J. B. JOHNSON.

MOVING PICTURE MACHINE.

APPLICATION FILED JAN. 29, 1909.

1,027,735.

Patented May 28, 1912.

4 SHEETS—SHEET 1.

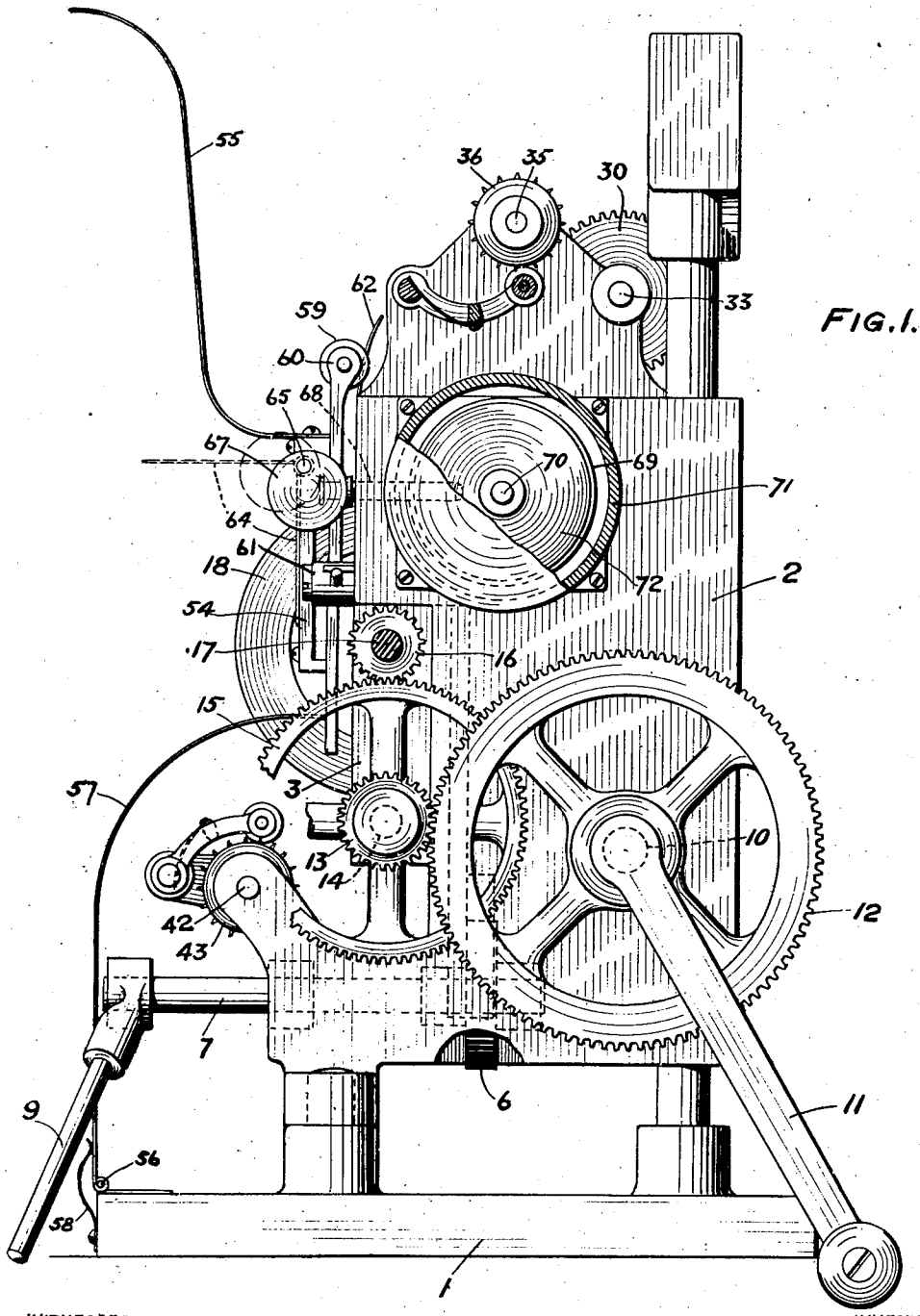



FIG. 1.

