

(No Model.)

W. HOLZER.

MANUFACTURE OF INCANDESCING ELECTRIC LAMPS.

No. 295,398.

Patented Mar. 18, 1884.

Fig. 2.

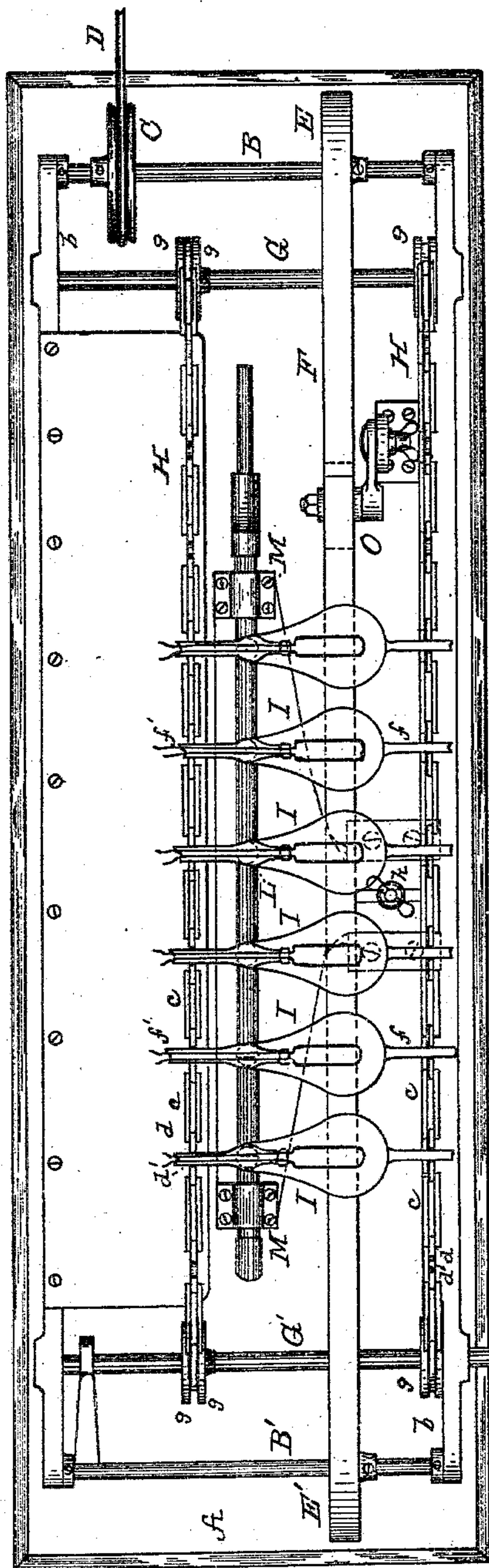


Fig. 1.

