

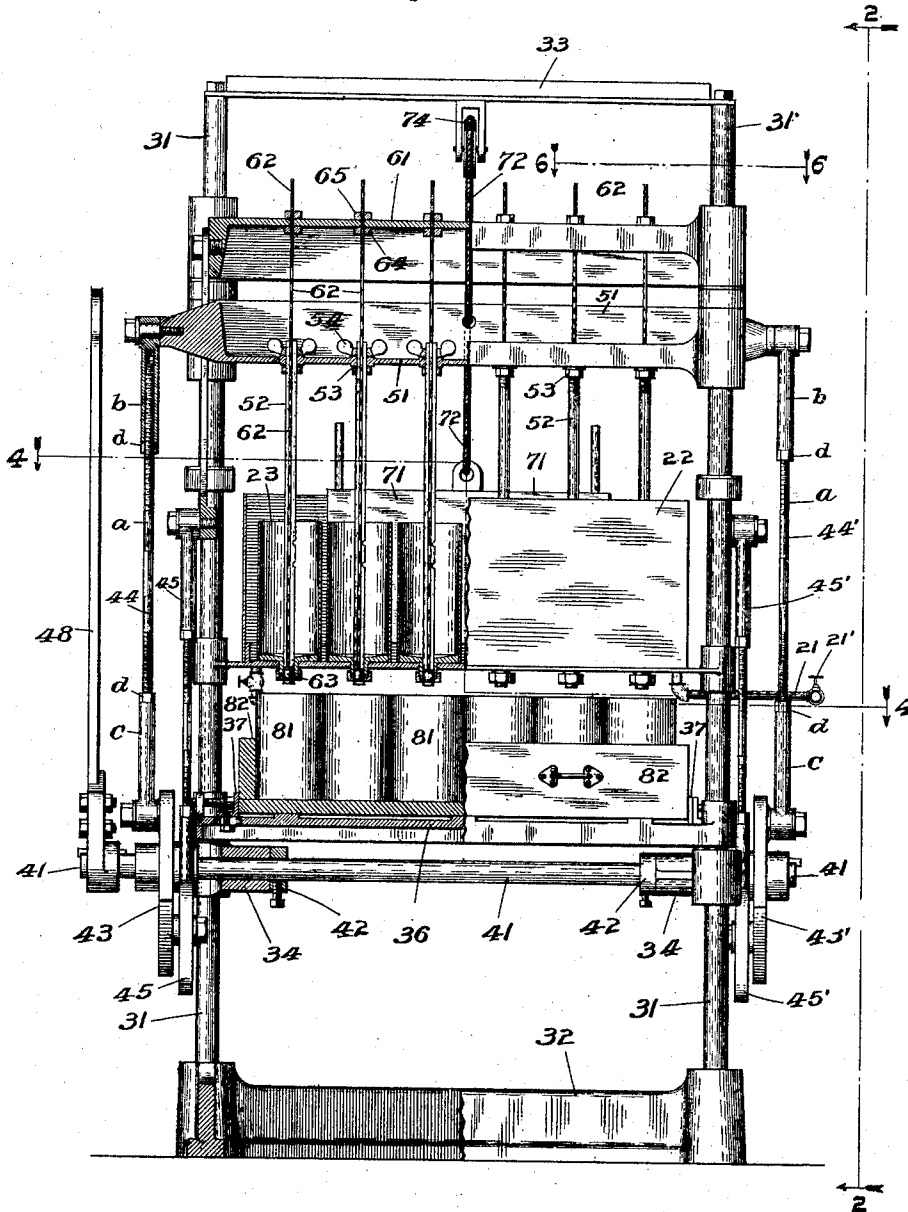
E. K. HOOD.
 RECEPTACLE FILLING MACHINE.
 APPLICATION FILED DEC. 26, 1906.

964,781.

