No. 760,417. PATENTED MAY 24, 1904.

W. H. BUDD, JR.

MACHINE FOR SEPARATING AND ASSEMBLING CRACKERS.

APPLICATION FILED AUG. 10, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

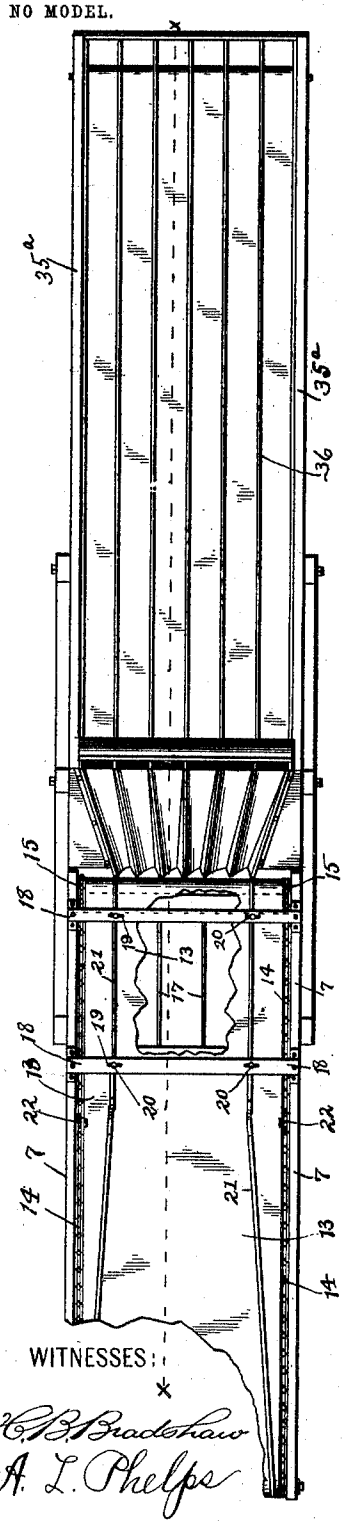

Fig. 2.

Fig. 3.