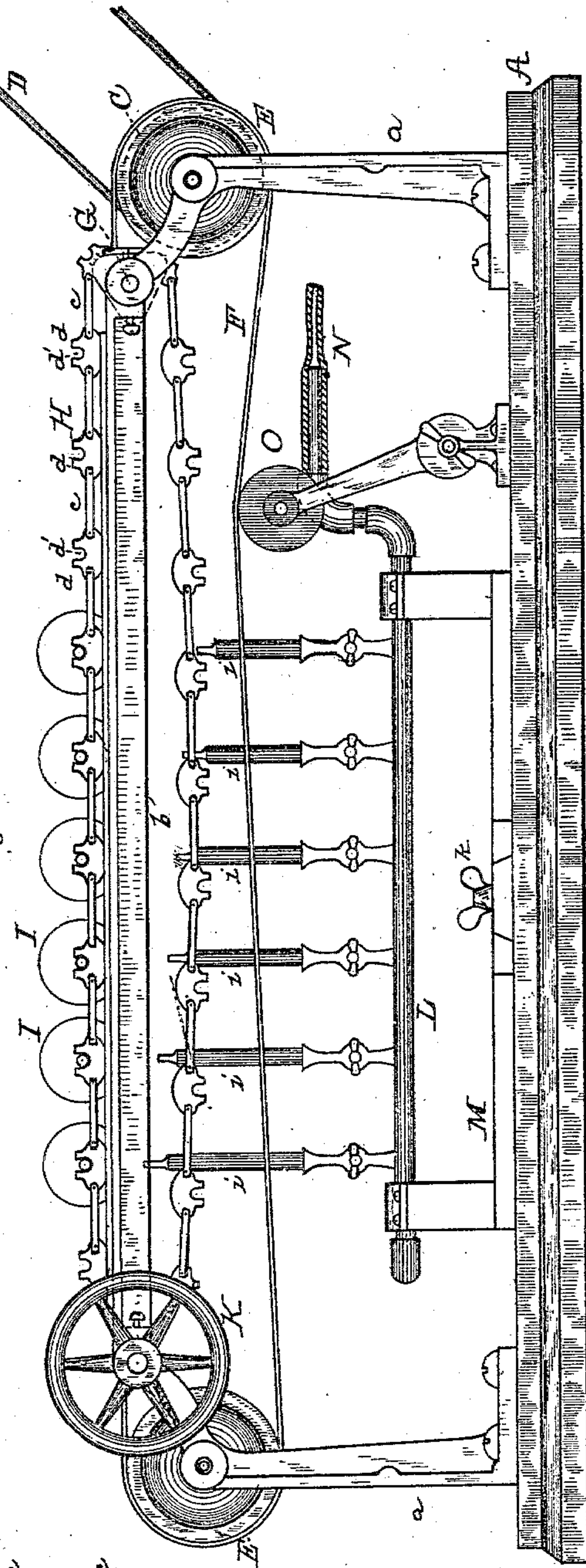


Fig. 3.

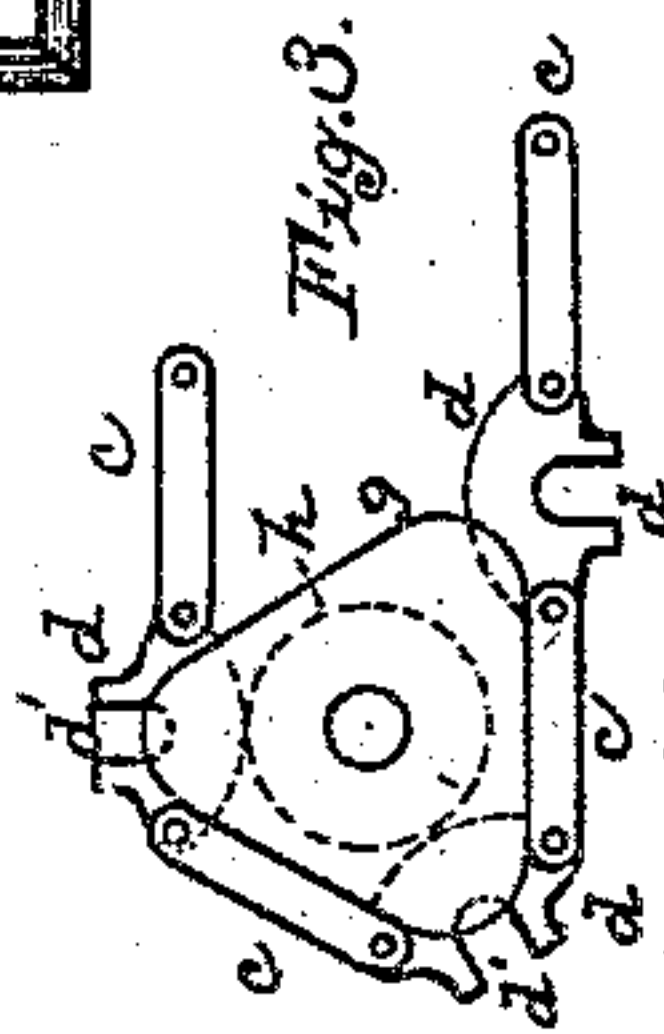
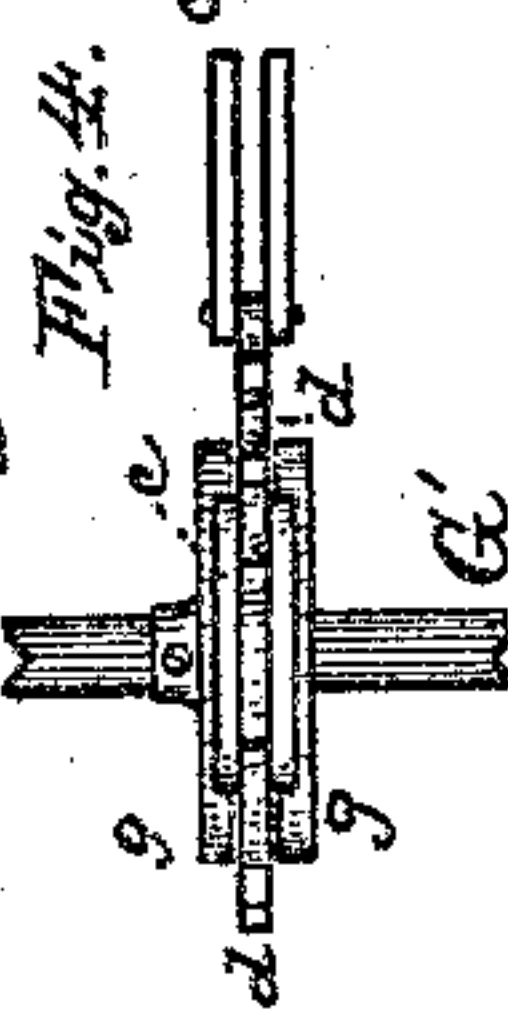


