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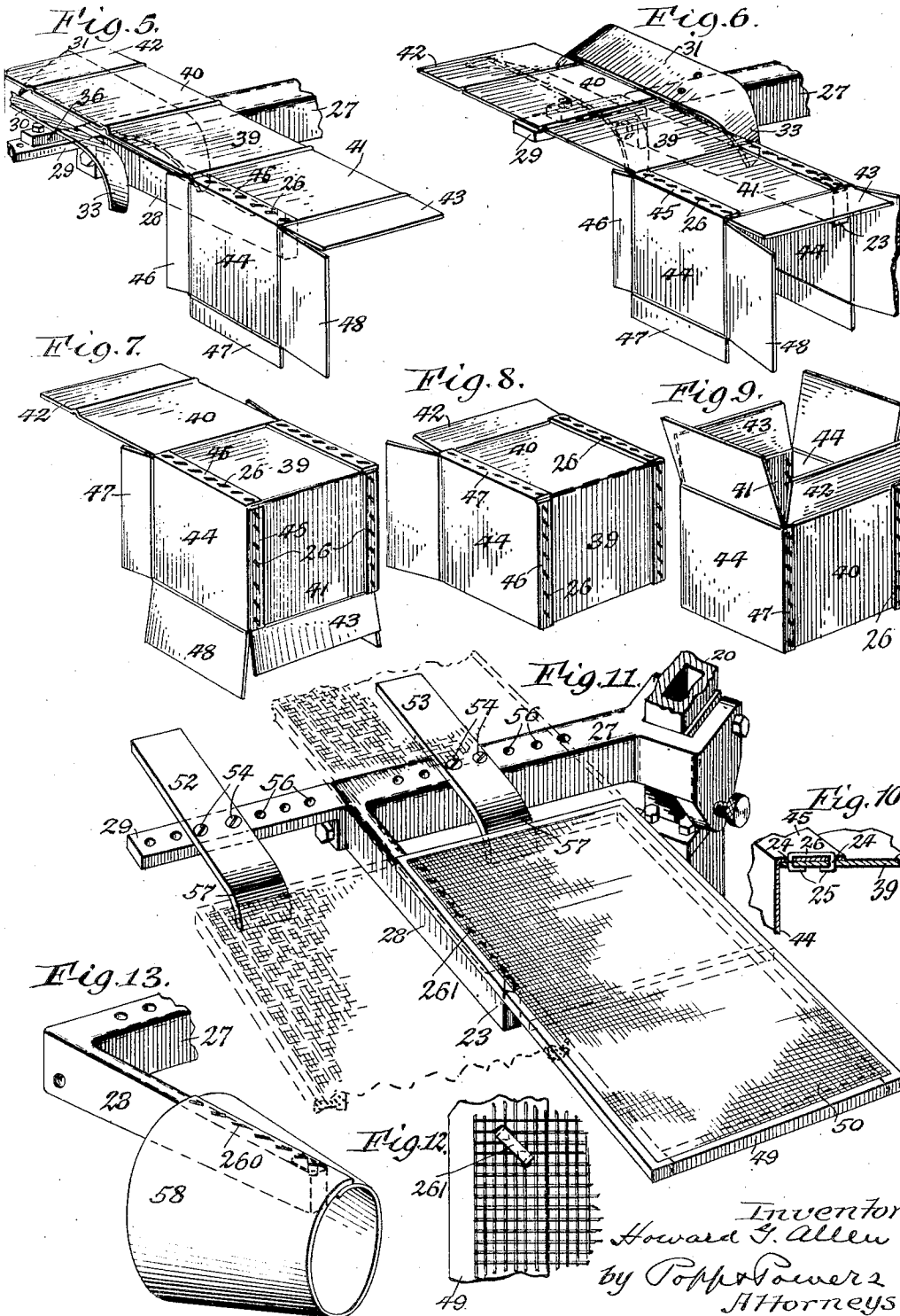
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ASSEMBLING MACHINE

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ASSEMBLING MACHINE.

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This invention relates to an assembling machine for use in connecting parts or articles by means of staples, nails, stitches, rivets, screws or other fastenings, this invention being applicable to wire stitching machines, thread sewing machines, nailing machines, screw driving machines, riveting machines and the like.

secure the advantages due to such an arrangement of the staples, stitches or fastenings.

Another object of this invention is the provision of means whereby articles having parts of any length may be fastened or stapled together without making the supports of the stapling or fastening mechanism unduly long, thereby avoiding undue cost and weight of metal in the machine and facilitating its transportation.

