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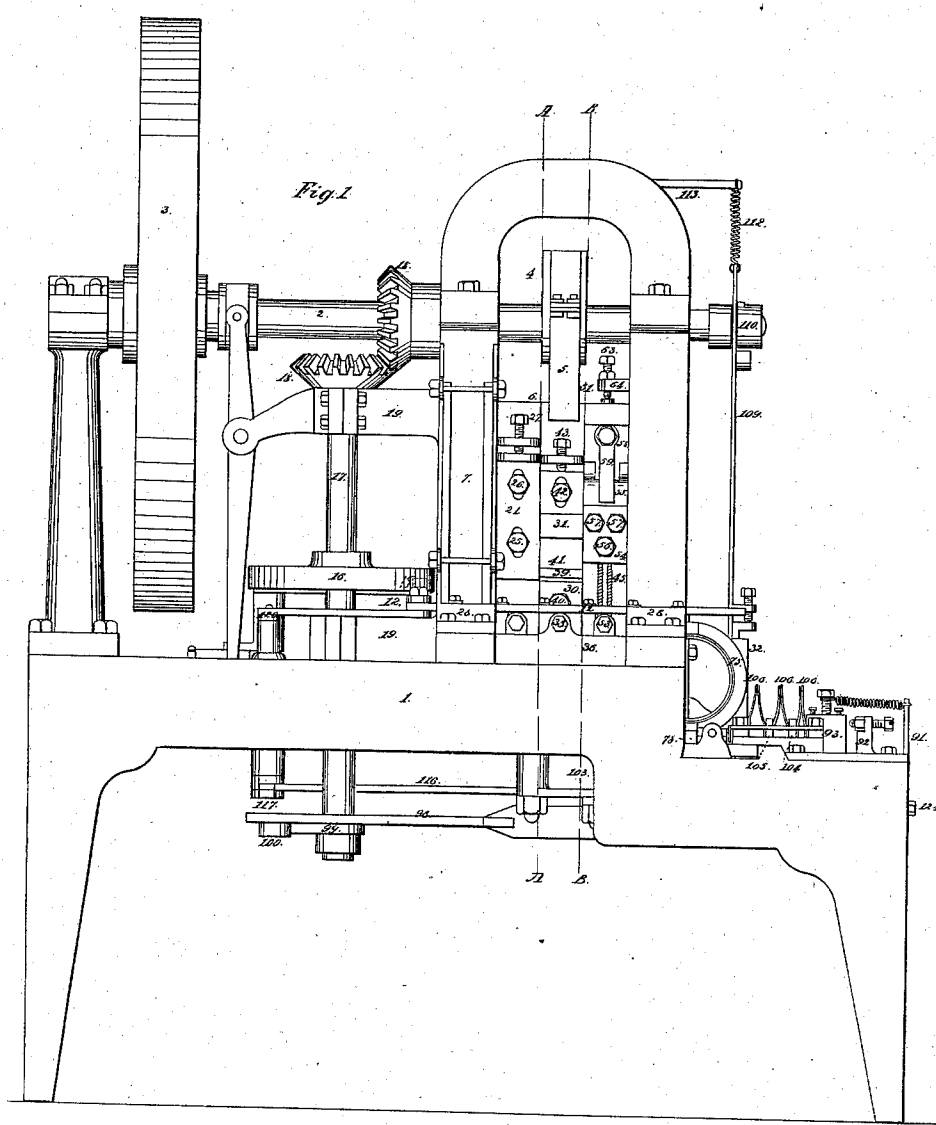
Sheet 1-4 Sheets.

Brown & Van Gieson,

Making Hinges,

N^o 31,949.

Patented Apr. 9, 1861.



Witnesses:
H. James Weston.
S. S. Roberts.