Patented July 19, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses
 Frank A. Fahl
 Thomas W. McMeane

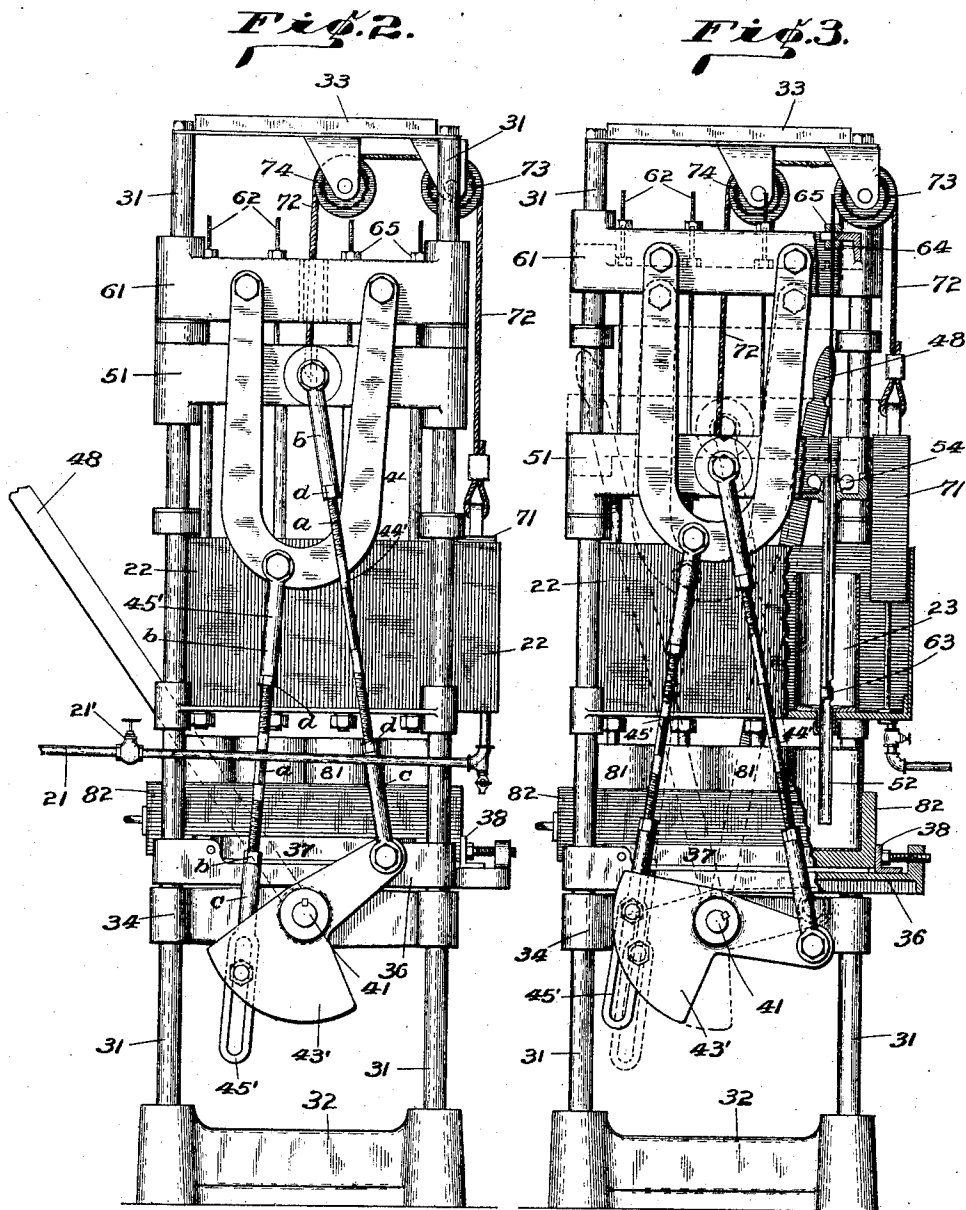
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3 SHEETS—SHEET 3.

Fig. 4.