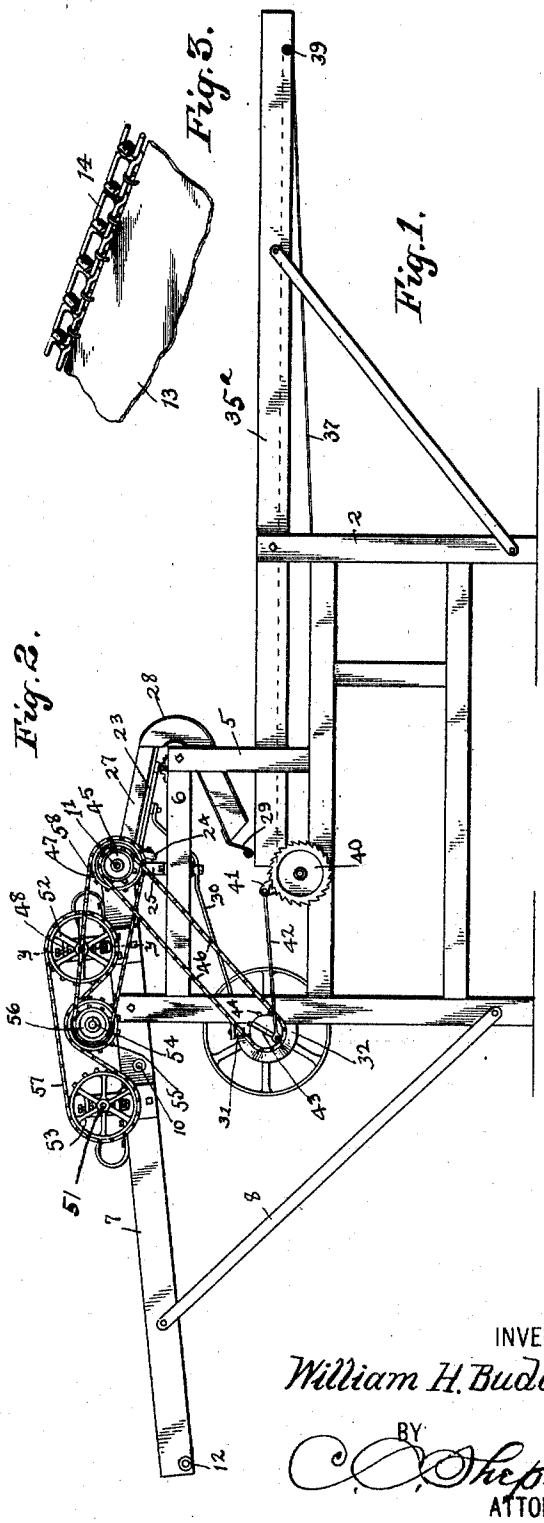

Fig. 1.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 6.

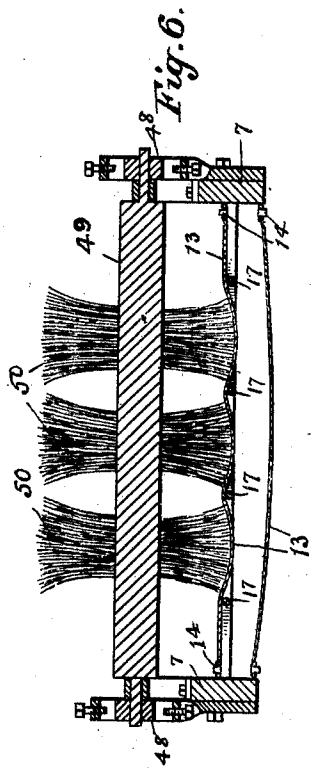
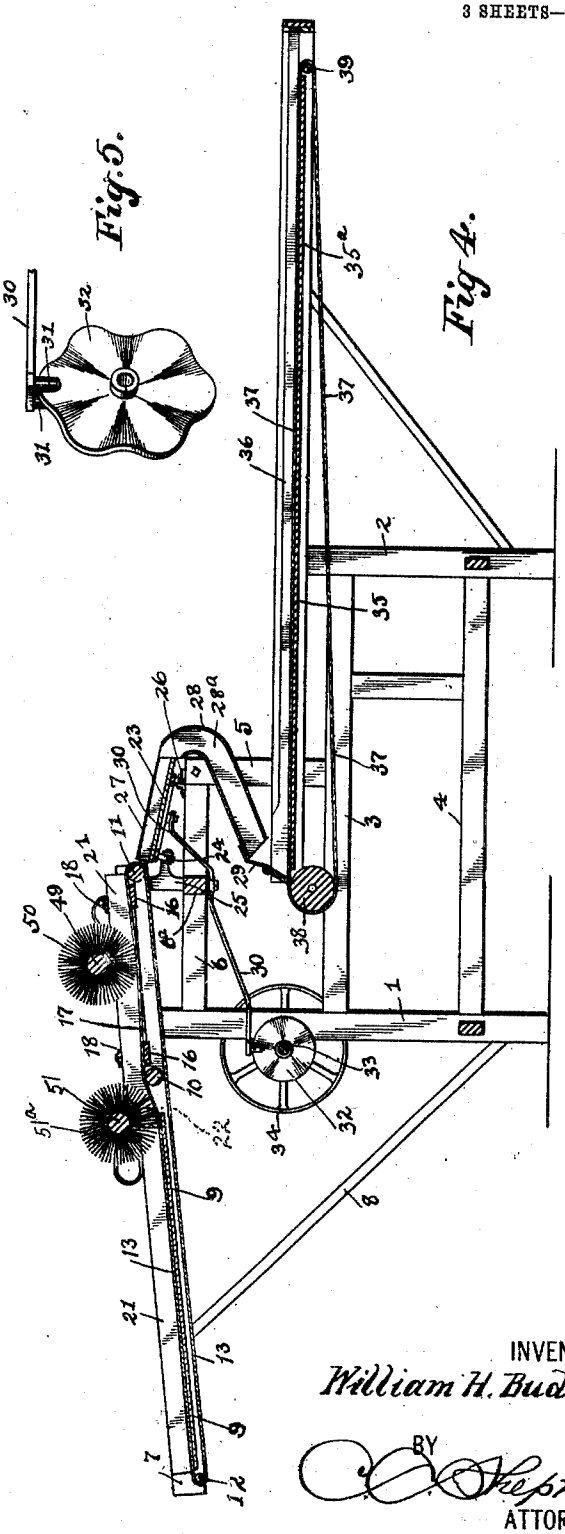


Fig. 5.

