

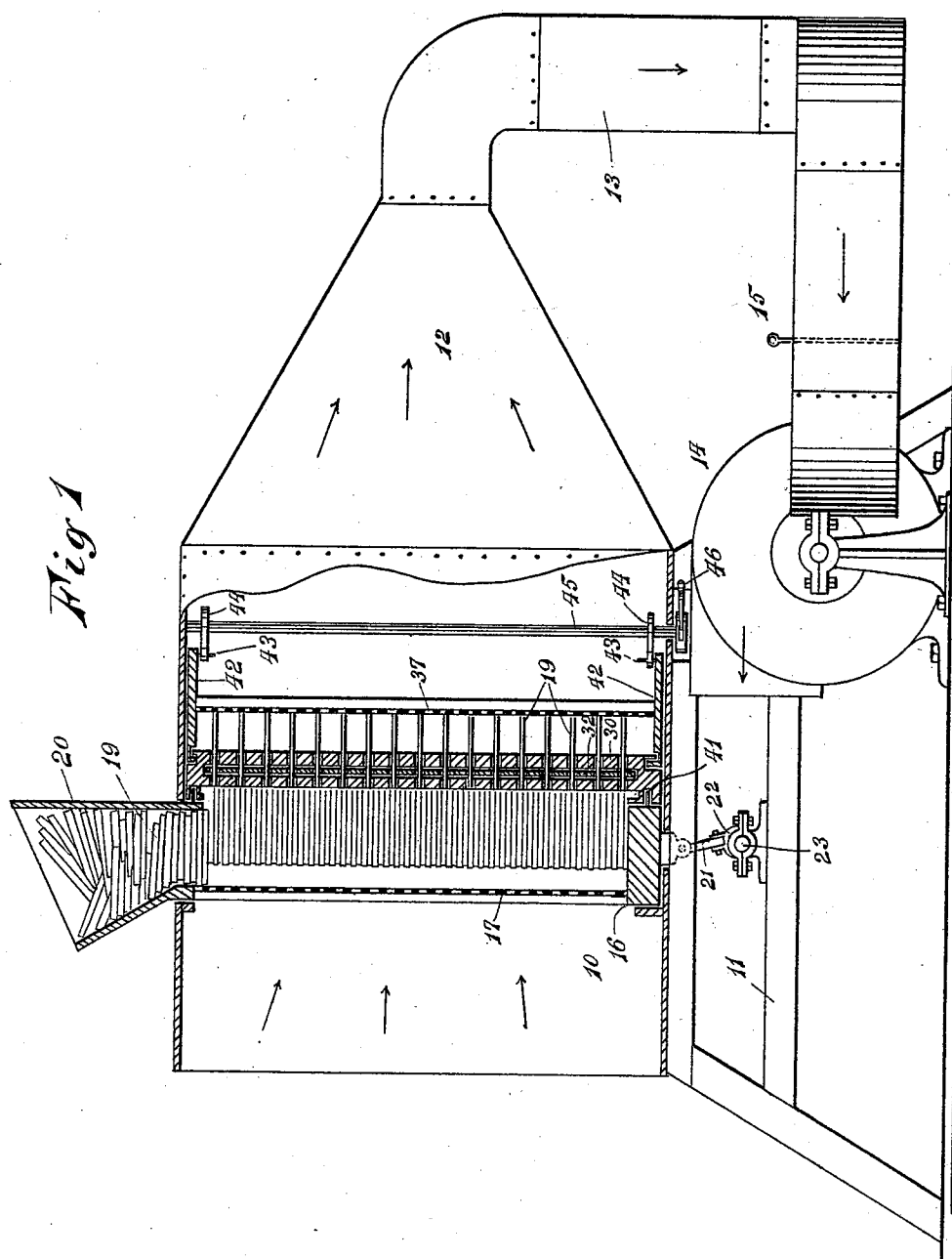
(No Model.)

4 Sheets—Sheet 1.

W. F. HUTCHINSON.
MACHINE FOR ASSEMBLING MATCH SPLINTS.

No. 544,538.

Patented Aug. 13, 1895.