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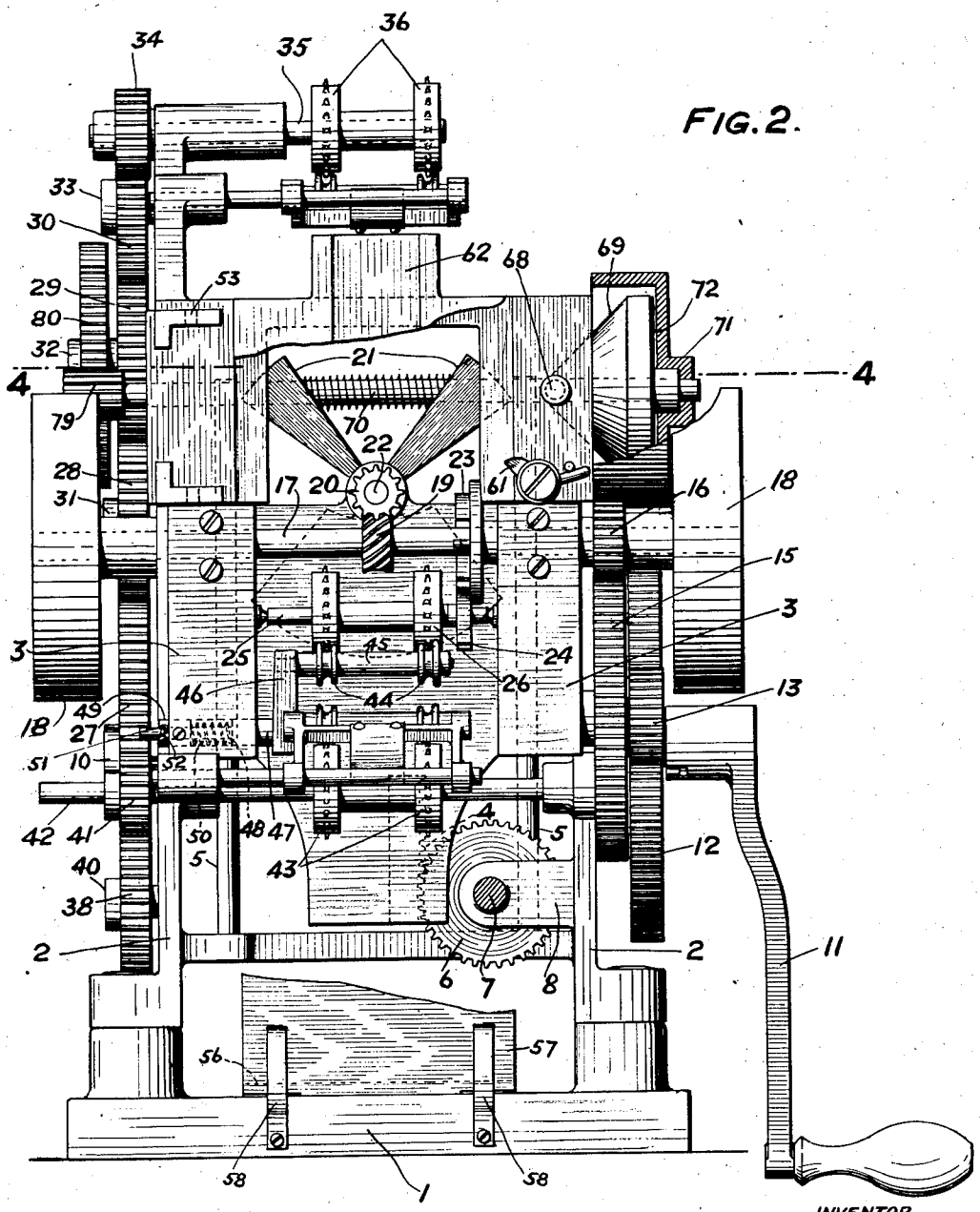
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4 SHEETS—SHEET 2.

