Oct. 21, 1924. 1,512,703

H. DE F. MADDEN

TRAY LOADING DEVICE

Filed July 21, 1922 2 Sheets-Sheet 1

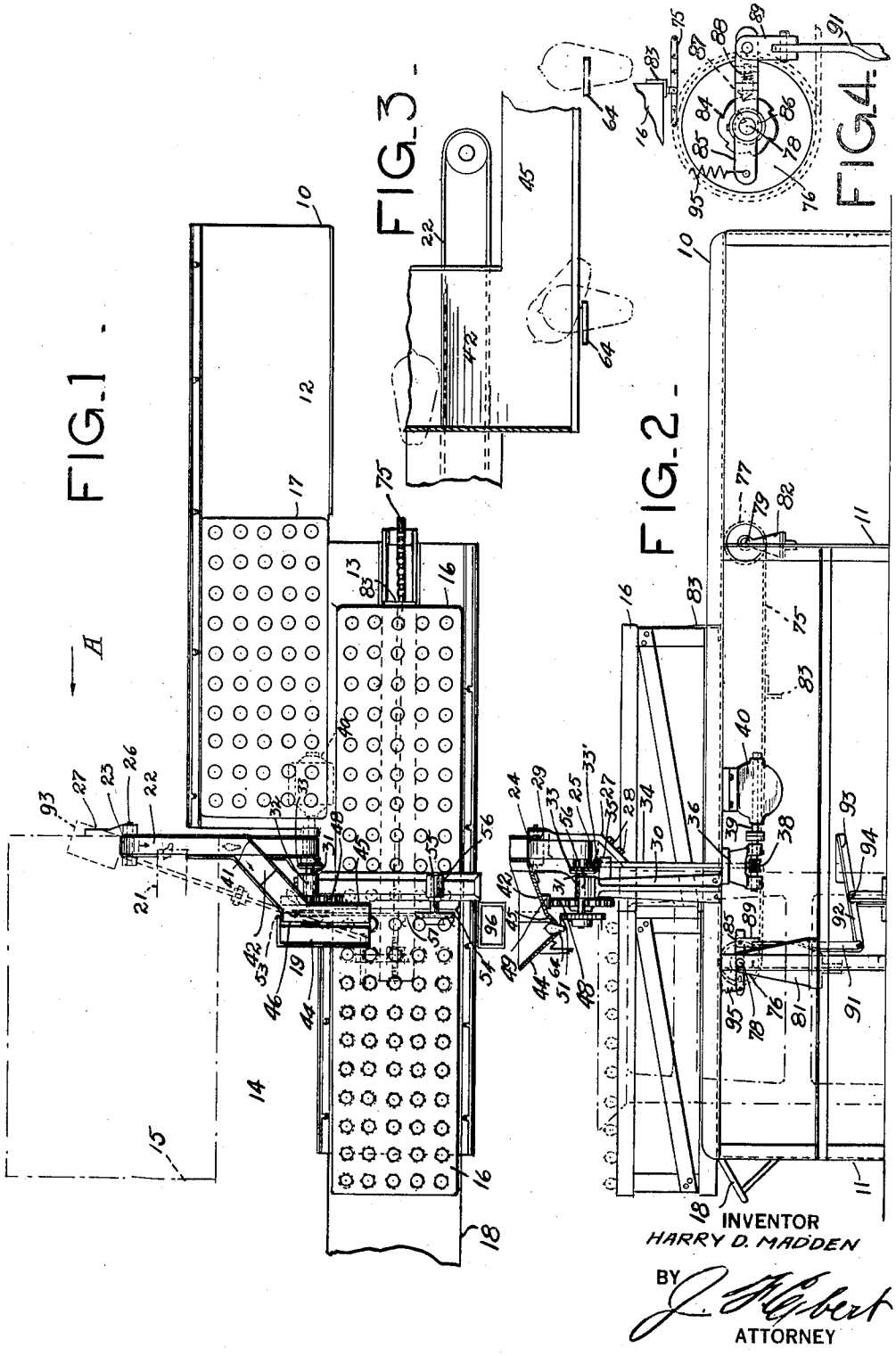


FIG. 1.

FIG. 3.

FIG. 4.

FIG. 2.

