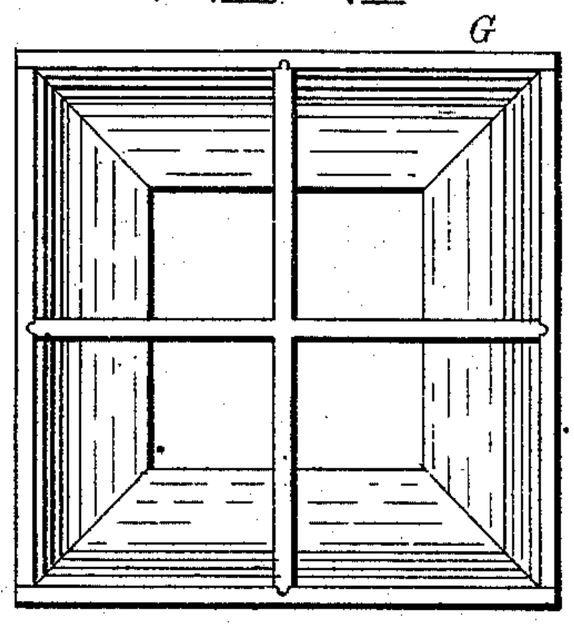


FIG VII



WITNESSES

Danl. Fisher

Chas. B. Cassady

INVENTOR

John D. Bangert,

by Gifford Howard,

Attys.

UNITED STATES PATENT OFFICE.

JOHN D. BANGERT, OF BALTIMORE, MARYLAND.

MACHINE FOR MIXING AND AERATING FLOUR.

SPECIFICATION forming part of Letters Patent No. 274,697, dated March 27, 1883.

Application filed September 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. BANGERT, of the city of Baltimore, and State of Maryland, have invented certain Improvements in Machines for Mixing and Aerating Flour, of which the following is a specification.

This invention relates to a machine for mixing flour of different grades and values and reducing the same to a uniform brand; also, for aerating the flour during the sifting and mixing processes to arrest and prevent fermentation and heating.

In the description of my invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure I is a longitudinal section of the improved machine. Fig. II is a sectional plan of the same, taken on the dotted line *v w*, Fig. I. Fig. III is a transverse section taken on the dotted line *x y*, Figs. I and II. Figs. IV, V, VI, and VII are views of parts of the invention on an enlarged scale, as hereinafter fully described.

Similar letters of reference indicate similar parts in all the views.

A is the frame of the machine, a part of which is provided with a top and sides, respectively represented by *a* and *b*, and doors *c*, having hinges *c'*, to form a chamber, B.

C C are trays connected together at the ends by boards *d*, situated within the chamber B and adapted to have a reciprocating longitudinal movement, derived from the crank-shaft D through the medium of a connecting-rod, *e*, one end of which is pivoted to the forward end of the trays. The trays C are supported within the chamber B by means of tracks *f*, fastened to the sides of the chamber, and sheaves *g*, secured to the under side of the trays. (See Figs. I and II.) The trays are each provided with sieves *h*, and between the upper sieves is a mixer, *i*. The mixer *i* rests on the under sieve of the upper tray, and is connected to the wall of the chamber B by means of chains *k* and cross-pieces *l*. These chains pass loosely through the ends of the tray. Consequently the said mixer is held stationary during the reciprocating movement of the tray and sieves. The lower sieves are each provided with a mixer, *m*, which rests thereon. The mixers *i* and *m* herein shown consist of a series of transverse corrugated rods or wires united at their ends by longitudinal strips, (see Fig. III;) but I do not confine myself to this exact construction.

E E are breakers, consisting of pendent pivoted bars connected by rods, (see Fig. III,) and they have preferably an irregular vibratory movement in the longitudinal motion of the trays. They may, however, be connected at their lower ends by a chain or rod to give them a regular swinging movement.

F F are aerating-fans situated between the trays, which are revolved in opposite directions from the crank-shaft by means of a system of pulleys and belts, which in themselves are of common construction.

The machine is shown in the drawings as adapted for operation by hand-power, it being provided with crank-wheels; but it may be driven by steam-power, if desired.

Parts of the machine not yet alluded to will be described and their uses fully set forth in the description of the operation of the machine, which follows.

The machine being placed in operation, the flour to be mixed and aerated is placed in a hopper, G, located over the breakers E. In Fig. I the hopper is shown as a plain box; but I prefer to use a hopper divided into sections, so as to isolate the different kinds of flour placed therein, and provided with a sliding gate underneath, to prevent the admission of the stored flour to the breakers until such time as the various sections of the hopper are filled. (See Figs. VI and VII.) In Figs. IV and V the partitions in the hopper are shown as removable, in order to allow of the revolution of a paddle. This primary mixing, which is done previous to opening the gate leading to the breakers of the machine, is necessary in some cases where the different kinds of flour to be united have not been packed to the same density. After the gate is opened the flour falls to the top sieve in the upper tray, and is carried backward and forward on the same and brought in contact with the breakers E, which serve to reduce the lumps. As the flour passes from the top to the bottom sieve in the upper tray it is operated upon by the mixer *i*, which is stationary, and after passing through the said bot-

tom sieve is caught by the fans F F, which aerate it and reduce the temperature of the flour if the same has become heated. The flour next passes the lower set of mixers and sieves, and finally falls to the floor or to barrels, as may be arranged. If the flour is collected on the floor, a removable screen or frame covered with canvas is placed exteriorly of the machine to prevent the flour being scattered and lost. As the trays do not come in close contact with the inner sides of the chamber A, I place above the edges of the lower tray deflecting-strips *p*, which prevent the escape of the flour after it is thrown up by the fans F. To prevent the compression and expansion of air in the chamber B forward and in the rear of the trays, caused by the latter's reciprocating movement, I form apertures *r* in the boards *d*, and cover them with wire cloth of such mesh as will admit of the passage of air through it and yet intercept the flour.

In the drawings I have shown the tracks *f* as formed of smooth pieces of iron; but if a shaking motion of the trays, in addition to the reciprocating one, is desired, the upper surface of the rails forming the track can be corrugated.

While I prefer longitudinally-reciprocating sieves, combined with fixed or stationary mixers, this arrangement may be reversed without deviating from the spirit of the invention, which aims to enforce the sifting and mixing of the flour.

I claim as my invention—

1. A machine for mixing and aerating flour, having the following essential elements in combination, viz: a practically-closed chamber, means for introducing flour thereto, a series of longitudinally-reciprocating trays having sieves therein, a system of mixers which rest on the said sieves and are provided with chains or links to prevent their having movement in common with the said sieves, and means for effecting the said longitudinal reciprocating movement of the said sieves, substantially as specified.

2. In a machine for mixing and aerating flour, a longitudinally moving and reciprocating sieve, having a stationary or fixed mixing device resting thereon, and a series of revoluble fans located underneath the said sieve and mixer, the whole being combined within a practically-closed chamber having means for the introduction for unmixed flour thereto and an exit-aperture for the mixed and aerated flour, substantially as specified.

JOHN D. BANGERT.

Witnesses:
WM. T. HOWARD,
ED. J. DIGGS.