FIG. 2.




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4 SHEETS—SHEET 3.

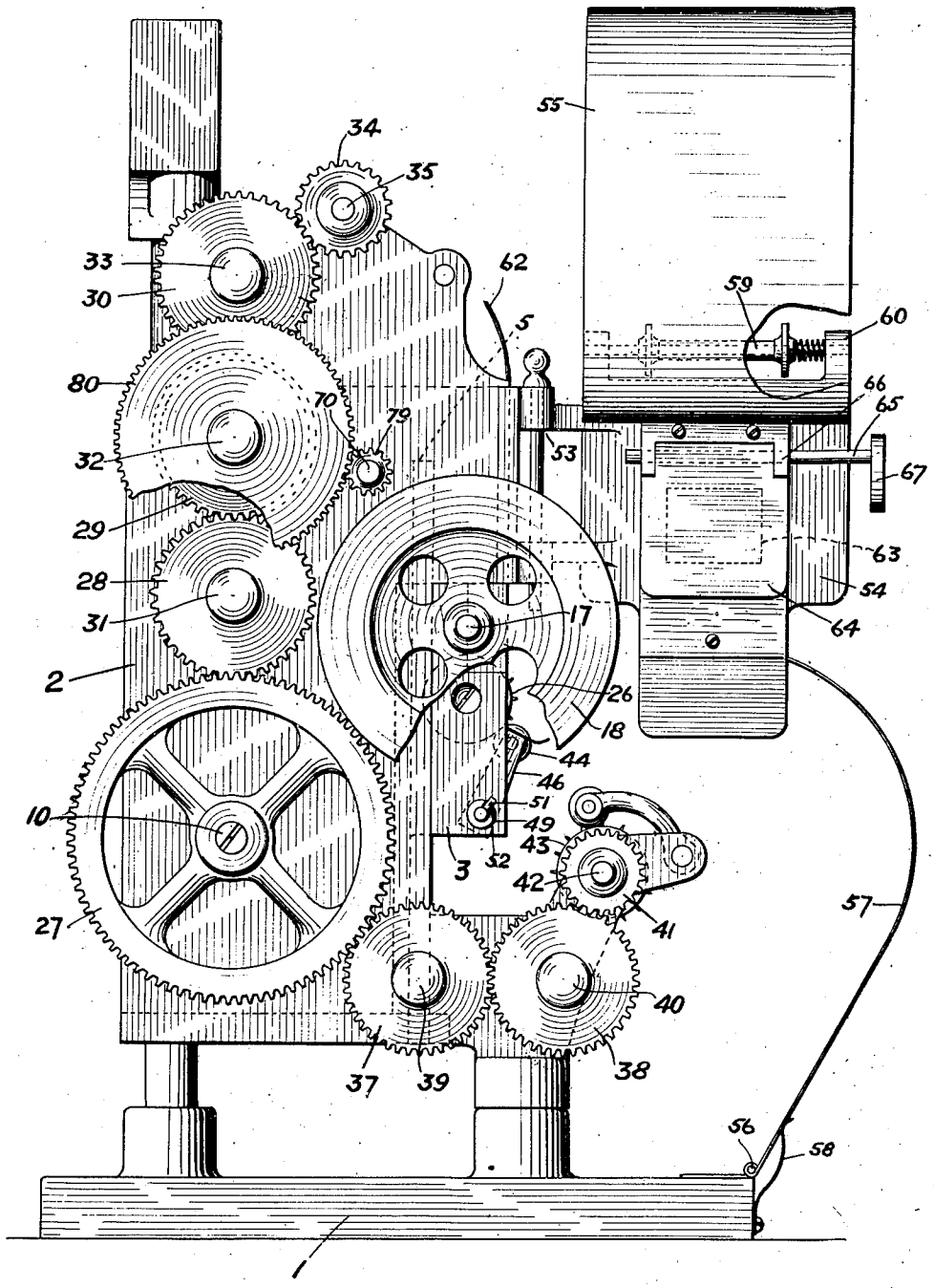



FIG. 3.