WITNESSES:

Gertram H. Saunders
W. A. Filkins

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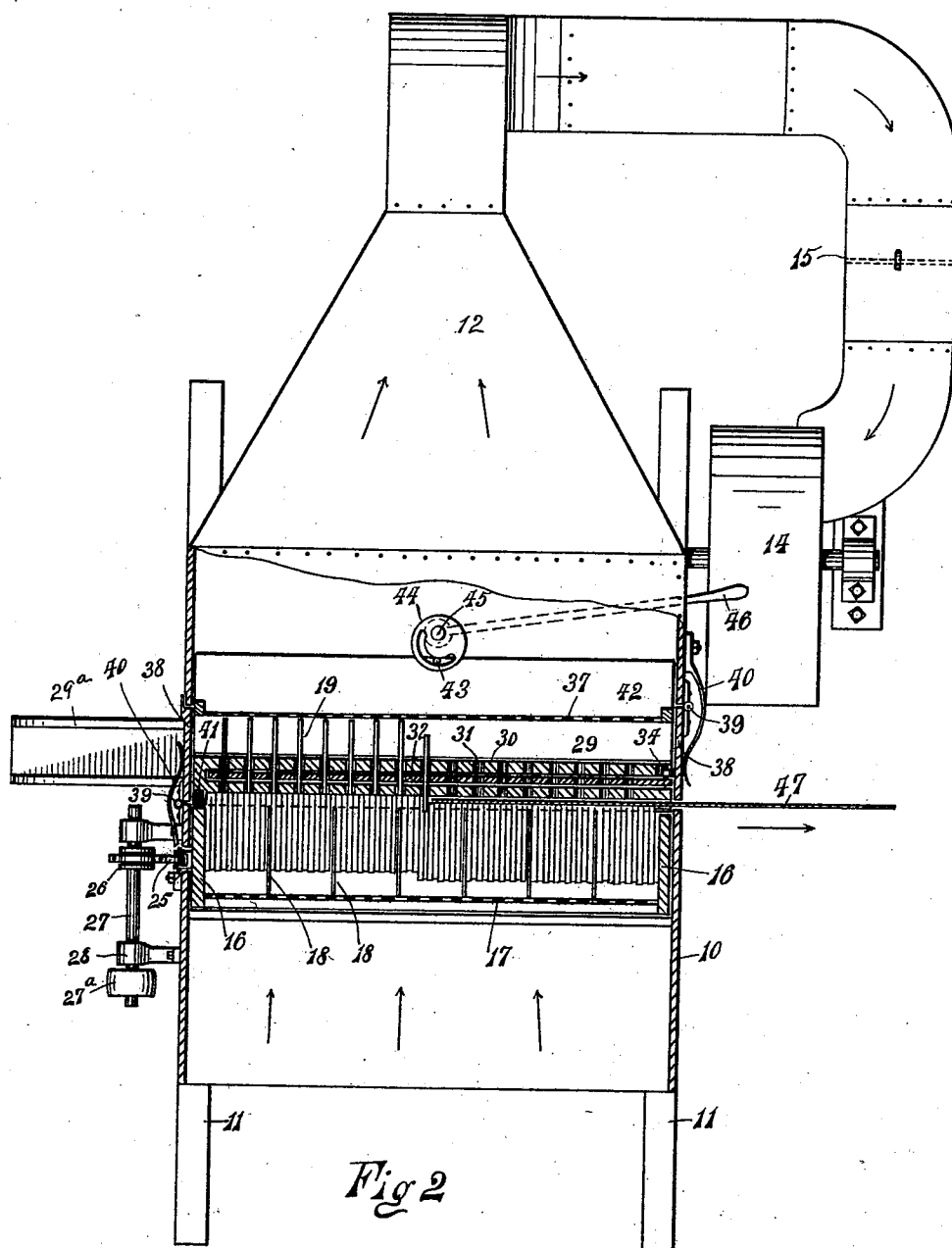
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4 Sheets—Sheet 2.

