

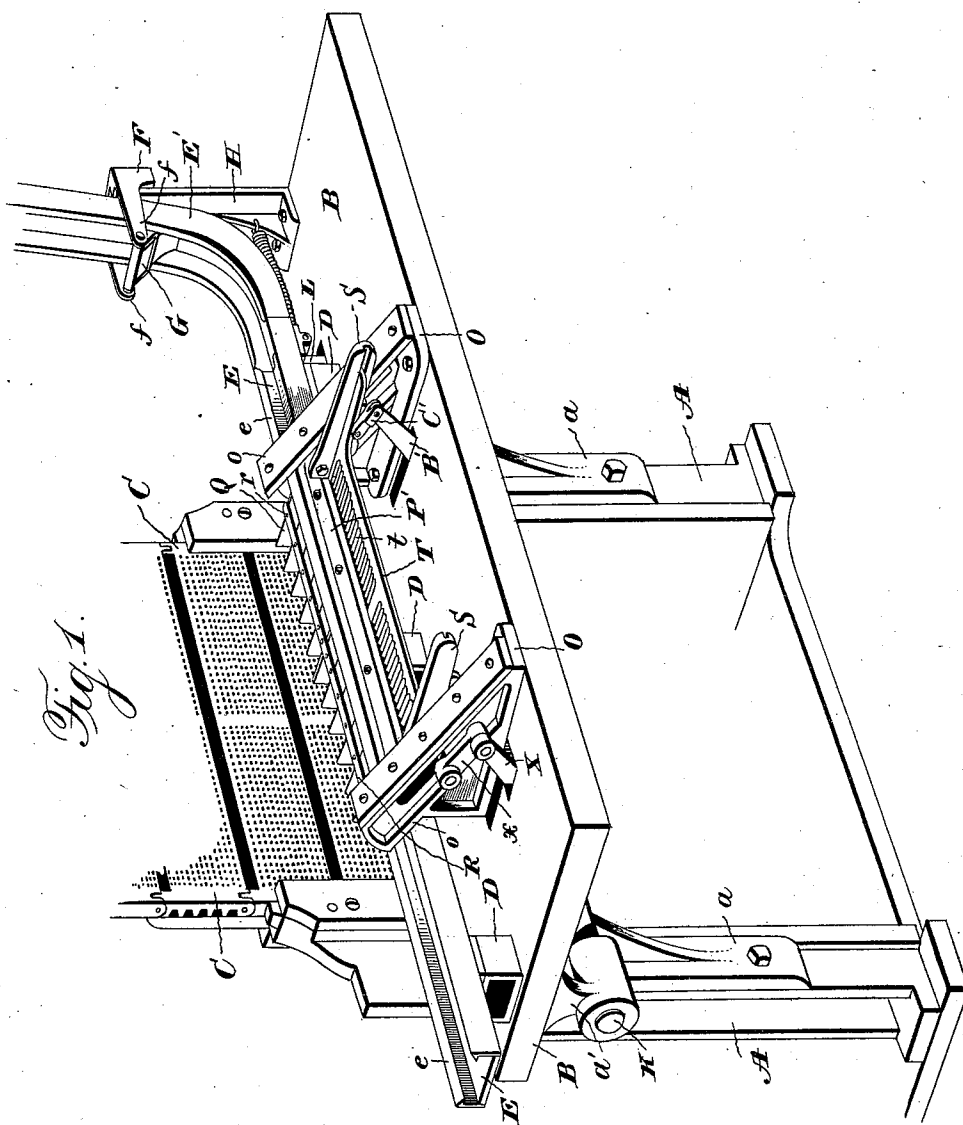
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5 Sheets—Sheet 1.

C. H. PALMER & J. W. DENMEAD.
BOX FILLING MACHINE.

No. 549,388.

Patented Nov. 5, 1895.



Witnesses:
Jas. C. Hutchinson
Henry C. Hazard

Inventors:
Chas. H. Palmer and J. W. Denmead, by
Crindle and Russell, their Attys

(No Model.)