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4 SHEETS—SHEET 4.

FIG. 4.

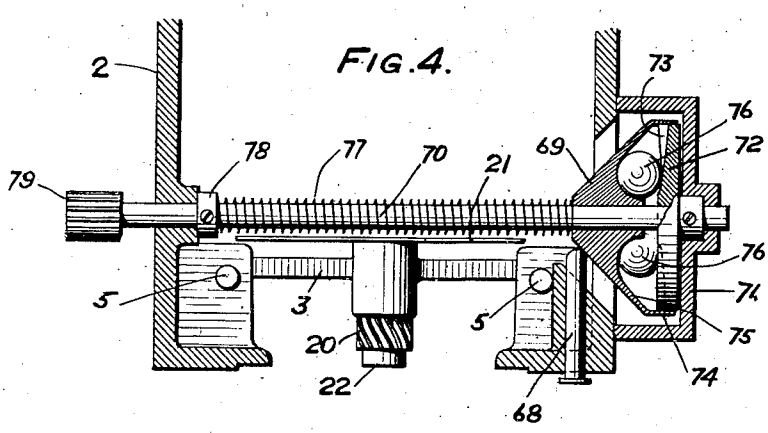
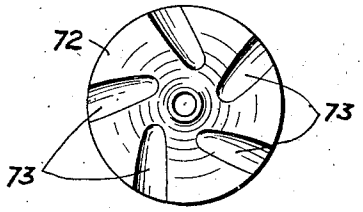



FIG. 5.



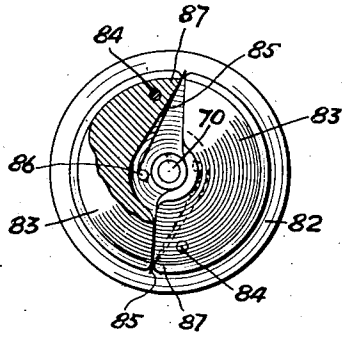




FIG. 6.

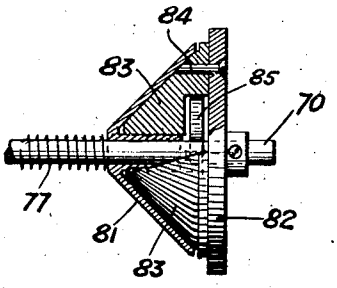



FIG. 7.

WITNESSES:

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INVENTOR

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# UNITED STATES PATENT OFFICE.

JESSE B. JOHNSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SIEGMUND LUBIN, OF PHILADELPHIA, PENNSYLVANIA.

## MOVING-PICTURE MACHINE.

1,027,735. Specification of Letters Patent. Patented May 28, 1912.

Application filed January 29, 1909. Serial No. 474,949.

*To all whom it may concern:*

Be it known that I, JESSE B. JOHNSON, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain Improvements in Moving-Picture Machines, of which the following is a specification.

My invention is a moving picture machine comprising improvements having the characteristics disclosed in the following description and the accompanying drawings in illustration thereof.

In the drawings, Figure 1 is a sectional side elevation of a machine embodying my improvements; Fig. 2 is a sectional rear elevation thereof; Fig. 3 is a sectional elevation of the side opposite that shown in Fig. 1, the door being open; Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2; Fig. 5 is a view of the base coacting with the cone shown in Fig. 4; Fig. 6 is a view of the base for carrying a modified cone with features used in a modified form of the machine, and Fig. 7 is an axial sectional view of the modified cone with its connections.

The machine, as illustrated in Figs. 1 to 5 inclusive, has the base 1 with the frame 2 fixed thereon. A carriage 3, having the rack 4, is movable vertically on guides 5 fixed to the frame. A gear 6 engages the rack and is fixed on a shaft 7, the shaft being journaled in the frame brackets 8 and turned by a handle 9 fixed thereon to effect the movement of the carriage.