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2 Sheets-Sheet 2

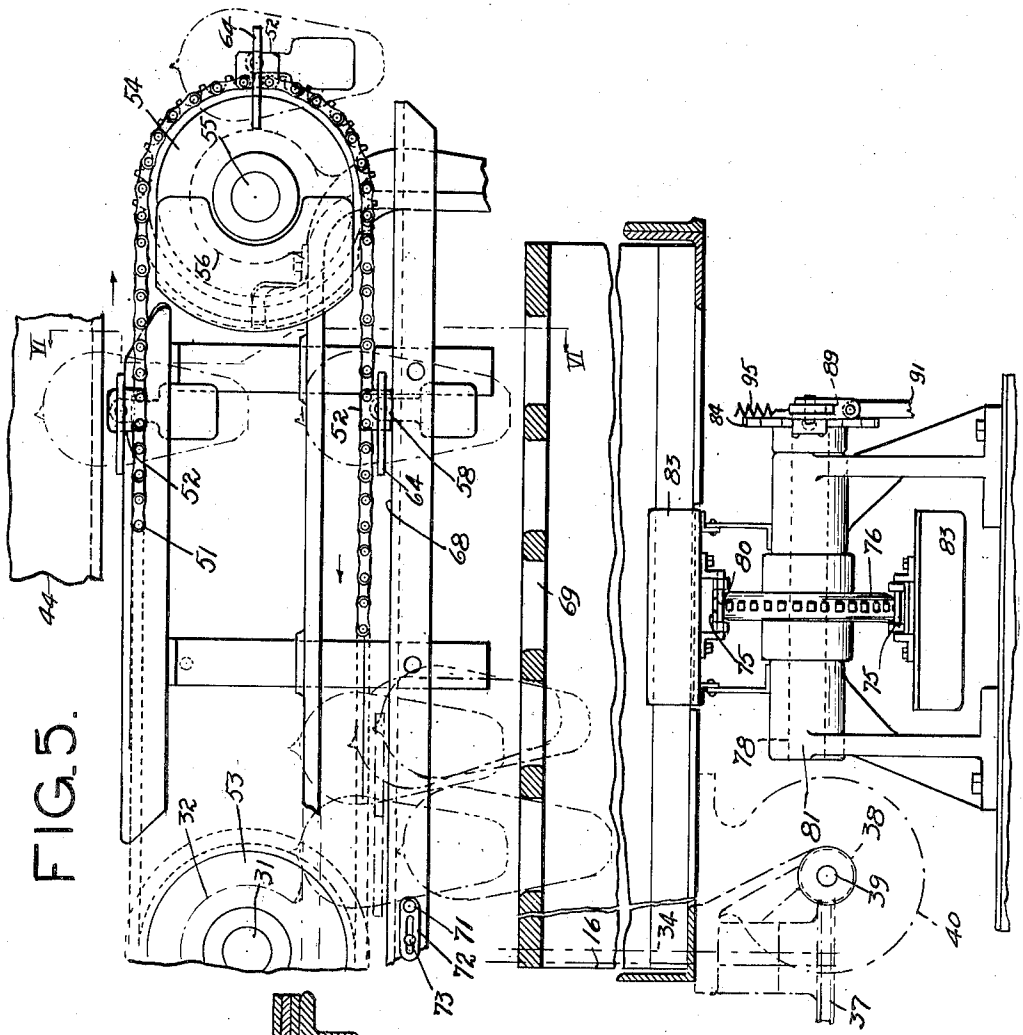


FIG. 5.

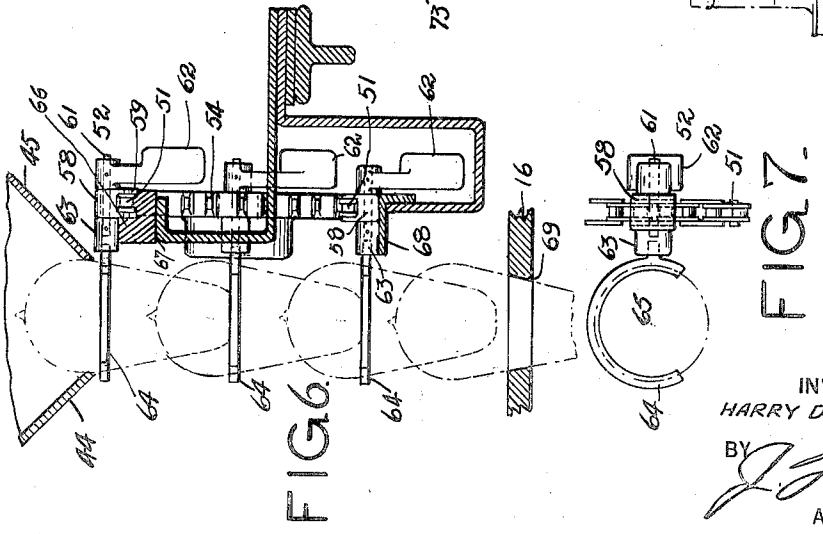


FIG. 6.