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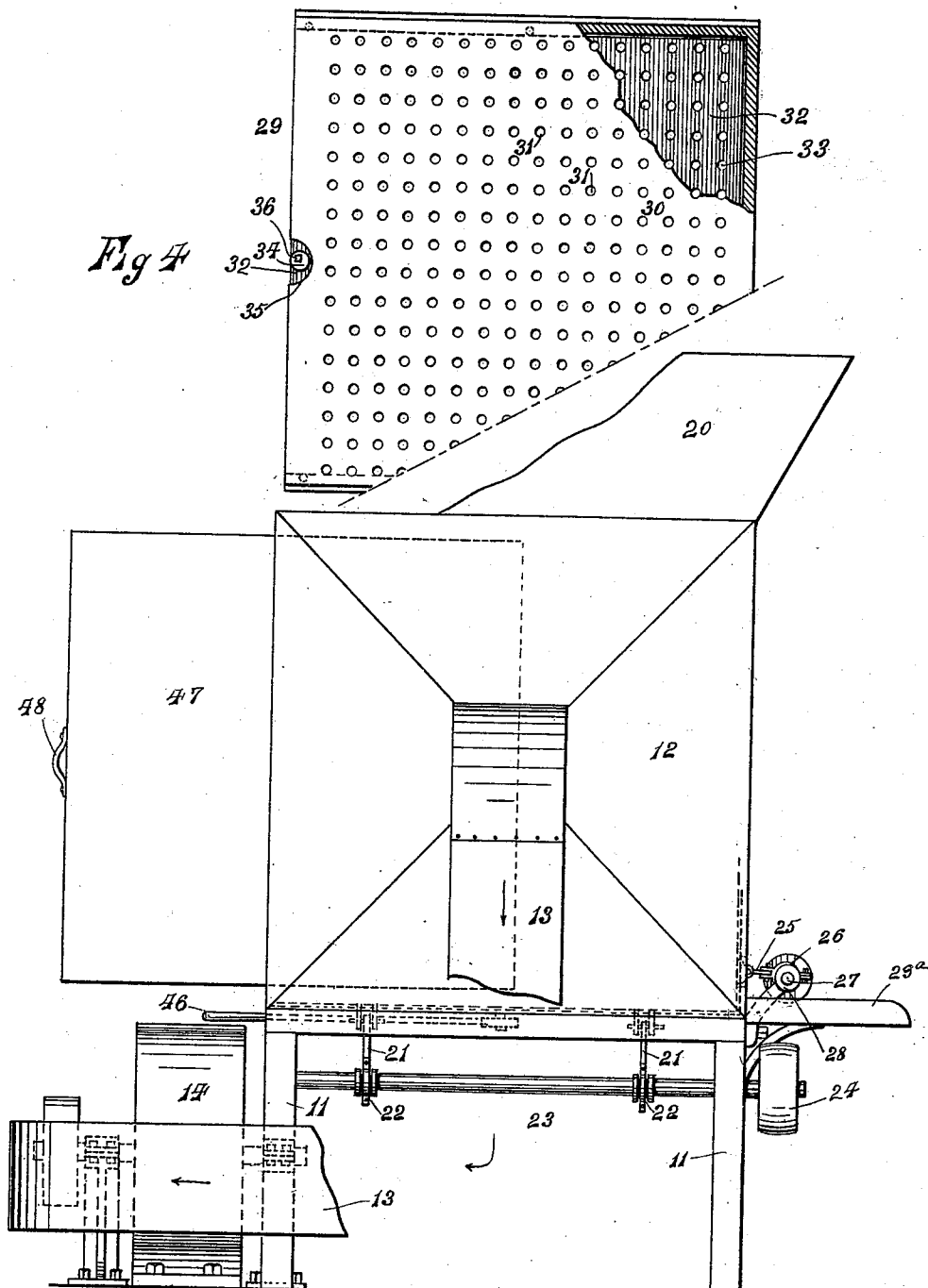
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Fig 3