In the accompanying drawings:—

Fig. 1 is a fragmentary perspective view of a wire stapling or stitching machine equipped with my invention.

Fig. 2 is a horizontal section thereof taken on line 2—2, Fig. 1.

Fig. 3 is a vertical longitudinal section taken on line 3—3, Fig. 2.

Fig. 4 is a perspective view of the sections of a three part carton capable of being assembled and connected in accordance with this invention.

Figs. 5 and 6 are perspective views showing the method of stitching the first panel of a central carton section to two side sections.

Fig. 7 is a similar view showing the manner of connecting another panel of the central carton section with the adjacent edges of the side sections.

Fig. 8 is a similar view showing the manner of attaching the third panel of the central carton section with the third edges of the side sections.

Fig. 9 is a similar view of the completed carton showing the same right side up and its cover flaps opened.

Fig. 10 is a fragmentary sectional view showing one form of fastening for use in accordance with my invention for connecting two parts.

Fig. 11 is a fragmentary view showing the manner of stapling a woven wire fabric on a frame in accordance with this invention for making wire window screens and doors.

Fig. 12 is a fragmentary plan view of the frame and fabric and a staple connecting the same.

Fig. 13 is a perspective view showing this invention employed in making conical waste paper receptacles or similar containers.

In machines of this character it has been necessary to present the parts of the work to be assembled or connected to the mechanism which applied the fastening thereto in such manner that the parts to be connected moved in a direction either parallel to the face of the machine or at right angles thereto. When moving the parts to be assembled in this manner to the fastening mechanism it is impossible to apply the stitches, staples or nails to the same in any arrangement other than parallel or at right angles with the face of the machine.

It has been found highly advantageous to apply the fastenings such as U-shaped staples and stitches to the parts to be connected in a row so that each stitch is arranged obliquely to the length of the row, inasmuch as this causes each staple or stitch to extend across and connect a number of threads, wires, strands or fibers of the fabric to be connected, which strands, threads, wires or fibers are usually interwoven or intersect each other, or extend in different directions.

In machines of this character as heretofore constructed the length of the article capable of being handled in this machine was limited by the distance from the stitching mechanism to the supporting standard and this necessitated making the head and arm supporting the stapling mechanism and rest or clincher box unusually heavy in order to obtain the requisite strength to withstand the strain imposed upon the same.

One object of this invention is to provide simple and efficient means whereby the parts to be assembled may be supported and guided with reference to the working position so as to permit the fastening means to be applied easily and conveniently to the parts to be connected and enable each staple, stitch or fastening to be arranged obliquely relatively to the length of the row and thus

Similar characters of reference indicate like parts throughout the several views.

Although this invention is capable of use in various kinds of assembling machines adapted to fasten together different parts or members, the same is shown in the drawings, for example, in connection with a stapling or stitching machine adapted to form and drive U-shaped staples through the overlying portions of the parts to be assembled for the purpose of connecting the same.

In its general organization this machine comprises a main support which in the present instance has the form of an upright column or standard 20, and a staple forming and driving mechanism 21 of any suitable construction arranged at a distance from the front side of the standard and mounted on a head 22 which projects forwardly from the upper end of the standard so that the face of this head turns forwardly and is arranged transversely relative to the length of the machine.

Below the staple forming and driving mechanism is arranged a rest 23 upon which the overlying parts to be connected are placed and supported during the operation of fastening them together by a staple. This staple, as shown in Fig. 10 has two legs 24 adapted to be driven inwardly through two overlying members and clinched or turned with their ends 25 against the inner or under side of said members, and a cross bar 26 connecting the outer ends of said legs and engaging with the upper or outer side of said members. These staples may be made of wire which is of any suitable form in cross section but for light work the same is usually round in cross section while for heavier work the staples are usually made from flat stock.

This rest 23 may be provided with a clincher mechanism of any well known and approved construction whereby the ends 25 of the staple legs are turned and pressed against the underside of the parts to be connected after being driven through the same.

In the preferred construction of my invention the rest 23 is supported from the upper part of the standard by a supporting arm which carries the rest at its front end and has its rear end mounted on the standard while its intermediate part is deflected laterally horizontally from a line between the front and rear ends of the arm to form a rear section 27 and a front section 28. This deflection is preferably toward the left when viewing the machine from the front and the sections 27, 28 are arranged at right angles to each other. The rear section 27 extends forwardly and laterally outward from the standard at an angle of forty-five degrees relative to a line extending from the front to the rear end of the supporting

arm and the front section 28 extends forwardly and laterally inwardly from the front end of the rear arm section to the rest 23 at an angle of forty-five degrees relative to said line from the front to the rear end of said arm.