Fig. 4.



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NO MODEL. 3 SHEETS—SHEET 3.

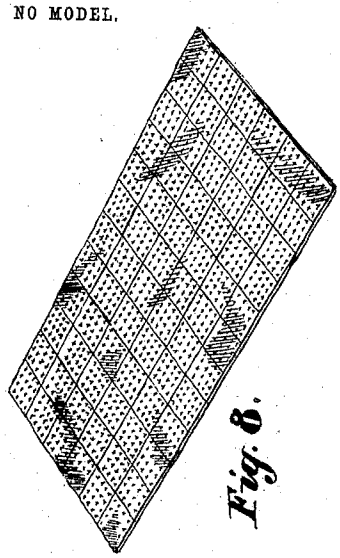

Fig. 6.

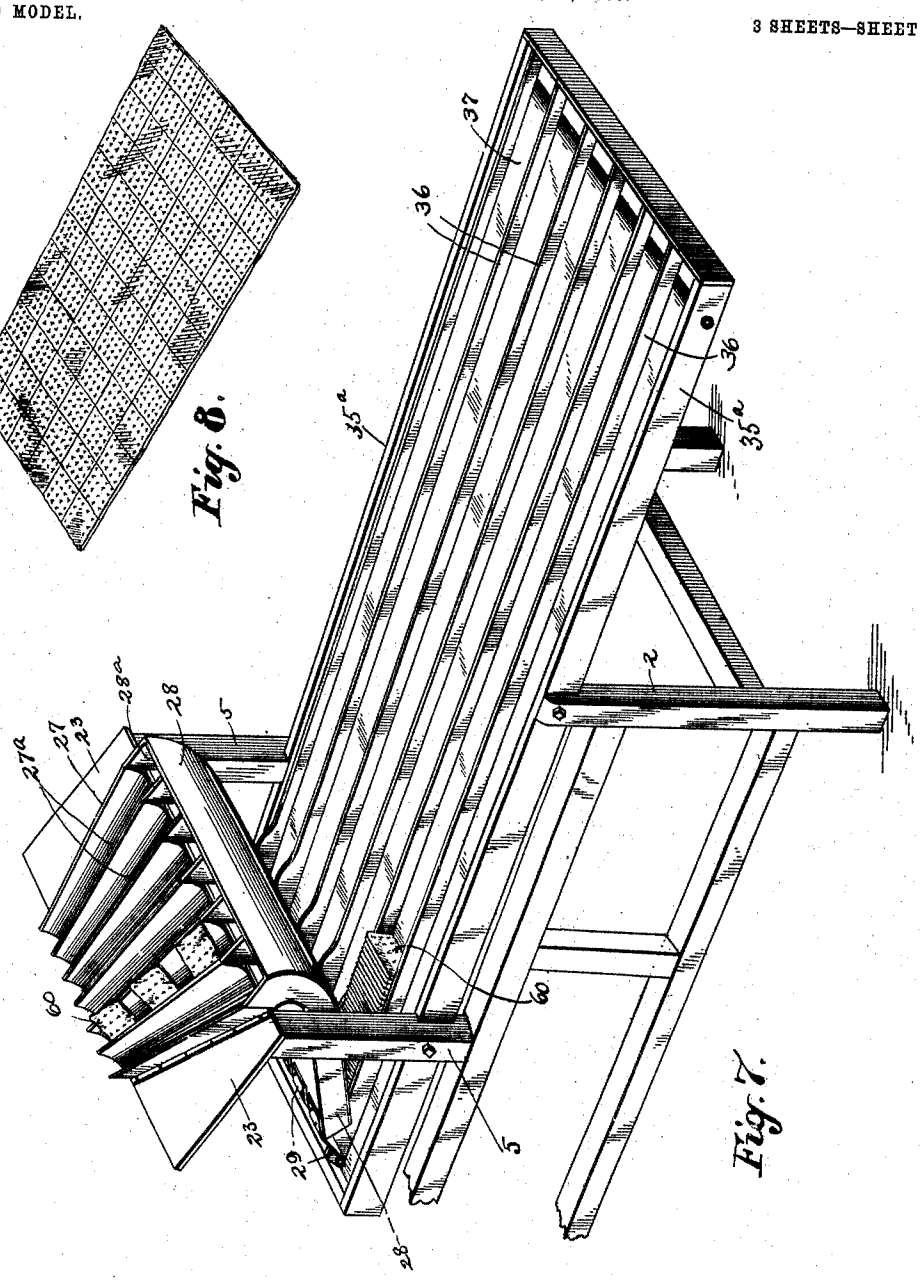

Fig. 7.

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No. 760,417. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

WILLIAM H. BUDD, JR., OF COLUMBUS, OHIO.

MACHINE FOR SEPARATING AND ASSEMBLING CRACKERS.

SPECIFICATION forming part of Letters Patent No. 760,417, dated May 24, 1904.

Application filed August 10, 1903. Serial No. 169,052. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BUDD, Jr., a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Machines for Separating and Assembling Crackers, of which the following is a specification.

My invention relates to the improvement of cracker stackers or assembling machines, and has particular relation to mechanism for assembling what are known as "square" crackers.

The objects of my invention are to provide a machine embodying improved means for separating a sheet of connected square crackers into sections and collecting or assembling the same in such relative positions as to permit of their being readily and conveniently packed and to produce certain improvements in details of construction and arrangement of parts, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a plan view of the greater portion of the same, omitting for the sake of clearness in illustration the gearing and the breaker-brushes and their rolls. Fig. 3 is a detail view in perspective of a portion of one of the conveying-aprons employed on the feed portion of the machine. Fig. 4 is a longitudinal section of the machine on line $x\,x$ of Fig. 2. Fig. 5 is a detail view in perspective of a cam employed in the manner hereinafter described. Fig. 6 is an enlarged transverse section on line $y\,y$ of Fig. 1, omitting the gearing. Fig. 7 is a view in perspective of the receiving or delivery portion of the machine; and Fig. 8 is a detail view in perspective of one of the sheets of crackers, showing the same prior to the breaking of the same into sections in the manner hereinafter described.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a suitable supporting-framework comprising pairs of opposing uprights 1 and 2 and intermediate horizontal frame-bars 3 and 4. The rear frame-standards 1 are, as shown, of greater height than the forward frame-standards 2, and between these forward and rear standards are arranged opposing standards 5, the upper ends of which are connected with the upper portions of the standards 1 by horizontal bars 6. This frame construction, however, may be varied as desired.