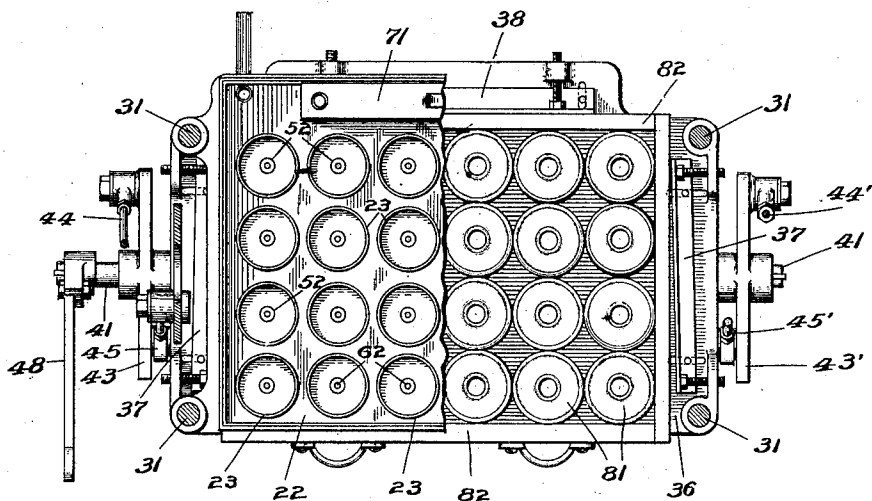
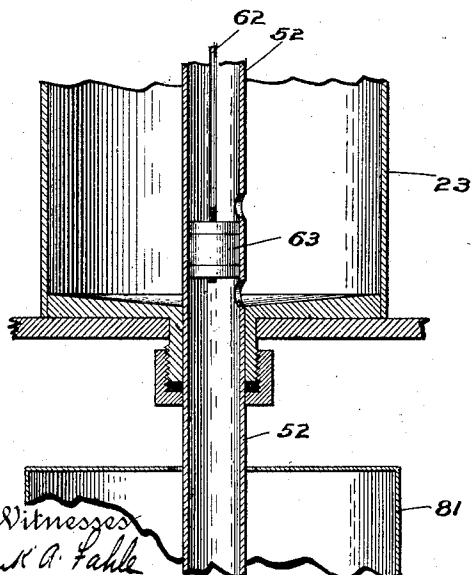
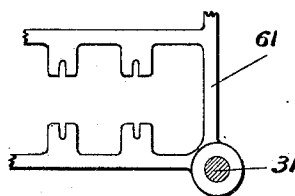


Fig. 5.



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Fig. 6.



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UNITED STATES PATENT OFFICE.

ERNEST K. HOOD, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO CLIMAX MACHINERY COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

RECEPTACLE-FILLING MACHINE.

964,781.

Specification of Letters Patent.

Patented July 19, 1910.

Application filed December 26, 1906. Serial No. 349,411.

To all whom it may concern:

Be it known that I, ERNEST K. HOOD, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Receptacle-Filling Machines, of which the following is a specification.

In the preparation of fluids for transportation sale and use it is highly desirable that the receptacles be not only filled accurately—that is, that each receptacle shall have exactly the predetermined quantity of fluid introduced therein—but also that such receptacles be filled with great rapidity.

My present invention relates to a mechanical receptacle filler especially adapted to the handling of fluids.

A machine embodying my said invention will be first described and the novel features thereof then pointed out in claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a view partly in side elevation and partly in vertical section of a machine of the character in question embodying my present invention; Fig. 2 an end elevation of said machine as seen from the position indicated by the dotted line 2 2 alongside Fig. 1; Fig. 3, a similar view, (some portions, however, being broken away to show interior construction) with certain of the parts in a different position from that shown in Figs. 1 and 2, a still other position being also indicated in this figure by means of dotted lines; Fig. 4 a horizontal sectional view, as seen when looking downwardly from the dotted line 4 4 in Fig. 1; Fig. 5, a detail sectional view on an enlarged scale, showing the construction and arrangement of the filling valves more plainly, and Fig. 6, a detail plan view as seen when looking downwardly from the dotted line 6 6 in Fig. 1.

The machine illustrated has been especially designed for filling cans with milk. In this machine the fluid (milk) flows in through a pipe line 21 to a suitable receptacle, as the tank 22. Within this tank are a series of measures 23, the open tops of which are below the level of the top of the tank. The fluid is permitted to flow into the tank 22 until it flows over the tops of the measures 23, so that they are submerged,

and thus fills them. When the fluid has raised to slightly above the tops of these measures 23 the flow is cut off, as by valve 21', and the apparatus is in condition to deliver the measured fluid into receptacles, 60 as cans 81, which are to contain the same, and which it is the purpose of my present invention to accurately and rapidly fill.