Projecting forwardly from the central part of the supporting arm is an extension 29 which is in line with the rear section of the supporting arm and practically forms a part thereof.

When this supporting arm and its extension are employed for stapling together the sections of a container or carton, two guides, guards, aprons or shoes 30, 31, are employed for directing these sections over the supporting arm and its extension so that the dangling parts of the carton or container will not conflict therewith and interfere with the stapling operation and instead permit this work to be done expeditiously and economically. These guides are preferably constructed of sheet metal or similar material and are arranged on opposite sides of the front section of the supporting arm and parallel therewith and adjacent to the elbow between the front and rear sections of the supporting arm. These guides are spaced apart at their inner longitudinal edges so as to form a gap or slot 32 therebetween and the same are inclined so that they both dip at their opposing inner edges or toward a line running from said rest rearwardly along the front section of the supporting arm. These guides also are inclined or turned downwardly at their front ends or toward said rest 23, as shown at 33, and their rear ends are also preferably curved or inclined downwardly, as shown at 34. The opposing inner front corners of the two guides 30, 31, are cut away at an angle, as shown at 35, for a purpose which will presently appear. These two guides are preferably so mounted that the same may be adjusted toward and from a path extending rearwardly from the rest along the front section of the supporting arm, this adjustment being preferably effected by mounting these guides on blocks 36, 36 and securing the same by means of screws 37, 37 to different parts of the upper side of the rear supporting arm section and the extension thereof by engaging the screws with one or another of two rows of threaded openings 38, 38, formed, respectively, in said rear arm section and its extension, as best shown in Fig. 3.

For the purpose of illustrating the use of this invention the method of operation in assembling a three part carton such as that shown in Figs. 4-9 will be first described. This carton consists of a central section and two side sections, the central section having a bottom panel, 39, two side panels 40, 41, connected with opposite ends of the bottom panel and two cover or sealing flaps 42, 43,

connected with the outer edges of the side panels 40, 41, and each side section consisting of a panel 44, three attaching flanges 45, 46, 47, at three edges thereof, and a cover flap 48 at the fourth edge thereof.

When assembling a three part carton of this character the operator places the central section in an elongated condition flatwise on the front section of the supporting arm and the guides 30, 31 and brings one longitudinal edge of the same in line with one side of the front section of the supporting arm and also brings the corresponding longitudinal edge of the foremost side panel of this section between the rest 23 and the staple forming and driving mechanism. In Fig. 5, the central section of the carton is placed in this manner with its left hand edge in the working position. One of the side sections of the carton is now placed vertically along the left hand side of the front guide arm section and its uppermost attaching flange 45 is folded over the left edge of the foremost side panel 41 and then these two carton sections are moved step by step across the working point between the rest 23 and the stapling mechanism and a row of staples or stitches is applied to the overlying parts of these carton members so that the same are connected with each other. This stapling or stitching together of these parts may be effected either by moving the carton members forwardly or backwardly.

After the left hand side section of the carton has been stitched to the foremost panel of the central section the right hand side section of the carton is in like manner stitched or stapled to the foremost panel of the central section, as shown in Fig. 6. The central section of the carton is now bent between the foremost side panel and the bottom panel so that the foremost panel which has been stapled to two corresponding edges of the side sections hangs in front of the working position and the bottom attaching flaps 46 of the side sections are now folded over on the bottom panel of the central section and successively stitched thereto, as shown in Fig. 7. The central and side sections of the carton are now turned once more and the side attaching flanges 47 of the side sections folded over the rearmost side panel of the central section of the carton and then stitched successively thereto, as shown in Fig. 8. This completes the carton so that upon turning the same right side up and opening its sealing flaps the same may be filled with the material to be packed therein and then the flaps may be closed and secured in this position in any usual manner for protecting the goods.

As the carton sections are moved backwardly during the progress of the stitching operations the advancing top edge of the side sections upon engaging the inclined inner

front edges 35 of the guides will be directed thereby toward the front arm section and thereby not interfere with the advancing movement of the carton sections.

By providing a space between the inner edges of the guides the respective longitudinal edge of the central carton section is able to lie close to the front arm section and permit of applying the stitches properly thereto, and by raising the outer longitudinal edges of these guides above the inner longitudinal edges thereof this insures carrying the free longitudinal edge of the central carton section over the rear section of the supporting arm which carton section, due to its flabby character, might otherwise strike this arm section and be impeded in its progress.