7 represents the parallel side bars of a feed-frame, said side bars being connected with and supported from the upper ends of the standards 1 and further supported by inclined brace-bars 8, running from the outer portions of said feed-frame side bars to the lower portions of said standards 1. In their lower portions the side bars 7 are connected by a transverse plate 9, the forward termination of which is in rear of the standards 1. In front of the forward end of the plate 9 is journaled between the side bars 7 a roller 10, and a similar roller 11 is journaled between the forward ends of said side bars. At the rear end of the feed-frame is journaled a transverse roller 12, and over the rollers 10, 11, and 12 runs an endless apron or belt 13. As indicated more clearly in Fig. 3 of the drawings, the belt or apron 13 has each of its longer edges connected with an endless sprocket chain or belt, the latter being indicated at 14 and adapted, as shown, to run within the feed-frame adjacent to the side bars thereof. These endless chains run over sprocket-wheels 15, carried on opposite ends of the roll 11. In the forward portion of the feed-frame the side bars 7 are connected by transverse bars 16, the latter, as well as the rolls 10 and 11, being upon a somewhat higher plane than the partition or plate 9. These bars 16 are connected by longitudinally-arranged parallel rods 17, over which the apron 13 travels. The upper sides of the frame side bars 7 are connected in the forward portions thereof by transverse bars 18, the latter having formed near each of their ends longitudinal slots 19, through which slots pass adjustable bolts or pins 20. These bolts or pins engage guide-bars 21, which are arranged longitudinally between the side frame-bars 7 and above the apron 13. As indicated in Fig. 2 of the drawings and also by dotted

lines in Fig. 4, I pivot to the inner side of each of the side bars 7 at a point above the forward end of the partition-plate 9 a small sprocket-wheel 22, beneath and in engagement with which run the sprocket-chains 14. These wheels 22 serve to retain the apron 13 in a depressed position above the plate 9 and below the roller 10 for the purpose hereinafter described.