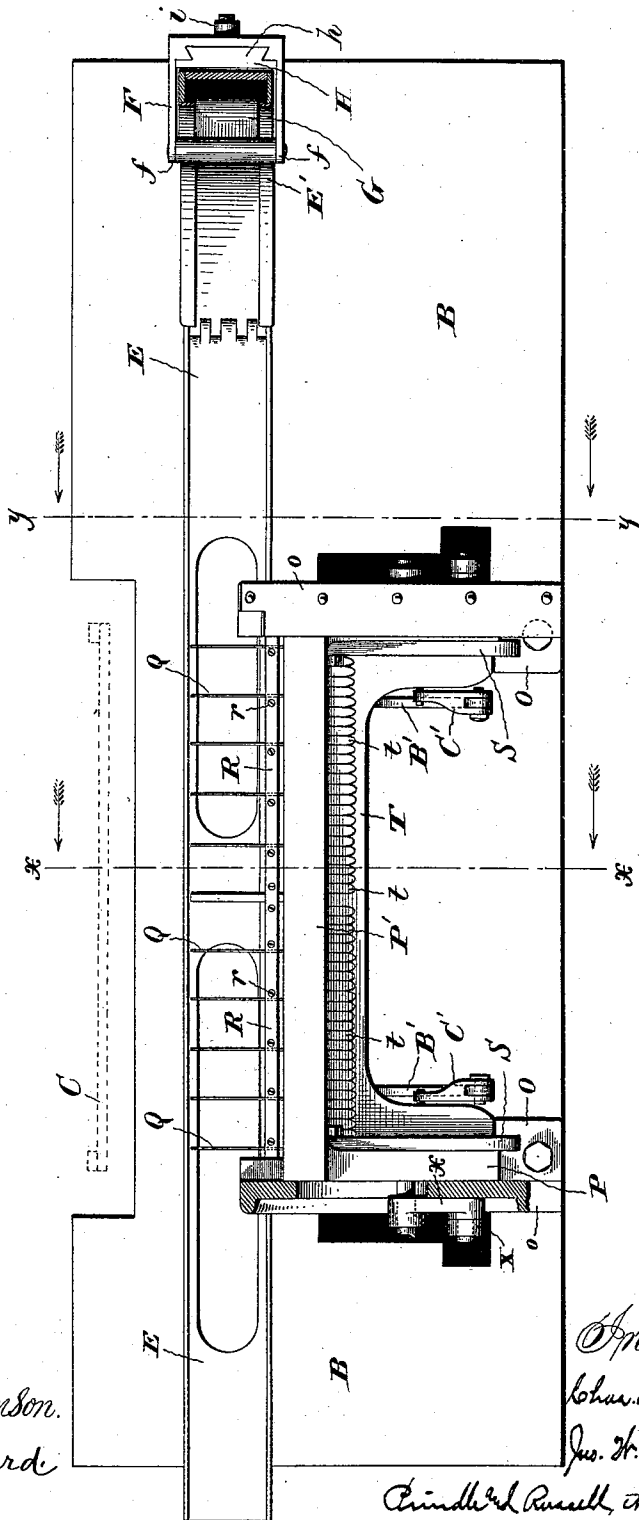
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Fig. 2.