FIG. 7.

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Patented Oct. 21, 1924. 1,512,703

UNITED STATES PATENT OFFICE.

HARRY DE FOREST MADDEN, OF NEWARK, NEW JERSEY, ASSIGNOR TO WESTINGHOUSE LAMP COMPANY, A CORPORATION OF PENNSYLVANIA.

TRAY-LOADING DEVICE.

Application filed July 21, 1922. Serial No. 576,438.

To all whom it may concern:

Be it known that I, HARRY DE FOREST MADDEN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Tray-Loading Devices, of which the following is a specification.

This invention relates to a machine for handling fragile articles and relates more particularly to the conveyance and disposition of electric incandescent lamps.

An object of the present invention is to provide co-ordinating machine elements for positioning lamps in a rack.

Another object of the invention is to provide a portable conveyor apparatus applicable to a lamp-making machine for the reception and disposition of articles discharged from the machine.

A further object of the invention is to provide for the automatic transportation of articles from a machine to given positions for distribution.

Other objects and advantages will be apparent from the following description.

It will be appreciated that, in the manufacture of electric incandescent lamps, considerable care must be exercised on the part of the operators, when removing lamps from a machine, to dispose the lamps in suitably situated racks.

Heretofore, it has been customary for the operator, upon removing a finished or unfinished lamp from a machine, to deposit such lamp in an aperture of a conveniently positioned rack. A rack for supporting lamps usually consists of a frame for supporting a table or plate in which a plurality of symmetrically disposed apertures are provided. The apertures are so porportioned as to permit the entrance of the small end of a lamp therethrough, thus permitting the enlarged or bowl portion of the lamp to rest upon the perimeter of the aperture and be thereby supported. Upon the removal of a lamp from a machine, the operator, therefore, must exert a certain amount of attention and skill in order to successively deposit the lamps in the proper apertures of the rack.

This operation obviously consumes a considerable portion of time which is necessarily subtracted from other duties, and the speed of production is reduced accordingly.

The present invention eliminates the manual operation as above described and provides means for receiving lamps from a machine and for conveying and automatically depositing such lamps in the apertures of a rack.

A machine for practicing my invention may include a support comprising contiguous guide surfaces or platforms disposed in the same horizontal plane and off-set with respect to each other. This platform may be supported on any suitable frame or structure and may be readily transported from one lamp-making-machine to another. Mechanism for receiving articles and for conveying and depositing them may be carried by the platform; a unitary portable conveyor apparatus is thus provided.

The mechanism for conveying articles may consist of a belt conveyor for receiving lamps from a lamp-making-machine and transporting them to a hopper in which the lamps may be adjusted to a given position. The adjusted lamps are subsequently removed from the hopper, by a chain having hooks associated therewith, for conveying the articles to a position adjacent openings in a tray in which they are to be deposited. After one series of openings in the rack has been filled, the rack is shifted to bring another series of openings into position. When completely loaded, the rack is removed.

One embodiment of the invention is illustrated in the accompanying drawings in which,

Fig. 1 is a plan view of the present invention applied to a lamp-making machine which is indicated in dotted lines;

Fig. 2 is a side view, in elevation, of the machine shown in Fig. 1;

Fig. 3 is an enlarged detail of a portion of a belt conveyor and a lamp-receiving element;

Fig. 4 is a fragmentary view of ratchet mechanism for moving a tray conveyor intermittently;

Fig. 5 is an enlarged detail of a chain conveyor, partly broken away, and also shows a rack in loading position;

Fig. 6 is a vertical section taken on line VI—VI of Fig. 5; and,

Fig. 7 is a plan view of one of the lamp-carrying members which constitute parts of a conveyor.

The machine, as illustrated, may include a support 10, (see Figs. 1 and 2) carried at a suitable elevation by legs 11. The support may comprise two horizontal platforms or surfaces 12 and 13, having their edges contiguous and offset so as to provide an indentation 14 for the disposition of the lamp-making machine from which lamps may be fed to the conveyor apparatus. A machine 15 so positioned is indicated in dotted lines in the drawing. An operator, when in attendance upon the machine, may be located in the position indicated by the letter "A" and may face in the direction of the arrow.