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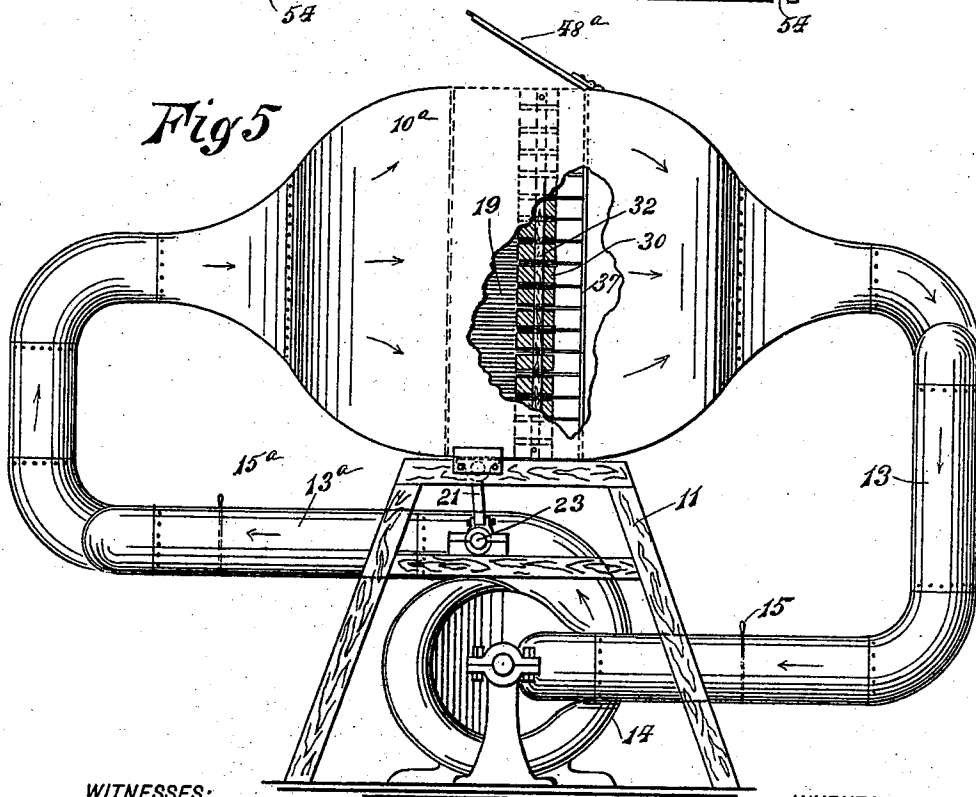
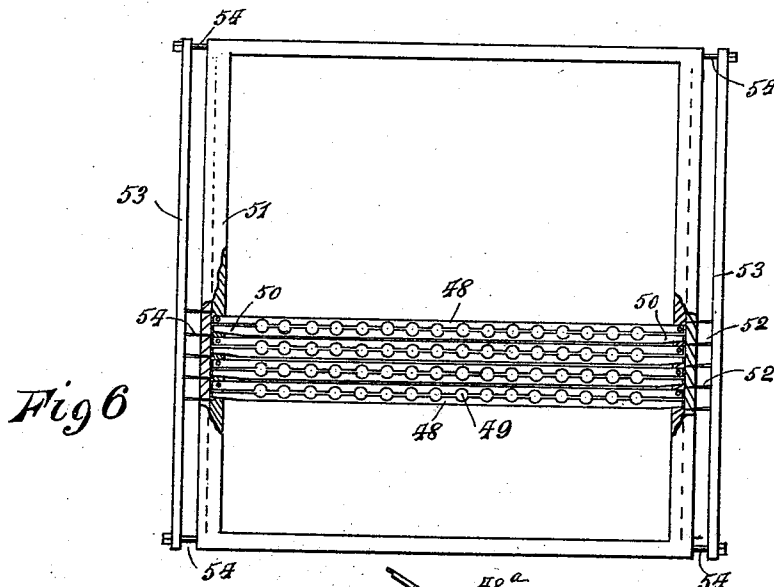
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4 Sheets—Sheet 4.

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UNITED STATES PATENT OFFICE.

WILLIAM F. HUTCHINSON, OF NEW YORK, N. Y.

MACHINE FOR ASSEMBLING MATCH-SPLINTS.

SPECIFICATION forming part of Letters Patent No. 544,538, dated August 13, 1895.

Application filed April 1, 1895. Serial No. 544,000. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM F. HUTCHINSON, of the city, county, and State of New York, have invented new and useful Improvements in Machines for Assembling Match-Splints, of which the following is a full, clear, and exact description.

In the manufacture of matches it is necessary to assemble the splints or sticks in such a way that they may be conveniently dipped in the preparation which forms the head of the matches; and the object of my invention is to produce an improved method of accomplishing this purpose, which method is intended to assemble the splints very rapidly and nicely, and which utilizes pneumatic force to place the splints in position; also, to produce a simple, convenient, and efficient apparatus by means of which my method may be carried into effect.

In carrying out my invention the splints may be either sucked into the gripping device in which they are held by exhausting the air from the case containing the gripping device, or they may be blown into the said gripping device, or the two principles may be combined, a suction being exerted on one end of the splints and the air being blown against the opposite end, thus forming a current of air, which quickly drives or carries the splints into the gripping device. When the splints are assembled into the gripping device, the latter can be handled, so that the ends of the assembled splints may be quickly and nicely dipped.

With these ends in view my invention consists of an apparatus for assembling match-splints, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation, partly in vertical longitudinal section, of the apparatus which I employ in carrying out my improved method. Fig. 2 is a sectional plan view of the apparatus. Fig. 3 is a broken end view of the assembling apparatus. Fig. 4 is a broken front elevation, partly in section, of a preferred form of gripping device to hold the assembled splints. Fig. 5 is a broken side

elevation, partly in section, of a slightly-modified form of the apparatus, which utilizes a continuous current of air for assembling the splints, the air being exhausted from one end of the assembling-case and forced into the opposite end; and Fig. 6 is a front elevation, partly in section, of a modified form of gripping device to hold the splints.