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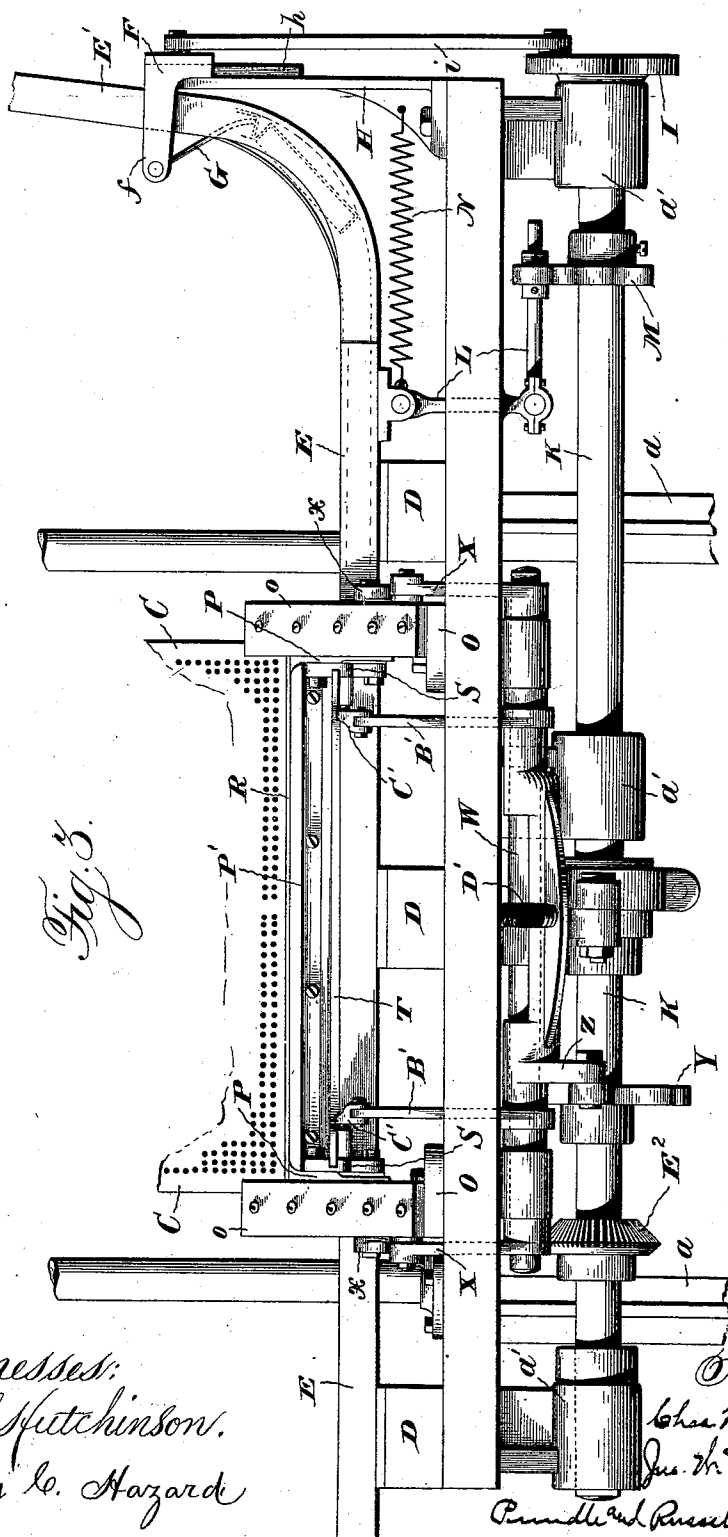