Fig. 4.



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# UNITED STATES PATENT OFFICE.

WILLIAM HOLZER, OF HARRISON, NEW JERSEY, ASSIGNOR TO THE EDISON LAMP COMPANY, OF SAME PLACE.

## MANUFACTURE OF INCANDESCING ELECTRIC LAMPS.

SPECIFICATION forming part of Letters Patent No. 295,398, dated March 18, 1884.

Application filed June 7, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM HOLZER, of Harrison, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in the Manufacture of Incandescent Electric Lamps, (Case H,) of which the following is a specification.

In manufacturing incandescent electric lamps the glass portions of a lamp are made in two separate parts—an inclosing bulb or globe and a tube or stem in which the leading-in wires are sealed, the incandescent conductor being first attached to said leading-in wires. This tube or stem is inserted within the globe, and is then sealed thereto by fusing the glass at the junction of the two parts. The point of sealing is thus of course at a high temperature, and if it were allowed to cool suddenly the glass would crack at this point. It is necessary therefore to gradually reduce the temperature of the sealing-point.

The object of my invention is to provide a method and apparatus for accomplishing this gradual cooling. Such apparatus consists of a series of stationary burners arranged to produce different relative intensities of heat, and means situated above them for holding a number of lamps with the points of junction of their globes and stems immediately above the burners. Means are provided for moving the series of lamps over the burners, so that each lamp is brought successively over burners which produce gradually-decreasing temperatures. Each lamp is also continually revolved above the burners, so that all sides of the joint receive the same heat. The lamps are preferably supported in holders carried by endless chains passing over pulleys, and they rest, also, upon a belt which is continually in motion, so that the lamps constantly revolve, the holders being constructed to permit such revolution. Means are provided for moving the endless chains, so that the lamps can be moved from one burner to the next.

The apparatus which I prefer to employ is illustrated in the annexed drawings, in which Figure 1 is a front elevation; Fig. 2, a top view thereof. Fig. 3 is an elevation of one of the pulleys over which the endless chains run, and Fig. 4 a top view thereof.