Inventors:
Edmund Brown.
Van Gieson.
By Wm. B. Brown
att'y

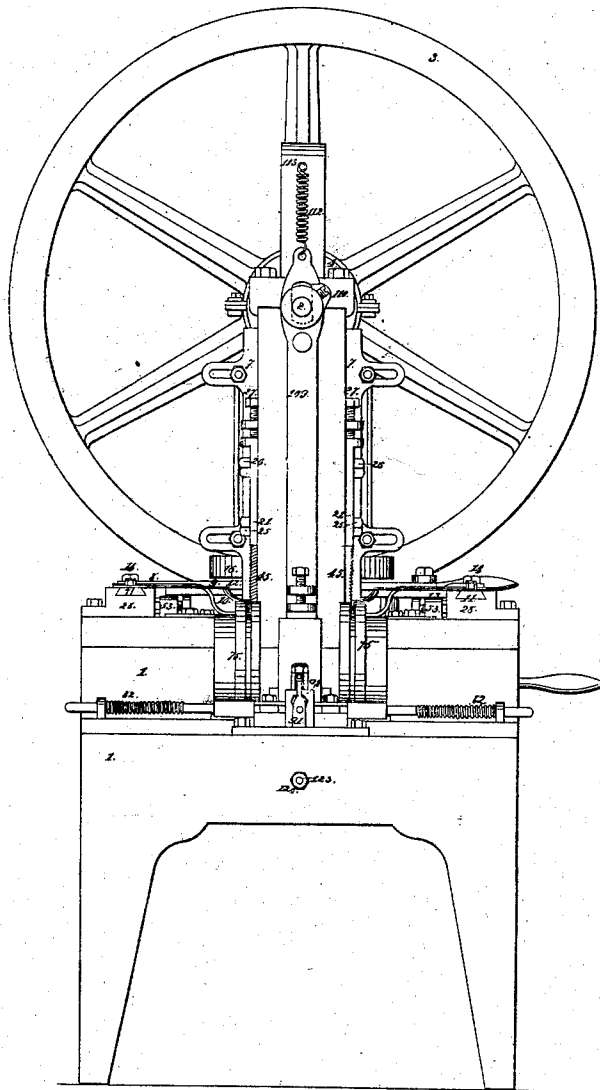
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Fig. 2