The driving shaft 10, journaled in the frame 2 and revolved by the handle 11, has fixed thereon the driving gear 12 which revolves the pinion 13, the latter being fixed on a shaft 14 journaled in the carriage 3. A gear wheel 15, fixed on the shaft 14, revolves a pinion 16 fixed on a shaft 17 which is journaled in the carriage 3. As the vertical movement of the carriage is not great and as the movement carries the small gear 13 tangentially to the large gear 12, they remain in mesh. The arc of the gear 12, subtended between its highest and lowest points engaged by the gear 13, does not depart sufficiently from a straight line to interfere with the desired operation. The shaft 17 has thereon the fly wheels 18 for steadying its action, the spiral gear 19 engaging the under side of the like spiral gear 20 which revolves the shutter 21 through the shaft 22 journaled in the carriage, and the Geneva element 23 which gives step by step movement to the complementary element 24 on the shaft 25, the latter being journaled in the carriage 3 and giving an intermittent movement to the intermediate feeding sprockets 26 fixed thereon. The shaft 10 has fixed thereon the second driving gear 27 which (through the engaging idler gears 28, 29 and 30 journaled by the spindles 31, 32 and 33) revolves the pinion 34 fixed to the shaft 35, the latter being journaled in the frame 2 and having fixed thereon the upper film feeding sprockets 36. The driving gear 27 also acts, through the engaging idler gears 37 and 38 journaled by the spindles 39 and 40, on the pinion 41 fixed to the shaft 42, the latter being journaled in the frame and carrying the lower film feeding sprockets 43.

The intermediate sprockets 26 have coacting therewith the film guiding rollers 44 revoluble on a journal 45 which is carried by a crank arm 46, the arm being carried by a journal 47 revoluble in the carriage 3. The journal 47 is provided with the shoulder 48 between which and a bearing 49 fixed in the carriage is a coiled spring 50, the journal being movable longitudinally and having a pin 51 which engages a notch 52 in the bearing. Hence when the pin lies in the notch the rollers are held up to the sprockets, but when it is desired to adjust the film held to the sprockets by the rollers the latter may be withdrawn by drawing back the arm and disengaging the pin from the notch, the rollers being held in either position by the spring.

The frame has connected thereto, by the hinges 53, the door 54, which carries the shield 55 for supplementing the door's action of protecting the film, particularly against fire, and connected to the base by a hinge 56 is a further shield 57 which is caused, by the spring 58, to bear against the bottom of the door when the latter is closed, the hinges permitting this shield to be drawn back when it is desired to open the door.

A guiding roller 59 is journaled in bearings 60 carried by the door and when the latter is held closed by the latch 61 this roller coacts with the way 62 fixed to the frame for guiding the film.

The door has the usual light aperture 63 and the automatically closing fire screen or shutter 64, the latter being fixed to a shaft 65 which is journaled in bearings 66 on the door.

The screen 64 is automatically raised, to open the light aperture 63, when the machine is in normal operation, by means of a cam 67 fixed on the shaft 65, a pin 68 longitudinally movable in the frame in contact with the periphery of the cam, and a cone 69 movable axially on the shaft 70 with its surface in contact with the pin. The shaft 70 is journaled at one end in the frame 2 and at the other end in a cap 71 which is detachably connected to the frame. Fixed to the shaft within the cap is a base 72, having the form of a disk, containing the similarly disposed races 73. The cone 69 has the peripheral flange 74 movable over the periphery of the base 72 and the concavo-conical interior surface 75, balls 76 being engaged between the races of the base and the interior surface of the cone. A coiled spring 77, supported by a collar 78 on the shaft 70, bears against the top of the cone and causes the interior conical surface thereof to act to move the balls 76 toward the shaft. A pinion 79 is fixed on the shaft 70 and, through its engagement with a gear 80 fixed to the idler 29, revolves the shaft, whereupon the balls move outward from the axis of revolution, the cone is moved along the shaft thereby, the pin 68 is moved outward by the cone, the cam 67 is revolved by the pin, and the screen 64 is raised to uncover the aperture 63. As the speed of revolution decreases the spring moves the cone back and the weight of the screen causes it to drop, the cam simultaneously effecting the retraction of the pin.