In front of and inclined downward from the forward end of the feed-frame is a cracker-distributer consisting of a transversely-arranged base-board 23, which has its rear and higher end portion bearing upon a supporting-wheel 24, which is preferably carried from an arm or standard 25 rising from a cross frame-piece 6^a. The lower and forward end of the distributer base-board bears upon a suitable pivoted wheel 26. The upper side of the board 23 has mounted thereon a grooved or channeled distributing-body 27, the channels of which converge toward their upper ends.

Mounted between the upper portions of the standards 5 is the upturned rearwardly-curved head of a cracker discharging or conductor body 28, the latter inclining downwardly and rearwardly from its head portion and consisting of a casing or box-like body having parallel conduits 28^a, the upper open portions of which are adapted, respectively, to communicate with the lower ends of the channels 27^a of the distributing-body 27. As indicated in the drawings, the discharging-body 28 has secured to its lower end portion and upper side a number of downwardly-extending spring-strips 29, one extending opposite each of the conduits 28^a.

The distributing base-board 23 has pivotally connected with its under side a rod 30, which in its forward portion is fulcrumed to the under side of the frame-bar 6^a and which at its rear end carries a pair of downwardly-projecting rollers 31. These rollers loosely embrace the marginal portion of a cam-disk 32, carried on a suitably-journaled transverse power-shaft 33, said power-shaft also carrying a belt or driving wheel 34. As indicated more clearly in Fig. 5 of the drawings, the cam-disk 32 is provided with a radially-fluted surface.

Supported from the forward portion of the machine and extending forwardly therefrom is a cracker-receiver frame comprising parallel side bars 35^a and an intervening longitudinally-arranged partition-plate 35. Through the medium of parallel longitudinal strips 36 the receiving-frame is divided above the partition-plate 35 with longitudinal channels, one for each of the conduits 28^a. Running above and below the partition 35 of the delivery-frame is an endless belt or apron 37, the latter running over front and rear pivoted rolls 38 and 39. The roll 38 carries on one of its outer ends a ratchet-wheel 40, with the teeth of which engages a pawl 41, which is pivotally connected with a pawl-operating rod 42, the rear end of which is pivoted eccentrically to a disk 43, carried on the power-shaft 33. This power-shaft also carries a sprocket-wheel 44. On the outer end of the roller 11 is carried a sprocket-wheel 45, which is connected with the sprocket-wheel 44 by a chain belt 46. The spindle or outer end portion of the roll 11 also carries a sprocket-wheel 47.

Journaled in suitable bearings 48, which rise from the forward portions of the side bars 7 of the feed-frame, are the spindle-like ends of a transverse brush-carrying shaft 49, this shaft being indicated more clearly in Fig. 6 of the drawings, and, as shown in said figure, the shaft is provided at intervals with circular brushes 50, these brushes being of such circumference and arrangement as to bear against the apron 13 and depress the latter, as shown in Fig. 6, between the rods 17. In rear of the roll 10 and above the forward end of the partition 9 I journal the shaft 51 of a brush 51^a, corresponding in construction with the brush 50, and on the brush-shafts 49 and 51 are carried, respectively, sprocket-wheels 52 and 53. Between these sprocket-wheels is pivotally mounted from one of the side bars of the feed-frame a shaft 54, on which are carried inner and outer sprocket-wheels 55 and 56.

57 represents an endless chain belt which runs over and connects the sprocket-wheels 52 and 53 and also runs upon the inner sprocket-wheel 55. The sprocket-wheels 47 and 56 are connected by a chain belt 58.