Owing to the capacity of adjusting the guides transversely relative to the path of the carton it is possible to increase or decrease the spread of these guides in accordance with the required width of the guides to secure the best results.

While thus assembling or fastening together the several sections of a carton the advancing rear end of the central section projects rearwardly beyond the rear section of the supporting arm and along the left hand side of the standard, as illustrated, for example, by dotted lines in Fig. 2. Owing, therefore, to the angular construction of the supporting arm which permits the parts in the act of being connected to pass by the standard it is possible to assemble members of which the upper parts passing over the guides and supporting arm may be of unlimited length, and in no wise interfere with the stitching or fastening operation. This machine therefore is not limited in its capacity in this respect as is the case in stitching and similar machines in which the work pieces are moved backwardly from the stitching mechanism toward the standard and are arrested in this backward movement by striking this standard.

By reason of the absence of any limit in length of parts which may be stitched or fastened together in this machine it is unnecessary to make the supporting arm and the head supporting the stapling mechanism unduly long in order to obtain a reasonable range of capacity as to length of articles which can be handled by the machine, but instead permits of making the supporting arm and head comparatively short, thereby enabling the same to be made comparatively light and still retain the required strength and durability whereby the cost of production and transportation is materially reduced.

Another instance in which parts of articles of abnormal length may be fastened together by this machine is shown in Figs. 11 and 12 in which case a rectangular frame 49 and a panel 50 of woven wire fabric are

connected at their edges by means of staples 261 to form window screens or screen doors. When operating on articles of this character the procedure is similar to that practiced in stitching together the members of cartons inasmuch as the longitudinal edges of the frame and wire fabric are presented successively to the stapling mechanism and moved backwardly obliquely past one side of the standard. The guides 52, 53, for carrying the frame over the rear arm section and the extension thereof in this instance consist of flat bars secured to the top of this arm section and extension by means of screws 54 engaging with one or another of rows of holes 56 in this arm and extension and provided with downwardly curved front ends 57, as shown in Fig. 11.

By moving the parts to be fastened together obliquely relative to the stapling mechanism the U-shaped staples are applied to the connected members in a position which is oblique or at an angle to the length of the row of staples, as shown in Figs. 5-9, 11 and 12. Due to this arrangement of the staples each one embraces a plurality of crossing or intersecting fibers in the case of paper cartons, and also a plurality of interwoven wires which are arranged at right angles to each other, in the case of a screen and frame, whereby a more extended and effective hold of the staples on the material is obtained and a much stronger and durable article is produced.

Another instance in which this invention can be used to advantage consists in making a waste basket or similar container from a sheet of paper board or similar material which is first rolled to form a tubular body 58 and then connecting its overlapping longitudinal edges by means of a row of staples 260 each of which is arranged obliquely to the length of the row, as shown in Fig. 13, by moving this article obliquely past the stapling mechanism while the same is being supported on the front section of the supporting arm.

I claim as my invention:—

1. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, and an extension projecting forwardly from said arm and arranged in line with the rear section of the same.

2. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a sup-

porting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, and a guide arranged on the rear section of said arm and adapted to be engaged by the parts to be assembled.

3. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and arranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled.

4. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, and a guide arranged on the rear section of said arm and adapted to be engaged by the parts to be assembled and inclining forwardly and also laterally toward said front arm section.

5. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and arranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled and inclining forwardly.

6. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and ar-

ranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled and inclining forwardly and also inclining toward said front arm section.

7. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and arranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled and inclining forwardly and also inclining toward said front arm section, said guides being adjustable on said rear arm section and said extension in a direction parallel with the length of said rear arm section and said extension.

8. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, and a guide arranged on the rear section of said arm and adapted to be engaged by the parts to be assembled and inclining forwardly and also

laterally toward said front arm section, the lower front corner of said guide being cut away.

9. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard, and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and arranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled and inclining forwardly and also inclining toward said front arm section and the opposing inner front corners of said guides being cut away.

10. An assembling machine comprising a standard, a rest arranged at the working point in front of the standard and adapted to support the parts to be connected, a supporting arm mounted at its rear end on said standard and carrying said rest at its front end and having its intermediate part deflected laterally horizontally to form front and rear sections which are arranged at right angles to each other, an extension projecting forwardly from said arm and arranged in line with the rear section of the same and guides arranged on said rear section and on said extension and adapted to be engaged by the parts to be assembled, said guides being separated from each other by an intervening space.

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