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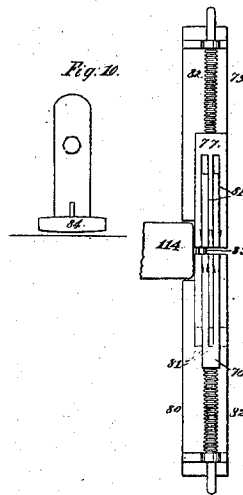
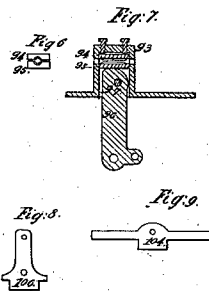
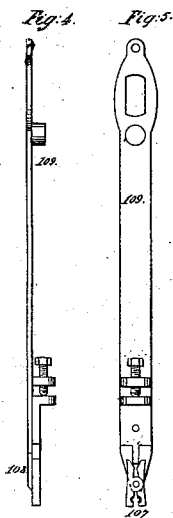
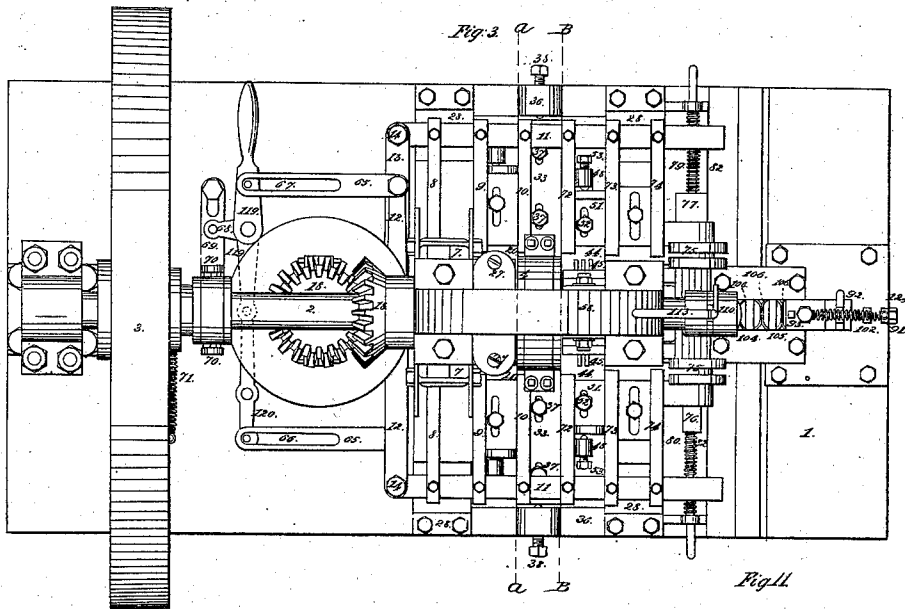
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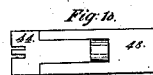
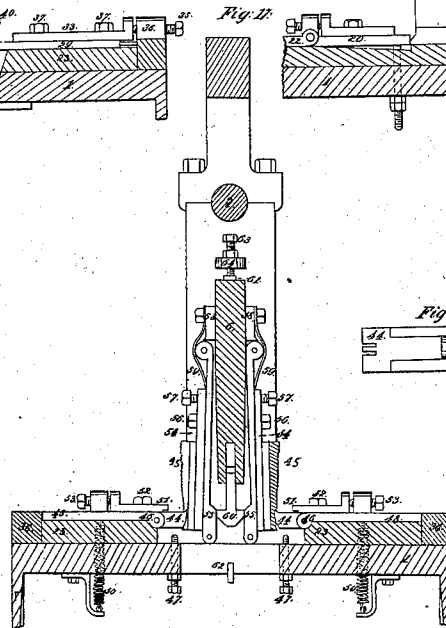
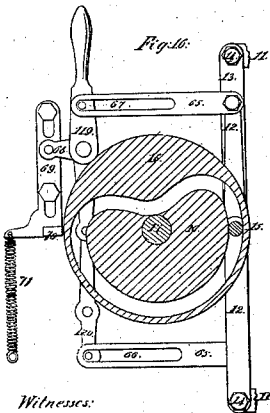
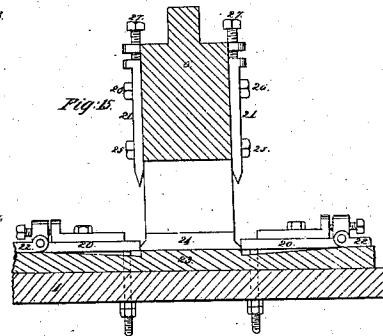
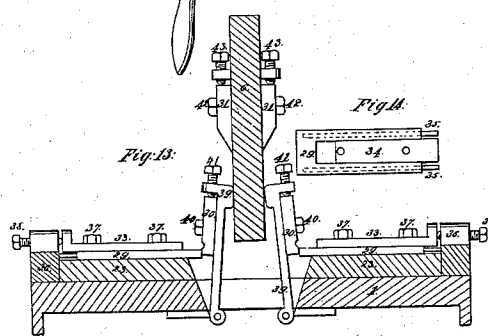
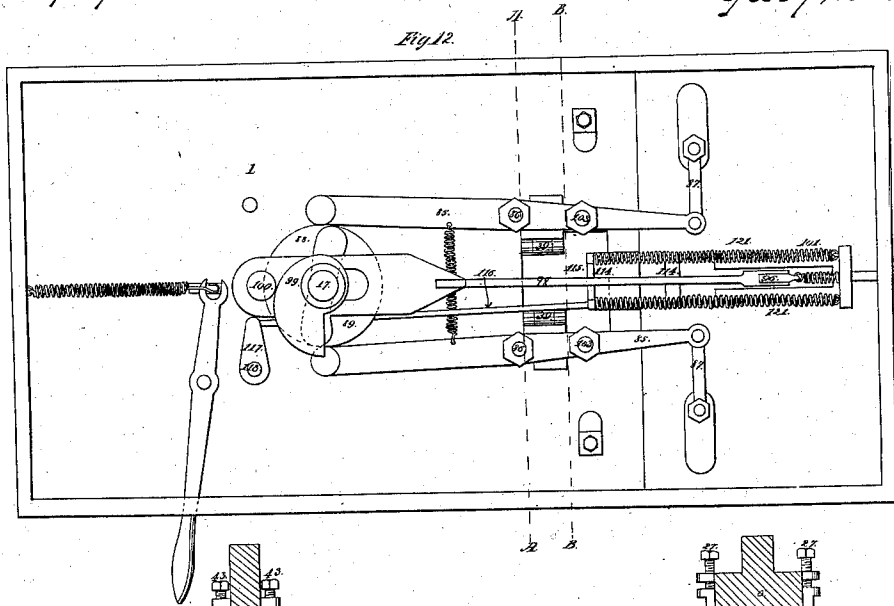
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UNITED STATES PATENT OFFICE.

E. BROWN, OF WATERBURY, CONNECTICUT, AND W. H. VAN GIESON, OF PATERSON,
NEW JERSEY.

MACHINE FOR MAKING BUTT-HINGES.