The tank 22 is fixedly secured to the posts 31 of the frame, said posts being mounted 65 in the base 32 and connected at the top by suitable frame-members 33. The corner posts 31 also serve as guides or ways for certain of the moving parts, as will presently be described.

A shaft 41 is mounted in suitable bearings 70 in cross-bars 34 of the frame, and is shown as held in the proper longitudinal position therein by collars 42. On the ends of said shaft are similar suitable cross-arms 43 43' 75 (one at each end) and upon one end is secured a hand lever 48 by means of which the rock shaft is operated.

The filling tubes and their valves (presently to be described) by means of which 80 the flow of fluid from the measures to the receptacles is controlled, are carried by rising and falling frames 51 and 61. Said frames are mounted on the combined corner posts and slides 31 of the frame, and are 85 moved appropriately thereon from the cross-arms on the shaft 41 by means of suitable pitmen 44 44' and 45 45' extending from said cross-arms on said shaft to appropriate bearings upon or secured to said frames. In 90 order that the exact movement desired may be secured, and to provide for all necessary adjustment, I make these pitmen telescopic and screw-threaded, as is clearly shown in the drawings. That is to say, the central 95 member *a* of each is provided with right-hand screw threads upon one end and left-hand screw threads upon the other end, which enter correspondingly-threaded end-parts *b* and *c*; and these are securely locked 100 in position, when adjusted, by jam-nuts *d*.

A series of tubes 52, equal in number to the number of the measures 23, are carried by the frame 51, and extend down through the bottoms of said measures where stuffing boxes 105 are provided, as shown. These tubes (see especially Fig. 5) have perforations at suitable points through which the fluid may flow when the valve is in the right position. The lower one of these perforations permits 110

fluid to flow from the measure into the tube, and the upper one is a vent hole to permit any fluid which may be in the tube above that point to escape. These tubes are adjustable relatively to the frame 51 by means of the nuts 53 and 54 thereon.

A series of valve-stems 62 are carried by the frame 61 and extend down into the tubes 52, and carry valves 63. When in the position shown in Fig. 1 these valves are below the openings in the tubes 52 and consequently the egress openings of said measures are closed. When, however, the parts have been moved to the position shown in Fig. 3, the valves are opened, and the fluid is free to flow from the measures, through the tubes 52, into the containing receptacles. These valve stems are adjustable relatively to the frame 61 by means of the nuts 64 and 65 thereon. The valves and valve stems can be removed bodily from the machine by loosening these nuts and swinging the rods to one side, as is indicated in Fig. 6.

I have already stated that in using this machine the tank 22 is first filled until the fluid rises a little above the tops of the measures 23. There is, however, contained within this same tank 22 a displacer 71 of considerable bulk, which, at the time of the inflow extends down into the tank 22, as shown in Figs. 1 and 2. This displacer is connected by means of a rope 72, or otherwise, to the frame 51, said rope passing over suitable sheaves 73 and 74 suspended to the frame part 33. Consequently, when the frame part 51 begins to descend, and considerably before the valves are opened, the displacer 71 starts to rise, and before said valves are open, has been raised far enough so that the general level of the fluid in the tank 22 is below the tops of the measures 23, leaving them exactly full.

Assuming now that the machine is in the position shown in Figs. 1 and 2, and that a supply of fluid sufficient to fill all the measures has been introduced into the tank, and the flow of fluid has been shut off by proper manipulation of the valve 21', and a tray bearing suitable receptacles, as cans, has been introduced into the machine, below the measures, the operation is as follows:—The shaft 41 is swung over by means of the lever 48, and this (through the cross-arms and pitmen) operates the frames 51 and 61. The first portion of the movement operates the frame 51 which carries the tubes 52 down through the stuffing boxes and projects them into the receptacles 81, to a point near the bottom thereof, as best shown in Fig. 3, so that they will discharge the fluid into said receptacles at a point near the bottom, and thus avoid foaming. The frame 61 is next moved a short distance, and, through the rods 62, raises the valves from the position shown in Fig. 1 to the position shown in

Fig. 3, thus opening the passage ways through the tubes from the measures, and permitting the contents of said measures to be discharged into the receptacles. As is perfectly obvious, I am enabled, by this means to measure quantities with absolute accuracy, and to fill the number of receptacles provided for by the capacity of the machine at a single operation. The machine which I have illustrated is constructed and fitted to fill 24 receptacles or cans at a single operation.