In operation rotary motion is imparted to the power-shaft through a belt running over the wheel 34, and through the chain belts 46, 58, and 57 rotary motion is imparted to the shaft 11 and the brush-rolls 49 and 51. At each revolution of the cam-disk 32 it is obvious that the ratchet-wheel 40, and consequently the roll 38, will have imparted thereto a partial revolution. The square crackers, which come from the oven in sheets, such as indicated in Fig. 8 of the drawings, are fed onto the forwardly-moving belt or apron 13, and when carried by said apron to a point beneath the brush 51 said brush will exert such pressure on said sheet of crackers as to break the latter into transverse rows. When the strips of united crackers thus formed are subjected to the pressure of the brushes 50, it is obvious that the same will be broken apart on their adjoining lines by the pressure of said brushes 50. The crackers thus separated are carried forward by the belt 13 and delivered into the channels of the distributer-body 27. This distributer-body is subjected to a slight lateral vibration, imparted by the contact of the cam-disk 32 with the rollers 31 of the rod 30, such vibration tending to insure the feeding of the crackers into the conduits of the discharging-body 28, from which

the crackers are delivered into the channels of the delivery-frame. In dropping into said delivery-frame channels it will be understood that the crackers fall one upon the other, and at each movement imparted to the apron 37 as heretofore described said crackers will be carried toward the forward end of the delivery-frame, and when a sufficient number of the crackers have accumulated within the channels they may readily be straightened and collected and removed in stacks for packing. In Fig. 7 of the drawings I have shown the crackers, which are indicated at 60 in the positions which the same assume after being straightened up by hand and ready for removal. It will be understood that the first breaking of the cracker sheet described will be facilitated by the fact that the sheet is directed upward on an incline from the forward end of the partition 9 to the roller 10, the transverse break in the sheet occurring at the point where the same begins its upward movement.

From the construction and operation which I have described it will be understood that a comparatively simple, reliable, and effective mechanism is provided whereby the cracker "sheet" is separated into sections or crackers of the desired size and whereby such crackers are distributed into receiving-channels in position for readily being removed in a stacked condition.

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

1. In a cracker separating and assembling machine, the combination with a supporting-framework, a feed-frame mounted thereon, of an endless traveling apron in said feed-frame, brush-carrying rolls journaled one in rear of the other in said feed-frame and means for insuring a contact of the front and the rear brush, a delivery-frame and means for distributing the crackers on said frame in rows.

2. In a cracker separating and assembling machine, the combination with a supporting-framework, a feed-frame mounted thereon, and an endless belt running through said feed-frame, of brush-carrying rolls journaled in said frame and means for imparting rotary movement to said brushes and a traveling movement to said apron, rods 17 arranged longitudinally within the forward portion of the feed-frame and between the upper and lower lines of the endless apron, substantially as specified.

3. In a machine for separating and assembling crackers, the combination with a supporting-frame, a feed-frame mounted thereon, an endless apron in said feed-frame and means for imparting a traveling motion thereto, of a distributing-body arranged in front of said feed-frame and means for imparting a lateral vibratory motion thereto, a discharging-body communicating with said distributing-body and having separated conduits, a delivery-frame arranged below said discharging-body, an endless apron running through said delivery-frame and means for imparting an intermittent traveling motion thereto and longitudinally-arranged parallel bars separating said delivery-frame above said endless apron into channels.

4. In a cracker separating and assembling machine, the combination with a supporting-framework, a feed-frame mounted thereon, rolls in opposite ends of said feed-frame and sprocket-wheels carried on one of said rolls, of an endless traveling apron running over said rolls and a chain belt attached to each edge of said apron and engaging said sprocket-wheels and a cracker-distributing device to which said apron leads.

5. In a cracker separating and assembling machine, the combination with a supporting-framework, a feed-frame mounted thereon, rolls journaled in said feed-frame and sprocket-wheels carried on one or more of said rolls, of an endless apron running over said rolls, an endless sprocket-chain on each edge of said apron and rotary brushes mounted above said apron and adapted to depress the latter by contact therewith, substantially as specified.

WILLIAM H. BUDD, JR.

In presence of—
C. C. SHEPHERD,
CLIFTON C. EVANS.