Specification of Letters Patent No. 31,949, dated April 9, 1861.

To all whom it may concern:

Be it known that we, EDWARD BROWN, of Waterbury, in the county of New Haven and State of Connecticut, and WILLIAM H. VAN GIESON, of Paterson, in the county of Passaic and State of New Jersey, have invented certain Improvements in Machinery for Making Butt-Hinges, the construction and operation of which we have described in the following specification and illustrated in its accompanying drawings with sufficient clearness to enable competent and skilful workmen in the arts to which it pertains or is most nearly allied to make and use our invention.

Our said invention consists in, first, the combination of parts hereinafter described by which when the folder or swage which commences the operation of turning the joint is brought down upon the blank from which a part of the hinge is formed, a part of the bed upon which the said blank is supported is allowed to yield to accommodate itself to the action of the folder, while the extreme edge which is to be bent up in the formation of the joint is firmly supported substantially as hereinafter set forth. Second. The combination of a fixed stop to support the edge of the blank from which the hinge is to be formed, with a reciprocating vibrating die and a sliding support under the blank; for completing the turning of the joint, as hereinafter more fully set forth. Third. The combination of parts hereinafter described by which while floats or files are made to operate upon the parts of the hinge for the purpose of perfecting the fitting of the joint, the back of the hinge, or the edge farthest from the joint, is supported by an overhanging stop by which it is not only held up against the floats or files, but also kept from being tipped out of position by their operation substantially as set forth. Fourth. The combination and arrangement of parts hereinafter described, by which the angular position of the hinge with reference to the floats or files while being operated upon by the latter may be adjusted as hereinafter more fully set forth. Fifth. The combination with the apparatus for turning and finishing the joint of the hinge, of fingers or slides which move the blank forward to the proper position for operating upon as hereinafter more fully set forth. Sixth. The connection of the slides with the

clutch by which the main or operating shaft is connected to the driving pulley, in such a manner that an undue strain upon the fingers which move the blanks into position will disconnect the shaft from the pulley and thus stop the machine, thus preventing the breaking of the parts by any derangement in their action, as hereinafter more fully set forth. Seventh. The device hereinafter described for guiding the hinges and delivering them from the apparatus in which the joint is turned and finished, to the slides which bring them into position for driving the wires to connect the parts of the hinge, as hereinafter more fully set forth. Eighth. The construction and arrangement of the slides which bring the parts of the hinge into position for driving the wire to connect them, and their connection and arrangement with the driving parts in such a manner as to bring the hinge into proper position for driving the wire, and to support it during that operation, as hereinafter more fully set forth. Ninth. The combination with the said slides of a guide placed above them and so constructed as to hold the hinge down upon the slide during the operation of driving the wire, substantially as set forth. Tenth. The combination with the apparatus for driving the wire of supports separated by springs which may be collapsed as the driving apparatus advances, and allow the supports to approach each other, and which when relieved will expand and distribute the supports upon the wire so as to support it at regular intervals or nearly so, thereby preventing the wire from bending in the operation of driving substantially as herein set forth. Eleventh. The combination with the apparatus for supporting the hinge and driving the wire of a stop against which the hinge abuts during the operation of driving the wire, said stop being supported by springs and connected to the clutch by which the main shaft from which the parts receive motion is connected to the driving pulley, in such a manner that an undue pressure against the stop will release the clutch and stop the machine, to prevent damage resulting from an undue resistance of the wire to the operation of driving, substantially as set forth. Twelfth. The combination with each other and with the machine for making hinges of the parts hereinafter described for cutting off and pointing

the wire after the proper length has been driven into the hinge, substantially as and for the purpose set forth.