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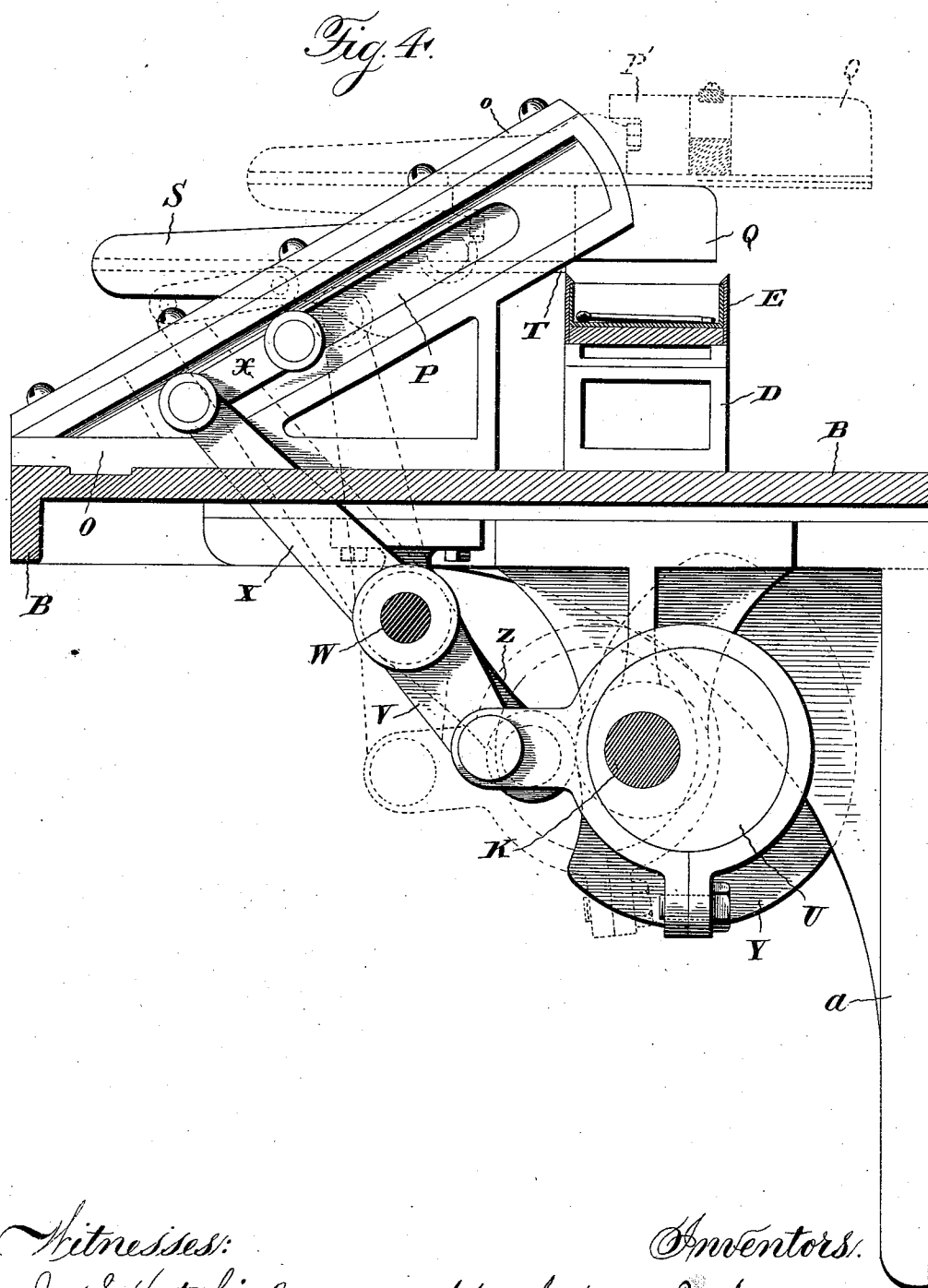
(No Model.)