In order to provide for the proper order of movements of the parts controlled by the frames 51 and 61 I make the pitmen 44 and 44' with ordinary wrist-pin connections, while the pitmen 45 and 45' are slotted at one end. This, as will be readily understood, enables the frame 51 to travel a sufficient distance to carry the tubes to near the bottom of the receptacles (as shown in Fig. 3) before the frame 61 operates to rise and thus open the valves.

The connections between the cross-arms, pitmen, tube and valve operating frames, and displacer, are such that said several moving parts are substantially counterbalanced. The power to be applied to the lever 48 in manipulating the machine is therefore very slight. The machine can be easily operated by any one, therefore, even a child. As the other parts are not in themselves exactly counterbalanced, the discrepancy is provided for by adding weight to one end of the cross-arms 43 and 43', as shown.

The receptacles 81 are carried during the filling operation by a suitable tray 82. This tray is of the exact size and form necessary to contain and carry the receptacles in question, and is set onto a suitable bed-plate forming part of the frame of the machine. Adjustable gages 37 and 38 are provided, by means of which the trays are guided to the exact position desired, and there held while the receptacles are being filled. Said gages are held to adjusted positions by suitable adjusting and clamping screws, as shown. By reason of the adjustability of the filling tubes and valve-rods in the frames by which they are operated, I am enabled to vary the amounts to be measured, and discharged from the measures, without changing the machine. For example, suppose that the measures are designed to have a maximum capacity of 12 ounces; and it is desired to fill receptacles of only 10 ounces capacity. This can be done by adjusting the filling tubes so that the orifices therein will, when in their lowermost position, be a suitable distance above the bottoms of the measures; the valves being also adjusted accordingly. Any desired amount not exceeding the maximum capacity of the measures may thus be discharged into the receptacles at each operation, and a single machine may

thus be used for filling different-sized receptacles by merely making suitable adjustments.

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

1. The combination, in a receptacle filling machine, of a frame-work having slides or ways, a receiving tank mounted on said frame-work, measures contained within said tank, a displacer also adapted to enter said tank, a movable frame mounted on said slides or ways, a series of tubes carried by said frame and extending down into and through the measures, a second frame also mounted on said slides, valve-rods carried by said frame and extending down into said tubes, valves on said valve-rods, a shaft, cross arms on said shaft, and pitmen running respectively from said cross-arms to the tube-carrying frame and the valve-rod-carrying frame, and a connection also extending between said tube-carrying frame and said displacer.

2. The combination, in a receptacle filling machine, of a receiving tank, a plurality of measures arranged therein whose tops are lower than the top of the tank, a displacer also adapted to enter said tank, a support for receptacles to be filled arranged below the tank, filling tubes leading through the bottoms of the measures and adapted to discharge into the receptacles to be filled, a reciprocating frame for raising and lowering said filling tubes, valves within said filling tubes, valve-rods leading upwardly through said tubes from said valves, a reciprocating frame with which said valve-rods are connected, and connected means whereby the filling tubes are first moved down into the receptacles to be filled and then the valves raised and thus opened, and a flexible connection between the tube-carrying frame and the displacer, whereby, as the tubes descend, the displacer is raised.

3. The combination, in a receptacle filling machine, of a suitable tank, a plurality of measures contained within said tank, filling tubes and valves for each of said measures, and connected means for successively actuating said tubes and valves, said tubes and valves being adjustable in respect to their actuating means.

4. The combination, in a receptacle filling machine, of a tank, a series of measures within said tank arranged to discharge into a corresponding series of receptacles arranged below said measures, filling tubes leading from said measures to said receptacles carried by a reciprocating frame, valves to said filling tubes carried by a second reciprocating frame, a shaft, arms on said shaft, and adjustable pitmen connecting said arms to said tube-carrying frame and to said valve-rod-carrying frame re-

spectively, whereby said filling tubes and their valves are both operated from the same shaft.