The support 10 may be constructed to accommodate a plurality of trays or racks 16 to be filled with lamps from the lamp-making machine and it also may accommodate a plurality of trays or racks 17 having deposited therein a plurality of lamps preparatory to their insertion in the machine for certain operations thereon. The surface 12 of the support may be employed to support the racks containing lamps to be treated while the surface 13 may be utilized to support racks for the reception of lamps discharged from the machine. These surfaces may be respectively termed the unloading and the loading platforms.

In the present embodiment of the invention, lamp racks are employed having lamp-receiving apertures disposed in equally spaced relation and preferably consisting of ten transverse rows of five apertures to each row. When a rack is disposed in operative relation to the depositing mechanism of the conveyor, the lamps are positioned in the racks transversely thereof, that is, starting at one side of a rack, five lamps are successively positioned in a transverse row of apertures. The rack is then advanced to position another row of apertures in proper relation to the depositing mechanism.

When a rack has been completely filled with lamps, it will have been sufficiently advanced to permit the placement of another empty rack upon the platform 13. The empty tray utilized is the one from which the operator has removed the lamps for insertion into the machine. The lamps are subsequently discharged from the machine and loaded into the tray 16 on the platform 13. A filled rack may be ejected from the platform 13 by a forward movement of the tray causing it to move down an incline 18 and away from the apparatus.

Mechanism for adjusting or positioning a lamp preparatory to its removal by depositing mechanism may be termed a lamp-positioning element. This positioning element is indicated, as a whole, by the numeral 19. Lamps discharged from the lamp-making machine 15 may move down a suitable guide or chute 21 which is indicated in dotted lines. This guide is provided to lead discharged lamps to an endless belt conveyor 22 which is rotatable upon pulleys 23, 24 and 25. The first mentioned pulley is secured to a shaft 26 journaled in a suitable bearing 27 which may be readily attached to any lamp-making machine by means of a clamp or bolts 28. The pulley 24 serves as an idler and may be secured to a shaft 29 journaled in a bearing integral with a bracket 30 fastened to the platform or stationary structure of the apparatus.

The pulley 25 constitutes the driving member and is secured to a shaft 31 journaled in a bearing 32 which is also integral with the bracket 30. The shaft 31 is provided with a beveled gear 33 disposed in mesh with a beveled gear 33′ fastened at the upper end of a vertical shaft 34 which may be supported in suitable bearings 35 and 36. The lower end of the shaft which extends through the bearing 36 has fastened thereto a worm wheel 37 (see Fig. 5) which engages with a worm 38 fastened to a shaft 39 of a motor 40 secured to the underside of the platform 12.

A lamp discharged from a machine may be guided down the chute 21, and onto the conveyor 22 upon which it may travel until it makes contact with a guide member 41 which directs the lamp down a chute 42. At the lower end of this chute is disposed the lamp-positioning element 19 which may comprise a V-shaped receptacle or hopper for the reception of the lamps. This element may consist of a pair of plates 44 and 45 so positioned that their lower edges are in parallel relation and spaced apart so as to provide an elongated aperture 46 of sufficient width to permit the passage of the smaller or base portion of a lamp therethrough. After a lamp has moved or rolled down the chute 42 and has entered the trough 43, the small heavy end of the lamp may enter the aperture of the trough and the lamp may pass approximately two-thirds of its length therethrough and will, therefore, adjust itself and be supported in a substantially vertical position at points slightly below the plane of its greatest diameter as shown in Fig. 3. A lamp may thus be automatically adjusted and disposed in a position for convenient removal.

When desirable, means may be provided for vibrating or agitating a portion of the V-shaped receptacle and the chute 42, the latter being divided and pivoted at 47. Agitating mechanism may comprise a toothed wheel 48 secured to the shaft 31 and disposed in engagement with a lug 49 fastened to the underside of the chute 42. A rotation of the wheel 48 will, therefore, cause a vibration of the trough in a more

or less violent degree, depending upon the depth and pitch of the teeth upon the wheel 48.

After a lamp has been positioned in the aperture 46 of the trough, it is removed, by means of a chain-conveyor 51 (see Fig. 5) which is provided with a plurality of carriers 52 pivoted to, and uniformly spaced throughout the length of, the chain. The conveyor is driven by chain sprocket wheels 53 and 54 which are secured to shafts 31 and 55, respectively, journaled in suitable bearings 32 and 56, respectively, integral with the bracket 30. The shaft 31 is, as above described, driven by means of the motor 40 and, consequently, the sprocket wheel 53 serves as a driving member for the chain conveyor.