5 Sheets—Sheet 4.

C. H. PALMER & J. W. DENMEAD.
BOX FILLING MACHINE.

No. 549,388.

Patented Nov. 5, 1895.



Witnesses:

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(No Model.)

5 Sheets—Sheet 5.

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BOX FILLING MACHINE.

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Fig. 5.

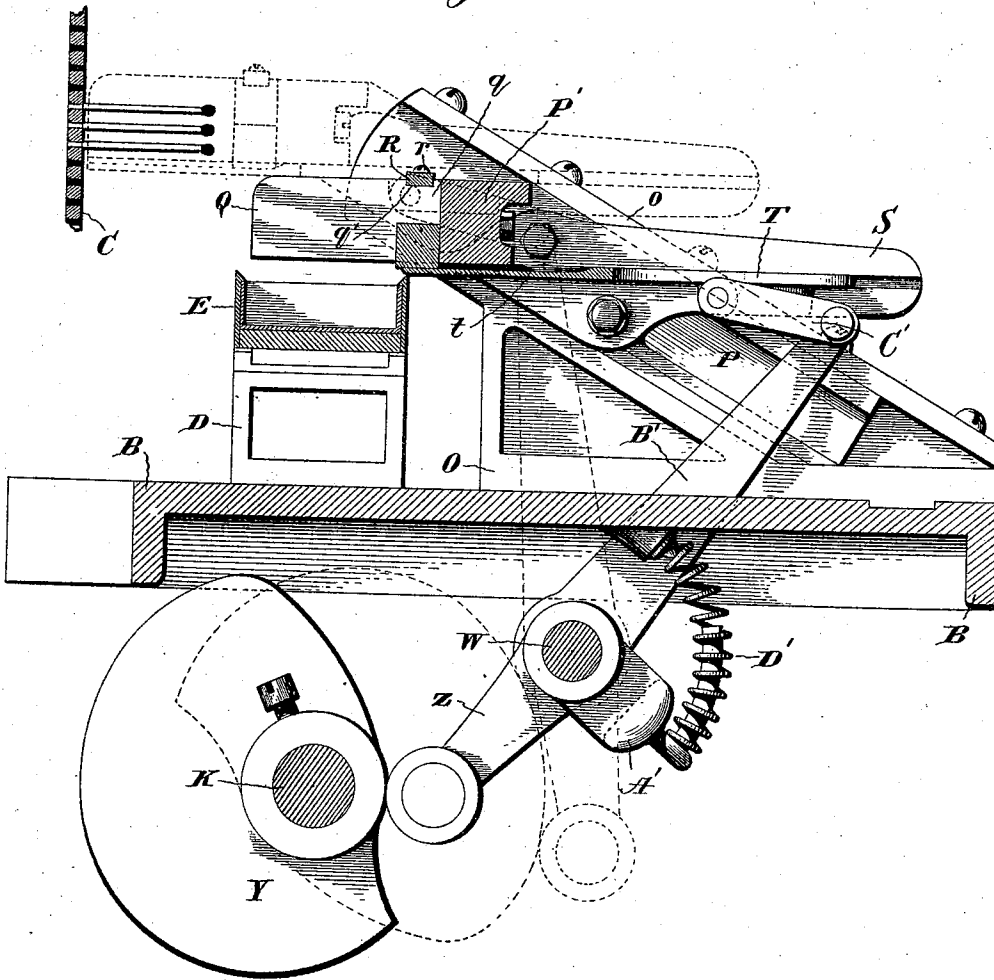
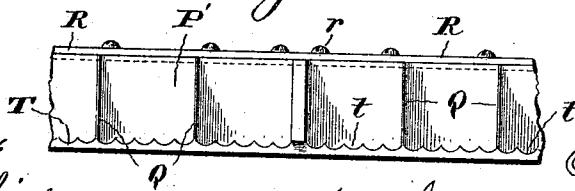


Fig. 6.



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Charles Russell, their atty.

UNITED STATES PATENT OFFICE.

CHARLES H. PALMER AND JOHN W. DENMEAD, OF AKRON, OHIO, ASSIGNORS
TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS.

BOX-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,388, dated November 5, 1895.

Application filed December 6, 1894. Serial No. 531,002. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. PALMER and JOHN W. DENMEAD, of Akron, in the county of Summit, and in the State of Ohio, have invented certain new and useful improvements in Box-Filling Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of our machine; Fig. 2, a plan view thereof with parts in section; Fig. 3, a front elevation of said machine. Figs. 4 and 5 are, respectively, sections on lines *xx* and *yy* of Fig. 2; and Fig. 6, a detail rear elevation of a portion of the match receiving and conveying mechanism.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to enable matches to be successfully placed in boxes by mechanical means directly from the match-making machine; and to this end said invention consists in the mechanism and in the construction and combination of the parts thereof, substantially as and for the purpose hereinafter specified.