In carrying out my method I provide a casing 10, which is open at one end and is supported on a suitable framework 11, the case having one end tapered, as shown at 12, and connected by means of a pipe 13 with an exhaust-fan 14, the pipe being controlled by a suitable damper or valve 15. It is of course obvious that this casing may be made of any necessary shape or size and connected with any ordinary exhaust-fan without affecting the principle of the invention.

Arranged transversely in the casing 10 is a box 16, which is arranged preferably so that it can be shaken or vibrated, as this facilitates assembling the splints, and this box is open in front, but has its back formed of a screen 17, which prevents the displacement of the splints, but permits the air to pass through the box, so as to assemble the splints in the gripping device to be presently described. This box 16 is preferably provided with a series of parallel vertical partitions 18, which are placed near enough together to prevent the splints from turning between them, and thus the splints when dropped into the box are held in a substantial and parallel position.

The splints 19 may be fed into the box 16 in any approved way; but this is preferably done by means of a suitable hopper 20, which is supported above the casing 10, and which, as illustrated, forms a part of the box 16.

In carrying out my method the box 16 is preferably vibrated, and this may be accomplished in any convenient manner, the means illustrated being suitable and showing links 21 connecting the bottom of the box 16 with eccentrics 22 on a shaft 23, which is journaled on the framework 11 of the device and provided with a driving-pulley 24. I have also shown means for vibrating the box 16 from the side, and to this end it is connected by a link 25 with an eccentric 26 on the shaft 27, which is provided with the driving-pulley

27^a and is journaled in brackets 28 on one side of the casing 10, as shown in Figs. 2 and 3.

When the splints are drawn forward from the box 16 they are caught and held in the gripping device 29, a preferred form of which is shown in Fig. 4. This gripping device is adapted to extend transversely across the casing 10, opposite the box 16, and it comprises two outer parallel plates 30, which are provided with perforations 31 large enough to easily receive the match-splints and are preferably connected at three edges to form a casing, while between these plates 30 is a third plate 32, having perforations 33 adapted to register with the perforations 31 of the plates 30. At one edge of the plate 32 is a cam 34, which is adapted to engage an oppositely-curved edge 35 of a plate 30, (see Fig. 4,) and to enable the cam to be turned readily it is provided with a wrench-head 36.

It will be seen that when the splints are drawn through the perforations 31 and 33 the cam 34 may then be turned, so as to draw outward the plate 32, and this causes the walls of the perforations 33 to bear against the match-splints hard enough to bind them between the plate 32 and the walls of the perforations 31 of the plate 30, and thus the splints are securely held with sufficient distance between them to prevent the heads from sticking after the splints are dipped. Any other suitable fastening device may be used to fix the relative positions of the plates 32 and 30 without departing from the principle of my invention.

To prevent the splints 19 from being drawn too far through the gripping device 29, an abutment-screen 37 is stretched across the casing 10 parallel with the gripping device 29 and box 16, as shown clearly in Figs. 1 and 2. This screen does not seriously interfere with the passage of air; but the mesh is fine enough to stop the splints and at the same time to even them, so that the protruding ends of the splints will be level.

To enable the gripping device 29 to be placed easily in and out of the casing, doors 38 are provided on the sides of the casing, these being hinged at the edges, as shown at 39, and normally closed by springs 40, although any suitable doors may be used, and, in fact, the side openings in the casing 10 might be closed by the edges of the gripping device itself without the use of doors and without affecting the invention.

It has been found by experiments that rather better results are obtained where the gripping device 29 is vibrated in connection with the box 16, and to this end a dowel connection is made between the two parts, as shown clearly at 41, so that they will move together in a vertical plane; but the gripping device may be drawn forward away from the box 16 to enable it to be easily removed from the casing 10 when the gripping device is filled with splints.

To further facilitate the removal of the

gripping device a guideway 29^a is arranged at one side of the casing 10, into which the gripping device may be pushed.

A convenient means of moving the gripping device 29 back and forth in relation to the box 16 is shown clearly in Figs. 1 and 2, where the gripping device is coupled at the top and bottom to slide-plates 42, which are also connected to the frame of the screen 37, so that the screen may be moved back in connection with the gripping device, and these slide-plates 42 have pins 43, connecting with the slotted cams 44 on the vertical shaft 45, which is journaled in the casing 10 and is provided with a suitable handle 46, by which it may be turned. Thus by turning the cams 44 in one direction the gripping device 29 and screen 37 are moved forward, while by turning the cams in the opposite direction the aforesaid parts are moved back to the first position.