In the drawings which accompany this specification Figure 1 is a side elevation of the machine, exhibiting the side which is from the operator. Fig. 2 is an end elevation; representing the end of the machine which is at the right hand in Fig. 1. Fig. 3 is a plan of the machine; the side toward the operator being represented toward the top of the page. Fig. 4 is an edge elevation of the apparatus for cutting off the wires which form the joint or axis after being driven into the hinge. Fig. 5 is a side elevation of it, corresponding with an end elevation of the machine shown from the side opposite that represented in Fig. 2. Fig. 6 is a detail view of the boxes or plates used to clamp the wire which forms the axis of the hinge, for the purpose of driving it forward. This figure (6) shows the end of these plates. Fig. 7 is a detail sectional elevation parallel to the longitudinal or side elevation of the machine, showing more fully the device for clamping the wire for the purpose above stated. Fig. 8 is a detail elevation of one of the springs which separate the guides through which the wire which forms the axis of the hinge passes, and by which it is supported between the driving apparatus and the hinge. This elevation corresponds to an end elevation of the machine in respect to the plane of its projection. Fig. 9 is an elevation, corresponding in its plane of projection to an end view of the machine, of one of the guides which support the wire between the driving apparatus and the hinge when said wire is being driven into the hinge. Fig. 10 is an elevation corresponding in its plane of projection to an end elevation of the machine, of a guide for keeping the hinge down to its place, when brought into position for driving the wire. Fig. 11 is a plan of the slides which bring the parts of the hinge into position for driving the wire which forms the axis of the joint, and also represents a stop against which the parts of the hinges are pressed by the wire while it is being driven in to unite the parts of the hinge. Fig. 12 is an underside view of the machine. Fig. 13 is a detail sectional elevation of some of the parts which lie at the right hand of the line A, A, as drawn across Figs. 1, 3, and 12, which parts are used for the completion of the operation of turning the joint of the hinge. Fig. 14 is a plan representing in detail the horizontal slide upon which the hinge is supported during this stage of its construction. Fig. 15 is a detail sectional elevation, showing parts at the left hand of the line A, A, as drawn across Figs. 1 and 3, which parts are used for the purpose of commencing the formation of the

joint of the hinge. Fig. 16 is a detail sectional plan, showing the cam by which the slides, which carry the fingers for feeding the blanks into place, which form the hinge, are operated, and also the attachment to the slides and to the other parts of the machine by which the driving pulley is disengaged by an undue pressure or strain brought upon the fingers which feed the work forward. Fig. 17 is a detail sectional elevation showing those parts at the right hand of the line B, B, which perform the operation of cleaning out or filing out the joint of the hinge so as to make the parts fit together with facility. Fig. 18 is a detail plan showing the support for the hinge during the operation of filing the joint.

1 is the bed or frame of the machine.

2 is the main shaft, upon which the fly wheel or pulley 3 is secured. The shaft 2 is supported upon two uprights toward the right hand end of the machine and a post or upright set at the extreme left hand end.

4 is an eccentric on the main shaft 2, by means of which and the connecting rod 5, motion is communicated to the slide 6 which supports and carries the parts by which the hinge is formed. It may be proper to remark in this place that the metal from which the hinges are formed is first cut into shape by means of dies and afterward placed in the hoppers or reservoirs 7, from which the pieces are fed to the working parts (which form them into proper shape) by fingers 8, 9, and 10, attached to the slides 11. These slides have arms 12 and 13 attached to them by means of screw bolts 14, which clamp them so firmly together as to prevent rotation upon their junction with each other except when subjected to more than the ordinary working strain. These arms 12 and 13 are also united in the middle in a similar manner by the bolt 15, which terminates at the top in a round head which is operated upon by the cam 16, to give motion to the slides 11. The cam 16 is hung upon the shaft 17, which is connected to the shaft 2 by miter gearing 18, 18, for that purpose. The shaft 17, is hung in hangers 19, and also operates parts below the bed which are hereinafter described.

The fingers 8, 8, attached to the slides 11, are formed with a broad end which underlies the hinges or rather the blanks from which they are made, placed in the receiving box or hopper; and so constructed as at each vibration toward the right hand as represented in Figs. 1 and 3 they will remove a blank piece of metal from each hopper and slide it into the proper position upon the supports 20, to receive the operation of the folders 21, which perform the first part of the operation of turning the joint. This supporting plate 20 is hinged to the plate 22, which is attached to a raised and remov-