5. The combination, in a receptacle filling machine, of a tank, a series of measures within said tank arranged to discharge into a corresponding series of receptacles arranged below said measures, filling tubes leading from said measures to said receptacles carried by a reciprocating frame, valves to said filling tubes carried by a second reciprocating frame, a shaft, arms on said shaft, and adjustable pitmen connecting said arms to said tube-carrying frame and to said valve-rod-carrying frame respectively, whereby said filling tubes and their valves are both operated from the same shaft, one of said pitmen being slotted, whereby one of said frames is permitted a movement before the beginning of the movement of the other.

6. The combination, in a receptacle filling machine, of a tank, a series of measures contained within said tank, the tops of which are lower than the top of said tank, a displacer also adapted to enter said tank alongside said measures, filling tubes and valves whereby the flow from the measures to the receptacles to be filled is controlled, connected means for operating the same, pulleys carried by the frame, and a flexible connection running over said pulleys and connecting said operating means and the displacer, whereby said displacer is raised before the valves are opened and the fluid in the tank thus allowed to fall below the tops of the measures before the discharge of fluid from the latter begins.

7. The combination, in a receptacle filling machine, of a series of measures, filling tubes passing through the bottoms of said measures and containing discharge orifices, a frame to which said tubes are connected and by which they are given vertical movement, means for adjusting said tubes in said frame, valves and valve-rods for opening and closing the discharge orifices, a frame to which the valve rods are connected and by which they are given vertical movement, and means for adjusting the valve rods in said frame, whereby any predetermined quantity not exceeding the capacity of the measures may be measured and discharged thereby.

8. The combination, in a receptacle filling machine, of a tank, measures therein, a fluid displacer also adapted to enter said tank, discharge apparatus for the measures, and a connection between the displacer and said discharge apparatus whereby they are enabled to substantially counterbalance each other and operate synchronously in proper sequence in operation.

9. The combination, in a receptacle filling machine, of a plurality of measures, means for introducing a predetermined quantity of

fluid into said measures, a plurality of filling tubes each communicating with a measure, a carrier for said filling tubes, means for shifting said carrier to project said tubes into and withdraw said tubes from the receptacles to be filled, a plurality of valves one for each of said filling tubes, a common carrier for said valves, an operating member movable about an axis, connections between said operating member and the tube carrier, and connections between the operating member and the valve carrier whereby the weight of said members will be applied to the operating member in opposite directions.

10. The combination, in a receptacle filling machine, of a tank, a plurality of measures arranged therein, a fluid displacer also adapted to enter said tank, a plurality of discharging tubes one for each of said measures, a common carrier for said discharge tubes whereby they may be projected into and withdrawn from the receptacles to be filled, a plurality of valves one for each of said discharging tubes, a common carrier for said valves, an operating member, and intermediate connections between the operating member, the tube carrier, the valve carrier and the displacer, whereby the weights of said members are substantially counterbalanced upon the operating member.

11. The combination, in a receptacle filling machine, of a tank, a plurality of measures arranged therein, a plurality of discharging tubes one for each of said measures,

a common carrier for said discharging tubes whereby they may be projected into and withdrawn from the receptacles to be filled, a plurality of valves one for each of said discharging tubes, a common carrier for said valves, an operating member, intermediate connections between the operating member and the discharge apparatus carriers, a counterbalancing weight, and a connection between said counterbalancing weight and the discharge apparatus carrier.

12. The combination, in a receptacle filling machine, of a stationary tank, a plurality of measures arranged therein having open upper ends lower than the top of said tank, a plurality of discharging apparatus one for each of said measures movable vertically relatively thereto, a carrier for the discharge apparatus whereby the same is reciprocally moved through and relative to the measures, a counterbalancing weight connected to the means for operating the discharge apparatus carrier, and connections between said carrying operating means and said weight.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this twentieth day of December, A. D. one thousand nine hundred and six.

ERNEST K. HOOD. [L. S.]

Witnesses:

CHESTER BRADFORD,
THOMAS W. McMEANS.