A slide-plate 47 is arranged transversely in the casing 10, so as to extend between the gripping device 29 and the box 16, this slide-plate having a handle 48, (see Fig. 3,) by which it may be withdrawn. The apparatus works well without this slide-plate; but it is sometimes an advantage, as by gradually drawing the slide-plate out while the air-draft is on it makes an increased pressure opposite a part of the gripping device, so that the splints are rather more certain to be forced into the said gripping device.

The modification shown in Fig. 5 shows means of using both an exhaust and direct blow for forcing the splints into the gripping device. As here shown the casing 10^a is double-ended, one end being connected with the exhaust-fan 14, as already specified, while the outlet of the fan connects by a pipe 13^a, which is controlled by a valve 15^a, with the opposite end of the casing 10^a, and thus when the exhaust-fan or blower is started it sucks the air from one end of the casing and returns it to the other end, so that a strong current is generated. In this form of the device I have shown a door 48^a on top of the casing 10^a to provide for inserting and removing the gripping device; but it is obvious that very many different arrangements may be used for providing for this feature, and I have shown two methods simply to illustrate and emphasize this fact.

It is also obvious that many modifications of the gripping device may be used without departing from the principle of my invention, as I lay more stress on the method of forcing the splints into any suitable gripping device than on the precise apparatus, and therefore I have shown a second form of gripping device in Fig. 6, which may be used, and in which parallel bars 48 are employed, these being movable toward and away from each other, and they are provided with recesses 49. One bar 48 of each pair is provided with tapering ends 50, and the bars are held in a suitable frame 51. Wedges 52, which are carried by

bars 53, are adapted to enter between the tapering ends of one bar 48 and the adjacent bar, and thus squeeze the bars together, so as to hold the match-splints between them. The wedges are secured rigidly to the bars 53, which are movable back and forth on guide-rods 54, which are fastened to the frame 51. I have shown only a portion of the bars 48 in position in the frame 51; but it will be understood that in practice the frame is entirely filled with the bars. After the splints are assembled in the gripping device the latter may be removed from the casing and the splints may then be dipped in the usual manner.

It will be seen from the foregoing description that the match-splints may be assembled with great rapidity and nicety in a gripping device, and it will be understood from this description that other light straight articles may, if desired, be assembled in the same manner.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for assembling match splints, comprising, a receptacle adapted to hold the splints in mass and in parallel relation, a gripping device opposite the receptacle and at one end of the match splints to receive the individual splints, and means for forcing an air current through the apparatus to carry the splints endwise into the gripping device, substantially as described.

2. An apparatus for assembling match splints, comprising, a receptacle adapted to hold the splints in mass and in parallel relation, a gripping device opposite the receptacle and at one end of the match splints to receive the individual splints, means for forcing an air current through the apparatus to carry the splints endwise into the gripping device, and mechanism for vibrating the receptacle or gripping device during the assembling process substantially as described.

3. An apparatus of the kind described, comprising a splint holding receptacle, a gripping device placed opposite the receptacle and pro-

vided with perforations or recesses to receive the individual splints, a perforated abutment opposite the gripping device to limit the protrusion of the splints from the gripping device, and means for forcing an air current through the receptacle and gripping device, the said perforated abutment being in the course of the said air current, substantially as described.

4. An apparatus of the kind described, comprising a splint holding receptacle having one side open and the other side provided with a perforated wall, a gripping device opposite the open side of the splint receptacle, the said gripping device having perforations or recesses to receive the individual splints, a perforated abutment opposite the gripping device, and means for forcing an air current through the splint receptacle and gripping device, the said perforated abutment being in the course of the said air current, substantially as described.

5. An apparatus of the kind described, comprising a splint holding receptacle having one side open and the opposite side perforated, a gripping device having perforations or recesses to receive the individual splints, a perforated abutment opposite the gripping device, means for vibrating the gripping device and splint receptacle, and means for forcing an air current through the splint receptacle and gripping device, the said perforated abutment being in the course of the said air current, substantially as described.

6. The combination with the casing and means for forcing an air current through it, of the splint holding receptacle having one side open and the opposite side perforated, the gripping device having recesses or perforations to receive the individual splints, and mechanism for moving the gripping device in and out in endwise relation to the splints, substantially as described.

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Witnesses:

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F. W. LONGFELLOW.