The pivoted carriers 52 may comprise a bearing member 58 provided with a U-shaped or slotted portion 59 adapted to embrace one of the links of the chain 51 to which the member may be suitably secured by means of the pins or bolts at each end of one of the links.

Disposed in the bearing member 58 is a shaft 61 which may project from opposite sides thereof. Rigidly secured to one end of the shaft 61 is a weighted member 62 and upon the other end of the shaft is fastened a guide block 63 having a claw or hook member 64 rigidly secured thereto. The member 64 may be provided with a notch or recess 65 having a perimeter slightly greater than a semi-circle, and the edge thereof is maintained in a horizontal plane during the horizontal movement of the member partly by reason of the guide block 63 which makes contact with a guide surface 66 and, during its rotary movement about the sprockets, by reason of the relative position of the weighted member 62.

After a lamp has taken a position in the aperture 46 of the element 19, the chain 51 may be automatically operated to move the claws or hook-members 64 beneath the aperture to effect an engagement of one of the hook-members with the projecting lower portion of a lamp. The hook-member will, therefore, cause the lamp to slide along the edges of the aperture 46 and, upon reaching the end of the aperture, the lamp will drop and be received by the hook-member and firmly supported.

A lamp, positioned in a hook-member 64 of the carrier 52, will then travel around the periphery of the sprocket wheel 54 but will maintain its vertical position during such movement, after which a surface of the bearing block 58 will make contact with a lower guide surface 68 to maintain a relatively fixed position of the carrier during its movement over apertures 69 of tray 16. The conveyor then moves the carrier to bring the lamp supported in the hook-member in given relation to an aperture adjacent the edge of a tray which may be one of a row of apertures and termed the first aperture of a row.

In order to strip or remove the lamp from the carrier, a finger 71 is provided in the path of movement of a lamp, as indicated in dotted lines in Fig. 5. The finger 71 makes contact with a lamp and slightly lifts and tips the lamp out of the hook-member 64, causing the lamp to drop in such manner that its smaller or lower end will enter a suitably positioned aperture of the tray and the lamp will thus be positioned as required. The finger 71 is carried on a slotted arm 72 and is secured to any suitable portion of the structure by a bolt 73. Thus, the finger may be adjusted to bring it into proper relation to properly unseat a lamp from the carrier.

When a lamp is in position, the carrier may continue to move and a following carrier may bring another lamp from the element 19. The succeeding lamp is removed from the carrier by contact with the lamp already in position, as is also indicated in dotted lines in Fig. 5. This second lamp, in turn, acts in the same manner as the previous lamp to remove a succeeding lamp from the carrier. This operation is repeated until lamps have been deposited in all the apertures in a given row. The operator then actuates mechanism to advance the rack to position another row of apertures in operative relation to the carriers. This mechanism may consist of a chain 75 movable about toothed wheels 76 and 77 rotatable about shafts 78 and 79, respectively. The teeth of the wheels 76 and 77 engage with links 80 of the chain. The shaft 78 is journaled in a bearing 81 secured to the frame work of the platform, and the shaft 79 is journaled in a bearing 82 which is secured to the legs 11.

The trays 16, positioned upon the loading platform 13, may be engaged by a cleat 83 which may comprise an angle iron suitably secured to the chain 75. A plurality of cleats may be provided, as found desirable, depending upon the dimensions of the trays.

For the purpose of moving the chain to effect a travel of the racks, a suitable ratchet wheel 84 is secured to the shaft 78 (see Fig. 4). The ratchet wheel 84 may be rotated intermittently by means of a ratchet arm 85 pivoted on the shaft 78 and disposed between a collar 86 pinned to the shaft and the ratchet wheel 84; and may be provided with a pawl 87 normally urged toward the ratchet wheel 84 by a spring 88 to engage one of the teeth thereof. One end of the ratchet arm 85 is provided with a link 89 which is pivoted to the arm 85 and to a rod 91. The rod 91 is pivoted to one arm of a lever 92 (see Fig. 2) the opposite end of which terminates in a treadle 93 so posi-

tioned as to be convenient for working by an operator attending the lamp-making machine. The lever 92 is fulcrumed in a bearing 94. A spring 95, secured to an end of the ratchet arm 85 and to the frame of the platform, serves to normally maintain the ratchet mechanism in an operative position.