able portion of the bed which latter is recessed to allow the said plate 20 to descend to allow the slide or folder 21 to press the hinge down and form, or rather commence the formation of the joint. The hinge, or rather the metal of which it is being formed is further supported by the inner piece 24, which is stationary, and the end of it inclined as represented, to accommodate it to the bend to be given to the metal by the folder 21. This folder 21 is firmly though removably attached to the slide 6, by means of bolts 25 and 26, and made capable of adjustment by means of a set screw 27. The slides 11 are supported in brackets or blocks 28. As soon as the machine has recovered or returned from the stroke by which the commencement of the turn of the hinge is performed, the slides again move forward carrying with them the fingers 8, 9, and 10, and another blank piece of metal is removed into the position previously described as having been occupied by its predecessor, and the commencement of the formation of the joint is performed in a similar manner. At the same time the hinge previously commenced is moved forward upon the support 29, where the turning of the joint is completed by means of the action of the vibrating swages 30, 30, which are pressed up against the hinge by the inclined planes 31, 31, which are attached to the slide 6. The plate 29 which forms the support upon which the hinge rests at this stage of the operation is so fitted and constructed as to slide under the plate 33, and astride the plate 34, in such a manner that while it at all times abuts against the swage 30, and thus fully supports the hinge, it is still allowed to recede as the swage advances to complete the joint, and is caused to return to its position as the swage retires, by means of spiral springs contained in holes represented by dotted lines in Fig. 14, which springs abut at one end against rods 35, which latter abut against the fixed piece 36, attached to the bed of the machine. The edge of the hinge is supported during the operation, of completing the turning of the joint by a plate or stop 33, which is held down in position as represented by bolts at 37, 37, and this piece is made adjustable by means of the set screw 38, which passes through the piece 36 attached to the bed as above stated. The dies or swages 30, for completing the turning of the joint are attached to vibrating arms 39, by means of bolts 10, and made adjustable by means of set screws 41.

The arms 39 are attached by hinges to the underside of the bed as shown, and the inclined planes 31, 31, are attached to the slide 6, by means of bolts 42, and made adjustable by means of set screws 43 as represented. The hinge is at the next revolution moved

forward by the fingers 10, upon the support 44, where it is subjected to the action of the floats or files 45, which finish and smooth the joints of the hinge so as to make them fit together properly. This support is hinged at 46, as represented, to allow it to vibrate when pressed upon by the action of the files, the motion being restricted by a set screw 47, which passes through the bed of the machine. The plate 48, to which it is hinged is attached to the raising piece 23. Plate 44 is grooved as represented in Fig. 18, at the end, to allow the files to enter. The plate 44 is kept up in position, except when pressed upon by the action of the files, by a spiral spring 50, represented in Fig. 17. The stop 51 is firmly attached by means of the bolt 52, to the plate or support 44, and is set up in position by a set screw 53. This stop 51 is rabbeted on its underside, which admits the blank or part of the hinge, at the edge farthest from the files, and supports in such a manner as to prevent its being tilted out of position upon the plate 44. The files 45 are attached to the piece 54, which is hinged to the vibrating piece 55, at the lower end, and secured at the upper end by the bolt 56, an adjustment being provided for by means of the set screw 57. The arms 55, are hinged at their upper end to the pieces 58 which are attached firmly to the slide 6, and the arms 55 are pressed up against the slides by springs 59. The slide 60 is placed between the pieces 55, and a rod 61, passes up through slide 6 to operate slide 60 so as to throw out the arms 55, and consequently the files 45 so as to cause them to operate upon the hinge during the downward stroke, at the end of which stroke a piece 60 strikes against a stop 62 attached to the bed, and is forced up into position so as to allow the files to approach each other and thus clear the hinge. As the slide 6 again rises, the rod 61, strikes against the set screw 63, as represented, and the slide 60 is again forced downward in the slide 6, so as to throw out the files into the position represented in Fig. 17, preparatory to the next downward stroke. The set screw 63 is supported in a bracket 64, attached to the right hand upright, which supports the main shaft of the machine, as shown in Fig. 1. The fingers 8, 9, and 10, are attached as before stated to the slides 11, and operated by the cam 16. Should any of the blanks in the operations already described, catch in such a manner as to prevent their being moved forward by the application of the proper force, the slides 11 are so joined to the arms 12, and 13, and these arms to each other that the application of an undue force will draw them into a different angular position to each other, and thereby cause the slides 65, to draw upon one or both the pins 66, 67, thereby by means of their connection to each other and to the

lever arm 68, withdrawing the slide 69, which holds the clutch lever 70, and disengaging the working parts of the machine from the driving pulley, thereby stopping the operation of the machine, and allowing the difficulty to be removed. The slide 69 is held up in position by the spiral spring 71, when not withdrawn in the manner above stated.