In the modified construction shown in Figs. 6 and 7, the cone 81 is substituted for the cone 69, the base 82 is substituted for the base 72, and the wings 83 are substituted for the balls 76, the wings having the eccentric pivotal connections 84 with the base 82. Springs 85, connected to the base near the shaft 70 by pins 86, bear against the points 87 of the wings to bring the latter together in the relation shown in Fig. 6 and the coiled spring 77 acts on the cone 83 to bring it to the position shown in Fig. 7, the conical interior surface of the cone fitting the conical exterior surfaces of the wings. When the shaft 70 is revolved, the wings swing outwardly and cause the cone 81 to move along the shaft 70 to lift the screen through the mechanism described in connection with the cone 69. As the speed of the revolving shaft decreases, the wings move inwardly, the spring 77 retracts the cone and the screen is permitted to fall.

It will be understood from the foregoing description that the carriage can be readily adjusted to adjust the position of the film section exposed in the optical axis of the machine, together with the intermittently operating film feeding mechanism and light interrupting shutter; that the film guiding devices are readily operated to accurately control the movement of the film while being readily separable to permit its insertion and withdrawal; that the shutter operating gears have the advantages of permitting the shutter to lie closer than is usual to the parallel shaft for driving it, while the helical character of the gear teeth provide a rolling contact which avoids the rattling of usual gears; that the screen operating mechanism is simple, efficient and practically unexposed, and that the film is effectively screened or shielded by convenient devices.

Having described my invention, I claim:

1. In a motion picture machine, a member having an aperture therein, a screen movable to open and close said aperture, a revoluble shaft, a cone movable longitudinally on said shaft, means operated by the revolution of said shaft to move said cone longitudinally, and means whereby said cone moves said screen to open said aperture.

2. In a motion picture machine, a door having an aperture therein, mechanism for feeding a film across said aperture, a shaft connected and revoluble with said film feeding mechanism, a cone longitudinally movable on said shaft, means whereby the revolution of said shaft moves said cone, a reciprocating pin movable by said cone, a screen and means whereby said pin moves said screen to open said aperture.

3. In a motion picture machine, a door having an aperture therein, a screen carried by said door and movable across said aperture, a revoluble shaft, on said shaft a member having an inclined surface, means whereby the revolution of said shaft moves said member, and means whereby said inclined surface moves said screen on the movement of said member.

4. In a motion picture machine, a movable screen, a revoluble shaft, a device having an inclined surface movable longitudinally on said shaft, a base fixed to said shaft, a means between said device and base, said means moving outwardly on the revolution of said shaft to move said device, and means whereby said device moves said screen.

5. In a motion picture machine, a hinged door having an aperture therein, a screen journaled on said door, a cam fixed to said screen, a reciprocating pin making contact with said cam, a revoluble shaft, a device movable longitudinally on said shaft, said device having an interior and an exterior surface inclined to said shaft, a base fixed to said shaft, and means supported by said base whereby said device is moved and moves said pin on the revolution of said shaft.

6. In a motion picture machine, a movable screen, means movable by centrifugal action from an axis of revolution, a device having an inclined surface movable along said axis by said means, and means operated by said inclined surface for moving said screen.

7. In a motion picture machine, a movable screen, a revoluble shaft, revoluble means comprising a wing pivoted on an axis parallel to and revolved by said shaft, a device having an inclined surface movable along the axis of said means by said wing, and means operated by said device for operating said screen.

In witness whereof I have hereunto set my name this 22nd day of January, A. D. 1909, in the presence of the subscribing witnesses.

JESSE B. JOHNSON.

Witnesses:
Jos. G. Denny, Jr.,
Robert James Earley.