It will be evident that a downward pressure of the treadle 93 will effect an upward movement of the rod 91, causing the latch on the ratchet arm to engage a tooth of the ratchet and move the ratchet wheel a given number of degrees about its axis, thereby causing a movement of the chain 75 to advance the trays or racks thereon. The ratchet mechanism and the movement of its operative parts may be so proportioned as to move the chain a distance equal to the space between a row of apertures and the rack. If the pitch of the spaces is varied, the ratchet mechanism may be changed to move the chain accordingly.

Where lamps are being deposited in a rack and a complete row has been filled, if desirable, the machine may be operated without advancing the tray to position another row for the reception of lamps. In this event, a suitable receptacle 96, (see Fig. 1) may be provided adjacent the tray, and any lamps that are transported by the carriers 52 will be ejected therefrom when they make contact with the end lamp positioned in the row of apertures, and the ejected lamp will be caused to roll or slide downwardly into the receptacle. It is obvious that a suitable guide or chute may be provided to assist in this operation. It has been found, however, that, by properly positioning the receptacle 96, a quantity of lamps may be accumulated therein without breakage.

After a carrier has deposited a lamp, it travels around one of the chain sprockets and, as indicated in Fig. 5, again passes under the element 19 to receive, transport and deposit another lamp.

In practice, the conveyor and depositing apparatus, as provided in the present invention, may be disposed in operative relation to a lamp-making machine. Lamps to be fed to the machine for certain operations may be supplied in the tray 17 which is positioned upon the unloading platform 12 and in convenient reach of an operator. An empty tray may also be positioned on the loading platform 13 in operative relation to the element 19 of the lamp-positioning mechanism. The operator may then feed lamps to the lamp-making machine. It is usually necessary to feed a plurality of lamps to the machine before they begin to be discharged therefrom. As the lamps are discharged from the lamp-making machine they are ejected individually and are received by the conveyor 22 which carries them to the inclined chute 42 down which they either slide or roll until they enter the element 19.

The lamps, upon reaching the aperture 46 of the element, are retained from passing therethrough by the enlarged portion of the lamp, the smaller portion of the lamp, however, enters the aperture and the lamp takes the position indicated in Fig. 3 and is then in position to be received by a carrier, the hook-members 64 of which move beneath the element 19 and slide the lamp along the aperture and out of the open end thereof. The carrier then deposits the lamp in an aperture of the rack by reason of the projection finger 71. In the meantime, the succeeding carrier conveys another lamp to operative relation with another aperture of the rack, and the lamp is deposited in this aperture by reason of its contact with the lamp already positioned which serves to eject the second lamp from the hook-member of the carrier. This operation is repeated until a plurality of apertures have been filled, preferably five, after which the operator depresses the treadle 93 to advance the tray and position another row of apertures in proper relation to the depositing mechanism.

It will be appreciated that, by the employment of a conveying and depositing mechanism, as provided by the present invention, a great saving of time is attained as well as a reduction in the breakage of lamps which may be incident to manual handling, as has heretofore been necessary.

Although a preferred embodiment of the invention has been described and illustrated, it is obvious that modifications may be made therein without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In combination, a conveyor and receiver, said receiver being so positioned with relation to said conveyor that articles in said receiver will engage with and remove articles from said conveyor.

2. In combination, a conveyor and a receiver, means adjacent to said receiver to remove an article from said conveyor, said receiver being so disposed that an article positioned therein will make contact with and remove an article from said conveyor.

3. In combination, a conveyor and a receiver, means disposed in operative relation to said conveyor to remove an article therefrom for deposit in said receiver, said receiver being so arranged with respect to said conveyor that an article positioned in the receiver will be disposed in the path of a portion of an article transported by said conveyor.

4. A tray-loading machine comprising a tray having apertures, means for adjusting a lamp to a vertical position, a conveyor for transporting said lamp to position adjacent to an aperture of said tray, a finger

for removing said lamp from said conveyor for deposit into said adjacent aperture.

5. A tray-loading device comprising a V-shaped trough for receiving and adjusting a bulb to a predetermined position, means for moving said positioned bulb and means for depositing said bulb in a tray.

6. A tray-loading machine comprising a tray for receiving lamp bulbs, a hopper provided with a longitudinal slot to receive the necks of lamp bulbs, a conveyor for automatically removing lamp bulbs from said slot and means for effecting a discharge of lamp bulbs from said conveyor.