10 The machine is so constructed that one part of the hinge is formed upon one side of it while the other part is being formed upon the other; both in the manner already described. When the joints of the hinge have been turned and filed as above described, the blanks or parts are pushed forward by the slides or fingers 72, 73, and 74, so as to bring them into the guides 75, down which they are guided to the slides 76, 77, being turned over in their descent, as is obvious from the guides being curved as represented in Fig. 1. A stop 78 prevents their passing too far inward to lie in their proper position upon the slides 76, and 77. The slides 76 and 77, are supported upon the slides 79 and 80, which have tongues 81, 81, which fit between tongues forming the slides 76, 77. The hinges fall in such a position upon the slides 76, and 77, that the curved joints fall between and beside the tongues of these slides and thus keep them in the proper position for one part to meet and match into the other. These slides 76, and 77, are forced by the springs 82 into a position nearer the center than is occupied by the tongues 81, when the slides 79 and 80 are at the outward end of their stroke, so as to allow the joints of the parts of the hinge to fall between the tongues of the slides 76, and 77 as above stated, but as the slides 79 and 80 are forced inward to bring the parts of the hinge together, as the parts come in contact, the springs 82 yield, allowing the slides 79, and 80, to approach the center without carrying with them farther the slides 76, and 77, by which the parts of the hinge are held firmly together during the operation of driving the wire which connects them.

The slides are prevented approaching each other so closely as to prevent the passage of the wire, by pins 83, the object of this provision being to prevent their closing when no hinge is upon them, and thereby crippling the wire or deranging the parts of the machine. The hinge is kept down upon the slides and prevented from rising during the operation of driving the wire which connects them, by the guide 84 which is attached to the bed and frame of the machine for that purpose, and is placed over the slides as indicated in Fig. 10, the line drawn under this figure indicating the top of the slides. The slides 79, and 80, are operated by means of levers 85, hung in pedestals attached to the bottom of the machine at 86, as a fulcrum said

levers being connected to the slides above mentioned by connecting rods 87, as represented in Fig. 12. These levers receive motion from the cams 88 and 89, hung upon the shaft 17, as represented in Fig. 12. The levers 85 are kept up to the cams by means of the spiral spring 90. When the hinge is in the position already described, upon the slides 76, and 77, the wire is driven into the parts of the hinge by the apparatus which we are about to describe. The wire being conveniently disposed upon a reel or other suitable device for supporting it, is passed through post 91, in which it is supported; through the post 92; and into the driving clamp 93, the construction of which is fully shown in Fig. 7; where it passes between the plates 94, and 95; between which it is clamped during the forward motion of the driver 93; the plates 94, 95, being caused to approach each other by means of force applied at the end of the lever 96, hung upon the pin 97, and so formed at its upper end that force applied in the proper direction to give the forward motion to the driver 93, will first press the plate 95 firmly so as to clamp firmly between it and the plate above it any substance which may be between them. The form of this arm or lever 96 for this purpose is sufficiently indicated in Fig. 7.

To operate this lever and give motion to the driving slide 93, a connecting rod 98 is attached to it by a joint at the lower end, which connecting rod receives motion, to draw the slide forward, from the cam 99, attached to the shaft 17, as drawn in Fig. 12, said cam operating upon the pin or roller 100, attached to the connecting rod 98. The lever 96, and by it the slide 93, is drawn back when released by the cam 99, by means of the tension of the spiral spring 101 represented in Fig. 12. The relaxation of the tension of the rod 98 upon the lever 96, relieves the clamp or driver from a portion of its friction upon the wire, thus allowing the driving clamp to slide back without carrying the wire with it; it being aided in releasing the wire by the spring 102, which is attached at one end to the driving clamp 93, and at the other to the post 91. The same spring is also useful in causing the clamp to act upon the wire when being forced forward. The levers 85, which operate the slides 79, and 80, are made adjustable by means of joints 103, so as to bring the slides exactly into the proper position to accommodate any sized joint of the various sizes of hinges; and these joints being only held by the friction of the parts, will also yield to an undue strain thrown upon them, and thus prevent the parts from breaking.

The wire is supported against bending between the driving clamp and the hinge, by the perforated slides 104, and 105, and by a support immediately back of the apparatus

by which the wire is cut off after being driven, the supporting slides 104, 105 being separated by springs 106, which are also perforated to allow the wire to pass. As the driving clamp advances, it is obvious that the guides or slides 104, 105, will approach each other so as to divide the space in which the wire is unsupported between the driver and the cutting apparatus into nearly equal portions, as the springs will very naturally yield nearly equally. As the driver is withdrawn, the slides 104, 105, and springs 106, resume their former position. After the wire is driven into the hinge it is cut off and pointed by the cutting pliers or jaws 107, and the chisel 108, operated by the slide 109, which receives motion from the cam 110 on the main shaft of the machine.