To illustrate our invention we will show and describe it as employed in connection with the well-known form of match-machine which is known as the "continuous" machine, and an example of which is shown in United States patent to E. B. Beecher and J. P. Wright, No. 528,457, of October 30, 1894; but we of course do not limit ourselves only to the use of our invention in connection with such machine, nor in fact to any particular construction of match-machine.

In the type of machine referred to the match-splints, after being cut, are stuck into openings in plates that are flexibly united into an endless chain, which, after carrying them to the devices for applying paraffine and the igniting composition, eventually returns them to a point near which the splints are cut, at which point they are discharged from the machine by being punched from the chain-plates.

In the carrying of our invention into practice we attach to the frame A of the match-

machine, by means of brackets *a* and *a*, a horizontally-arranged base-plate or support B, that is located a suitable distance below the point where the matches are punched from the chain-plate C, and extends entirely across the end of the machine.

Upon the upper side of said plate are secured several blocks D and D, that form bearings or supports for a vibrating trough or way E, which extends crosswise of the machine. Into and through said trough, which has on each side an inwardly-projecting box-engaging flange *e*, match-boxes are passed from a suitable source of supply, the connection with the latter and said trough being a chute E, that has a downwardly-inclined portion through which the boxes descend by gravity, and a horizontal portion that is in alignment with the trough, the chute between the inclined and horizontal portions being rounded or curved, as shown. Said chute has on the upper edge of each side an inwardly-projecting flange to keep the boxes from accidental displacement as they pass along through the same.

The boxes are moved through the horizontal portion of the chute into and through the trough or way E by means of a feeding device of any desired construction. That shown consists of a vertically-reciprocable slide-block F, that has forwardly-projecting arms *f* and *f*, between which is pivoted a pawl-like plate G, whose free end reaches into the curved portion of the chute, where it can engage the ends of the boxes and move the latter forward as the slide-block F descends. Said slide-block is guided by a way *h* upon the side of a standard H, that is secured to the plate A, and it is moved from an eccentric or crank-disk I upon a shaft K, which is supported in boxes *a'* and *a'* beneath the plate A, the connection between the crank-disk and slide-block being a rod or pitman *i*.

To insure the proper filling of the boxes with matches, the trough E is made to vibrate rapidly in a longitudinal direction to cause the matches to settle and pack closely in the boxes.

Any suitable mechanism for accomplishing this result may be employed, but a very good

means of doing it is that shown, which consists of a bell-crank lever L, pivoted in boxes upon the under side of the plate A, and having one arm passing up through a slot in said plate A and connected with the under side of the trough, and the other arm engaging the periphery of a cam-wheel M, that is mounted upon and rotates with the shaft K. A coiled spring N, connected to the lever L, operates to move the same and the trough in opposition to the cam-wheel.

Screwed or otherwise fastened upon the upper side of the plate A are two plates O and O, each of which upon its inner side is provided with a guideway *o*, that inclines at an angle of about thirty degrees from a horizontal plane upward toward the match-carrying plates C. Guided by said ways is a reciprocating frame composed of a side bar P, mounted in each way and a horizontal bar P' connecting the upper ends of the two side bars.

Projecting from the side of the bar P' toward the match-carrier C there are numerous very thin plates Q Q, whose purpose will be hereinafter described, which are secured to the bar P' by having each a projection *q*, that enters a slit in said bar, and which is engaged and clamped upon its upper edge by a flat rod or strip R, that has such length as to engage the projections *q* of all of the plates Q. Said rod is held in place by screws *r* and *r*, there being one of the latter located quite close to each plate Q, and is preferably seated within a notch *q'* in the edge of the projection *q*.