7. A tray-loading machine comprising a tray for receiving articles, means for feeding articles, a V-shaped trough for automatically positioning articles for removal by said conveyor and means for depositing said articles in said tray.

8. A tray-loading machine comprising a tray, means for feeding fragile articles, a conveyor, a V-shaped trough for receiving and adjusting articles to vertical positions for removal by said conveyor, means for depositing said articles in a tray and means for moving said tray intermittently.

9. A tray-loading machine comprising means for feeding unsymmetrical glass articles and an element for receiving said articles having a V-shaped receptacle for adjusting said articles to predetermined positions.

10. A tray-loading machine comprising means for feeding lamp-parts, an element for receiving said parts and having a trough shaped element for adjusting said parts to predetermined positions and means for removing said parts from said element.

11. A tray-loading machine comprising means for feeding fragile articles, a stationary element for receiving articles and having gravitational means for adjusting said articles to predetermined positions, means for removing said articles from said element and means for depositing said articles in a tray.

12. A tray-loading machine comprising means for feeding fragile articles, a V-shaped receptacle for receiving articles and having gravitational means for adjusting said articles to predetermined positions, means for removing said articles from said elements, means for depositing said articles in a tray and means for moving said tray intermittently.

13. A tray-loading machine comprising means for feeding fragile articles, a hopper for receiving said articles, inclined surfaces associated with said hopper for effecting the adjustment of said articles to predetermined positions, a conveyor disposed in operative relation with said hopper for removing articles therefrom, and means for removing said positioned articles from said conveyor.

14. A tray-loading machine comprising means for feeding fragile articles, a receptacle for receiving said articles, a slot longitudinally of said receptacle, inclined surfaces associated with said receptacle for effecting the adjustment of said articles to predetermined positions in said slot, means for removing said positioned articles from said conveyor and means for depositing said articles in a tray.

15. A tray-loading machine comprising a tray means for feeding fragile articles, a receptacle for receiving said articles, means integral with said receptacle for effecting the adjustment of said articles to predetermined positions, means for removing said positioned articles from said receptacle, means for depositing said articles in a tray and means for moving said tray intermittently.

16. A tray-loading machine comprising a tray having a plurality of apertures therein, means for feeding lamp bulbs, a receptacle for receiving said bulbs, inclined surfaces integral with said receptacle and arranged in parallel relation at their edges to provide a slot for the disposition of the necks of lamp bulbs, a conveyor for engaging said bulbs for removal from said slot and means for automatically positioning bulbs successively in apertures of said tray.

17. A portable tray-loading machine comprising a platform for supporting a tray, an article conveyor adapted for disposition in operative relation to an article producing machine, an article adjusting device associated with said conveyor and means adjacent said device for transporting articles therefrom for deposit in a tray supported upon said platform.

18. A tray-loading machine comprising a platform, a supporting frame, an article conveyor projecting therefrom and adapted to be positioned in operative relation to an article producing mechanism, a hopper associated with said conveyor to receive articles removed thereby and adjust the articles to predetermined positions, means adjacent to said hopper for removing articles therefrom and transporting said articles for disposition in a tray positioned on said platform.

19. A device for loading a tray with incandescent electric lamps comprising a tray having a plurality of apertures spaced at intervals, a receptacle to receive lamps, conveyor mechanism for moving lamps from a lamp-making machine to said receptacle, means integral with said receptacle for positioning lamps for disposition in said tray and means for automatically positioning lamps in apertures of said tray.

20. A device for loading a tray with incandescent electric lamps comprising a tray having a plurality of apertures spaced at

intervals, a receptacle having means integral therewith for vertically adjusting lamps deposited therein, means for automatically transporting a lamp from a lamp-making machine to said receptacle and means for successively positioning lamps in each of a row of apertures in said tray.

21. A tray-loading device comprising a tray having a plurality of apertures spaced at intervals, a trough-shaped receptacle adapted to receive and adjust lamp bulbs to vertical positions, means for automatically transporting an electric incandescent lamp from a lamp-making machine to said receptacle, means for successively removing lamp bulbs from said receptacle and positioning the lamps in each of a row of apertures in said tray and means for moving said tray to dispose another row of apertures in operative relation to said lamp positioning means.