The cutting jaws 107 are supported by the standard 32 to which they are attached, and the chisel 108 is guided in the same standard. The jaws or cutting nippers have a small hole drilled through between them, which hole is so countersunk as to form a cutting edge on the side next the hinge, as indicated in Fig. 5. These jaws are operated by the slide 111, attached to the slide 109, being forced by the descent of the latter between the upper arms of these jaws 107, which operation closes them so as to nearly sever the wire, when the further descent of the slide 109 brings the chisel 108, down upon the wire and completes its dismemberment. The slide 109 is raised by a spiral spring 112, which is attached at one end to this slide 109, and at the other to the arm 113, attached to the cup on the uprights of the main frame. The hinge is supported against the pressure of the thrust of the wire in the operation of driving by a stop 114, shown in Figs. 3 and 12, and in detail in Fig. 11. This stop passes through the flange which unites the upper and lower portions of the bed, and at the left hand end is attached to a plate 115, which is connected by means of the rod 116, to the crank 117, on the shaft 118 upon which the crank 68, and levers 119, 120, are hung. The connection of this stop to the slide 69, is thus rendered complete, and it is obvious therefore that the exercise of undue pressure upon the stop 114 will disengage the clutch by which the fly wheel is connected to the main shaft, and thus stop the machine. The stop 114 is supported against the pressure of driving the wire by the springs 121, which are attached at one end to the plate 115, and at the other to the bar 122, of which the screw 123 forms a part, thus allowing an adjustment of the tension of these springs 121, by means of the nut 124, at the end of the machine, to accommodate the machine to the labor to be performed.

We are aware that various machines for turning the joints of hinges have been de-

vised, and also that the wire which forms the axis of the hinge has been fed into position to receive the other parts of the hinge to be bent around it by mechanism contrived for that purpose; and we are further aware that after the said joints have been formed the wires have been cut off by a device contrived or employed for that purpose. We do not claim broadly these features of operation in our machine, but—

Having thus fully described and ascertained the nature of the said invention, and in what manner the same is to be performed, we claim as the improvements which constitute it—

1. The combination of the swages 21, yielding supporting plate 20, and fixed stop 24, substantially as described, for the purpose set forth.

2. The combination of the fixed stop 33, dies 30, and sliding support 29, substantially as and for the purpose set forth.

3. The combination with the files 45, operating substantially as described, of the overhanging stop 51, and support 44, substantially as and for the purpose set forth.

4. The combination of the vibrating support 44, set screws 47, and springs 50, arranged substantially as described for the purpose set forth.

5. The combination with the swages and files hereinbefore described, for turning and finishing the joint of the hinge, of the fingers 8, 9, and 10, substantially as described for the purpose set forth.

6. The combination in the manner described, of the clutch for disconnecting the power from the machine, with the fingers for moving the blanks forward into position, the fingers being so connected to the clutch lever as to cause an undue strain upon the fingers 8, 9, and 10, or any one of them, to release the clutch lever 70, and thus disconnect the driving power substantially as described and shown.

7. The guides 75 so constructed and arranged in connection with the slides 76, 77, as to turn the parts of the hinge over and deliver them upon the slides 76, 77, substantially as, and for the purpose set forth.

8. The construction of the slides 76, 77, 79, 80, and their arrangement in connection with the apparatus for driving the wire, by which the parts of the hinge are brought into and held in the proper position to receive the wire which forms the axis of the hinge, substantially as and for the purpose set forth.

9. The combination with the said slides 76, 77, 79, 80, of the guide 84, substantially as and for the purpose set forth.

10. The combination with the driving clamp 93, of the supporting slides 104, 105, and springs 106, substantially as and for the purpose set forth.

11. The combination of the supporting

slides 76, 77, 79, 80, or other support for the hinge during the operation of driving the wire, and with the clamp 93 or other device for driving the wire to form the axis of the
5 hinge, of the stop 114, said stop being connected with the disengaging apparatus in such a manner that an undue pressure in driving the wire, will disconnect the driving power, substantially as and for the purpose
10 set forth.

12. The combination with each other and with a machine for making hinges, of the pliers or cutting nippers 107, and chisel 108, operated and operating substantially as described for the purpose set forth.

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