Mounted in guides S and S upon the inner sides of the bars P and P, at the bottom of the cross-bar P', is a horizontally-sliding plate T, that is adapted to be projected into position beneath the plates Q and Q, so as to constitute the bottom of a series of receptacles or compartments, whose sides are formed by said plates Q and Q, and to be withdrawn wholly from beneath said plates. Said plate T is designed to receive the matches as they are discharged from the machine and to convey them to boxes passing through the trough E, and together with the bar carrying plates Q and Q travel back and forth from a position to receive the matches to one over the boxes, and in addition to such movement has a further movement from beneath the partition-plates Q and Q to permit the matches to fall into the boxes.

The reciprocation of the frame composed of bars P, P, and P' is produced from an eccentric U, upon the shaft K, that is connected to one end of an arm V, that is attached to a rock-shaft W, which is supported in bearings beneath the plate A, and to which shaft there are secured two arms X and X, each of which is connected by a link *x* with one of the side bars P.

The movements of the plate T are effected through a cam Y, mounted upon said shaft K', which co-operates with an arm Z, that is attached to a yoke or frame A', pivoted upon

the shaft W, so that it may move independently of said shaft, and to which yoke are secured two arms B' and B', each of which is connected by means of a link C' with one side of the plate T. A coiled spring D', having one end bearing against the yoke A' and the other against an adjacent part of the plate A, operates to move the plate T in opposition to the cam and causes the arm Z to bear yieldingly against the cam Y. The shape of the latter is such that before or at the time the frame P, P, and P' reaches its raised position said plate T will have been projected beneath the partition-plates Q and Q, and will then be lowered in unison with said frame, without moving relative thereto, until such frame reaches its lower limit of motion, whereupon said plate T will be suddenly moved in its ways from beneath the partition-plates Q and Q.

To insure that the matches dropping upon the plate T will be in parallel lines in an orderly manner the upper side of said plate is provided with adjoining parallel concave grooves *t* and *t*, and that said plate may closely fit the under side of the bar P', to prevent matches passing under the latter as the plate T is withdrawn from beneath them, the under surface of said bar is grooved in correspondence with the grooving of the upper side of the plate T.

The shaft K, from which all moving parts are given motion, may be driven in any suitable way from any source of power; but we prefer to gear it to some suitable shaft of the match-machine, and for this purpose mount upon said shaft K a bevel gear E'.

The operation of our machine is as follows: The boxes to be filled being passed down the chute to the feeding device, the latter causes them to move end to end in a continuous procession through the vibrating trough E. By the time the matches are ready to be punched from the carrier plates the transferring mechanism, consisting of the plate T and the series of compartments formed by the partitions Q and Q is advanced in position to receive them as they fall, and preferably three rows of matches are removed from the carrier at a time. Guided by the partitions Q and Q, which are spaced a distance apart less than the length of a match, the matches are prevented from falling sufficiently away upon the grooved surface of the plate T to avoid being adjusted by the grooves *t* and *t* into orderly parallel position. Having received the matches, the plates and partitions move simultaneously away from the carrier to a point directly over the boxes in the trough, when the partitions cease their travel, and the plate is suddenly withdrawn from beneath the matches and the same thus dropped into the boxes beneath, where, by the vibrations of the trough, they are closely settled or packed. The movements of parts are so timed that the transfer mechanism makes enough trips to and from the carrier-plate

during the time a box is passing across the match-receiving field to insure the filling thereof. After its discharge from the trough the fielded box is supplied with the usual
5 cover or slide.

Having thus described our invention, what we claim is—

1. In combination with the splint holder of a match machine by which the splints are supported for dipping, a box support, a carrier, receiving matches directly from said holder, and means for emptying matches from said carrier directly into a box, substantially as and for the purpose specified.

2. In combination with the splint holder of a match machine by which the splints are supported for dipping, a box support, a carrier having a horizontal receiving surface to which matches are discharged directly from said
15 holder and means for discharging matches from the carrier directly into a box, substantially as and for the purpose shown.

3. In combination with a source of supply of matches, a box support, a carrier moving to and fro between the latter and said source of supply in a straight line, and means to discharge the matches therefrom into a box, substantially as and for the purpose set forth.