A is a suitable base, from which standards *a a* rise, and longitudinal pieces *b b* connect these standards, forming a frame. At one end of such frame a shaft, B, extends across, and at the other end a shaft, B'. Upon the shaft B is mounted a pulley, C, from which a belt, D, extends to any suitable source of power, and a pulley, E, from which a belt, F, runs to a pulley, E', on shaft B'. In Fig. 1 the pulley C is shown by dotted line. Shafts G and G' also extend across the supporting-frame, on each of which are mounted two pulleys, and over these pulleys are placed the endless chains H H. Each chain H consists of links *c*, which connect flat plates *d*, each having a notch, *d'*, in its edge, and such notches being adapted to receive the glass tubes, which are the extremities of the lamp at this stage of its manufacture. Each lamp I is placed across the two chains H H, its exhaust-tube *f* being supported by one holder *d* and the end of its stem *f'* being held in the opposite holder, while the globes themselves rest upon the belt F. The pulleys over which the chains H run consist each of two triangular plates, *g*, between which is a wheel, *h*. The holders *d* in passing over the pulleys bear upon the wheel *h*, their edges being curved oppositely to the wheel, while the links *c* bear on the edges of the two triangular plates. The chains are moved by means of the hand-wheel K on the shaft G'. It will be seen that on turning this wheel the plates *g* will be thrown over, so that the chains will be moved the distance of one link.

L is a gas-pipe supported from a base, M, and connected by flexible tube N with the source of supply. Extending above the pipe L is a series of burners, *i i*. These burners are placed the same distance apart as the holders *d*. They are shown as of different heights, so that they produce different intensities of heat upon the lamps placed above them; but the same effect may of course be produced by using burners of different power, or in other ways. The base M is adjustable along the base A, being held by the set-screw *k*, so that the burners can always be brought to the proper points with relation to the holders above them.



A belt-tightener, O, is provided for regulating and adjusting the motion of the belt F.

The manner of operating the apparatus is as follows: As soon as the parts of a lamp, I, are joined together, as above explained, it is placed across the chain H, resting upon the belt F, and immediately above the burner i, which is arranged to produce the greatest heat, and is revolved above said burner by the belt F. The seal is thus equally heated on all sides. Another lamp is then prepared, and is placed in the holders next to those of the first lamp, and the wheel K is turned so as to bring said first lamp over the second burner of the series and the second lamp over the first burner. This operation is repeated as successive lamps are prepared, until the first lamp has passed over all the burners being thus subjected to successive diminutions of heat, and over the several holders which extend beyond the burners, to allow a still further gradual cooling. The first lamp is then removed, and the others follow it in succession, a new lamp being placed in the series whenever an old one is removed.

What I claim is—

1. The combination of a series of burners adapted to produce a gradual diminution of heat, and one or more lamp-holders arranged to travel above them, whereby a gradual cooling of said lamp is effected, substantially as set forth.

2. The combination of a series of burners arranged to produce a gradual diminution of heat, a series of lamp-holders arranged to travel above said burners, and means for revolving the lamps in their holders, substantially as set forth.

3. The combination, with the series of burners arranged substantially as described, of the series of lamp-holders, means for moving such holders a distance equal to that between the burners at each movement, and means for con-

tinually revolving the lamps in the holders, substantially as set forth.

4. The combination, with the series of burners, of the endless chains carrying the lamps, and the belt on which also the lamps rest, substantially as set forth.

5. The endless chains formed of links connecting lamp-holders together, substantially as set forth.

6. The lamp-holders, consisting of notched plates joined together by links, substantially as set forth.

7. The combination, with the lamp-holding devices, of the adjustable series of burners, substantially as set forth.

8. The combination of the series of burners arranged to produce a gradual diminution of heat, and the series of lamp-holders, the latter extending beyond the last of the burners, substantially as and for the purpose set forth.

9. The combination, with the lamp-holders, of the series of burners of successively-decreasing height, substantially as set forth.

10. The method of annealing a sealed joint in an incandescing electric lamp, consisting in passing the lamp over a series of burners of gradually-diminishing intensity of heat, substantially as set forth.

11. The method of annealing a sealed joint in an incandescing electric lamp, consisting in passing the lamp over a series of burners of gradually-diminishing intensity of heat, at the same time continually revolving said lamp, substantially as set forth.

This specification signed and witnessed this 17th day of May, 1883.

WILLIAM HOLZER.

Witnesses:

H. W. SEELY,  
W. J. LATUS.