22. A machine for depositing electric incandescent lamps in a tray comprising a tray having a plurality of apertures, means for transporting a lamp from a lamp-making machine, a trough-shaped hopper for positioning said lamp with its longitudinal axis in a vertical position, means for moving said lamp to a position over an aperture in said tray and means for causing said lamp to be deposited in said aperture.

23. A machine for depositing electric incandescent lamps in a tray comprising a tray having a plurality of apertures, means for transporting a lamp from a lamp-making machine, a hopper having inclined walls for positioning said lamp with its longitudinal axis in a vertical position, means for moving said lamp to a position over an aperture in said tray, means for maintaining said axis in said vertical position during said movement and means for depositing said lamp in said aperture.

24. In a tray-loading device, comprising means for adjusting electric incandescent lamp bulbs to predetermined positions, said means including a hopper having an opening at its lower end and having the walls thereof positioned in such relation as to cause a lamp entering therein to project its smaller end through said opening.

25. In a tray-loading device, the combination with an element for adjusting electric incandescent lamp bulbs to predetermined positions, said element comprising a pair of inclined side plates positioned to form a trough shaped receptacle open at the lower end and adapted to permit the smaller end of a lamp entering said receptacle to depend from said opening and means for removing said lamp from said receptacle.

26. In a tray-loading machine, the combination of means for conveying an electric incandescent lamp from a lamp-making machine, a hopper for receiving said conveyed lamp, means integral with said hopper to effect a movement of said lamp about its greater transverse axis to position the lamp with its longitudinal axis vertical.

27. A tray-loading machine comprising means for supporting a tray having a plurality of apertures, means for transporting a lamp adjacent said apertures, means for engaging a transported lamp to cause the lamp to enter one of said apertures and means for moving a second lamp in contact with said positioned lamp to cause the said second lamp to be guided to position in one of said apertures.

28. A tray-loading machine comprising means for supporting a tray having lamp receiving apertures therein, a lamp carrier for transporting a lamp in given relation to one of said apertures and a finger for engaging with a transported lamp to remove said lamp from said carrier and for causing said lamp to enter one of said apertures.

29. A tray-loading machine comprising means for supporting a tray having a plurality of apertures therein, a conveyor for moving a lamp in a given relation to said apertures, means for positioning a lamp in one of said apertures, said conveyor being so arranged that a portion of the lamp carried thereby will engage with a lamp positioned in one of said apertures to cause the transported lamp to be deposited in an adjacent aperture.

30. A tray-loading machine comprising a tray having apertures therein, means for conveying and depositing a lamp in one of said apertures, said tray being so disposed with respect to said conveying means as to cause a conveyed lamp and a positioned lamp to engage to unseat the conveyed lamp from the conveyor, said apertures being so disposed that the said unseated lamp will enter an aperture in the tray adjacent to the deposited lamp.

31. A tray-loading machine comprising means for supporting a tray having a plurality of apertures, means for transporting a lamp adjacent said apertures, means for causing a removal of a lamp from said transporting means to position in one of said apertures, means for moving a second lamp in contact with said positioned lamp to cause the said second lamp to be guided to position in one of said apertures and means for advancing the tray to change the relative positions of the apertures and the transporting means.

32. A tray-loading machine comprising means for supporting a tray having lamp receiving apertures therein, a lamp carrier for transporting lamps in given relation to one of said apertures, a finger disposed adjacent to said apertures for removing said lamp from said carrier for causing said

lamp to enter one of said apertures and means for moving said tray to change the position of said apertures with respect to said carriers.

33. A tray-loading machine comprising means for supporting a tray having a plurality of apertures therein, means for conveying a lamp in a given relation to said apertures, a finger disposed in the path of a conveyed lamp to engage therewith to position a lamp in one of said apertures, said conveying means being so disposed with relation to the positioned lamp that said lamp may engage with another lamp moved by said conveyor to be deposited in an adjacent aperture and means for moving said tray after a plurality of said apertures have had lamps positioned therein.

34. A tray-loading machine comprising a tray having apertures therein, means for conveying lamp bulbs, a finger for engaging a conveyed bulb to effect a deposit of said bulb in one of said apertures, said tray being so disposed with relation to a conveyed lamp and a lamp positioned in an aperture of said tray, whereby said conveyed lamp will become unseated from said conveyor and enter an aperture of the tray and means for moving said tray to position another aperture in operative relation to said conveyor.

In testimony whereof, I have hereunto subscribed my name this 20th day of July 1922.

HARRY DE FOREST MADDEN.