4. In combination with a source of supply of matches from which the latter are delivered in a horizontal position, a box support, and a carrier having a horizontal receiving surface, and movable to and fro between the source of supply and the box support, and
30 means for discharging matches from the carrier into a box, substantially as and for the purpose described.

5. In combination with a source of supply of material to be boxed, a box support, a carrier having a horizontal sliding bottom, and movable to and fro between the source of supply and the box support in a straight line, and means to slide said bottom to discharge the material upon it into a box, substantially as and for the purpose set forth.

6. In combination with the splint holder of a match machine, by which the splints are supported for dipping, a way along which boxes are passed, a match carrier receiving matches directly from said holder, and means for discharging matches from the carrier into the passing boxes, substantially as and for the purpose described.

7. In combination with a source of supply of matches, a support for boxes, means to vibrate the boxes in a direction at a right angle to the length of the matches as they are to lie in the box, a match carrier movable to and fro between the box support and the
60 source of supply, and means to discharge matches therefrom into the boxes, substantially as and for the purpose set forth.

8. In combination with a source of supply of matches, a trough through which boxes are passed, means for vibrating said trough in the direction of travel of boxes therethrough, and a match carrier movable to and fro be-

tween the trough and said source of supply, and adapted to discharge the matches into the passing boxes, substantially as and for
70 the purpose specified.

9. In combination with a source of supply of matches, a trough through which boxes are passed end to end, means for vibrating said trough in the direction of travel of boxes
75 therethrough, a carrier having a sliding bottom, and movable to and fro between the source of supply and the trough, and means to slide said bottom to discharge the matches into the boxes, substantially as and for the
80 purpose shown.

10. In combination with a source of supply of matches, a match carrier composed of a reciprocable frame moving in a straight line, and a sliding plate mounted in guide ways in
85 said frame, substantially as and for the purpose specified.

11. In combination with a source of supply of matches, a match carrier composed of a frame, that reciprocates in inclined guides,
90 and a horizontal sliding match receiving plate which is carried by said frame, substantially as and for the purpose set forth.

12. In combination with a source of supply of matches, a match carrier having a sliding
95 bottom, an eccentric for reciprocating said carrier, and a cam for controlling the movement of the carrier bottom, said eccentric and cam being upon the same shaft, substantially as and for the purpose described.

13. In combination with a source of supply of matches, a match carrier having a sliding
100 bottom, a rock-shaft having arms connected with said carrier, an eccentric for rocking the shaft, the arms connected with the sliding
105 bottom, and mounted loosely upon the rock shaft, and a cam for controlling the movement of said arms, substantially as and for the purpose specified.

14. In combination with the splint holder
110 of a match machine by which the splints are supported for dipping, a box support, a carrier receiving matches directly from said holder and having its match receiving face grooved, and means for emptying matches
115 from the carrier into a box, substantially as and for the purpose shown.

15. In a match carrier, the combination of a holder from which matches are delivered in a horizontal or substantially horizontal position, a bar having a series of division plates projecting from it, and a movable plate forming the carrier bottom, a number of compartments being thus formed that are open at one side and the top, substantially as and for the
125 purpose set forth.

16. In a match carrier, the combination of a holder from which matches are delivered in a horizontal or substantially horizontal position, a bar having a series of division plates
130 projecting from one side and a bottom that, with said plates forms a series of compartments open at one side and the top, substantially as and for the purpose described.

17. In a match carrier, the combination of
a holder from which matches are delivered in
a horizontal or substantially horizontal posi-
tion, a bar having a series of division plates
5 projecting from one side, and a bottom that
is grooved upon its upper side, said plates
and bottom forming a series of compartments
open at one side and the top, substantially
as and for the purpose specified.

In testimony that we claim the foregoing 10
we have hereunto set our hands this 30th day
of November, 1894.

CHARLES H. PALMER.
JOHN W. DENMEAD.

Witnesses:

THOS. F. WALSH,
CHAS. C. BENNER.