

No. 701,011.

Patented May 27, 1902.

C. N. BROWN.

MACHINE FOR DOUBLE SEAMING METAL SHEETS.

(Application filed Jan. 6, 1902.)

(No Model.)

6 Sheets—Sheet 1.

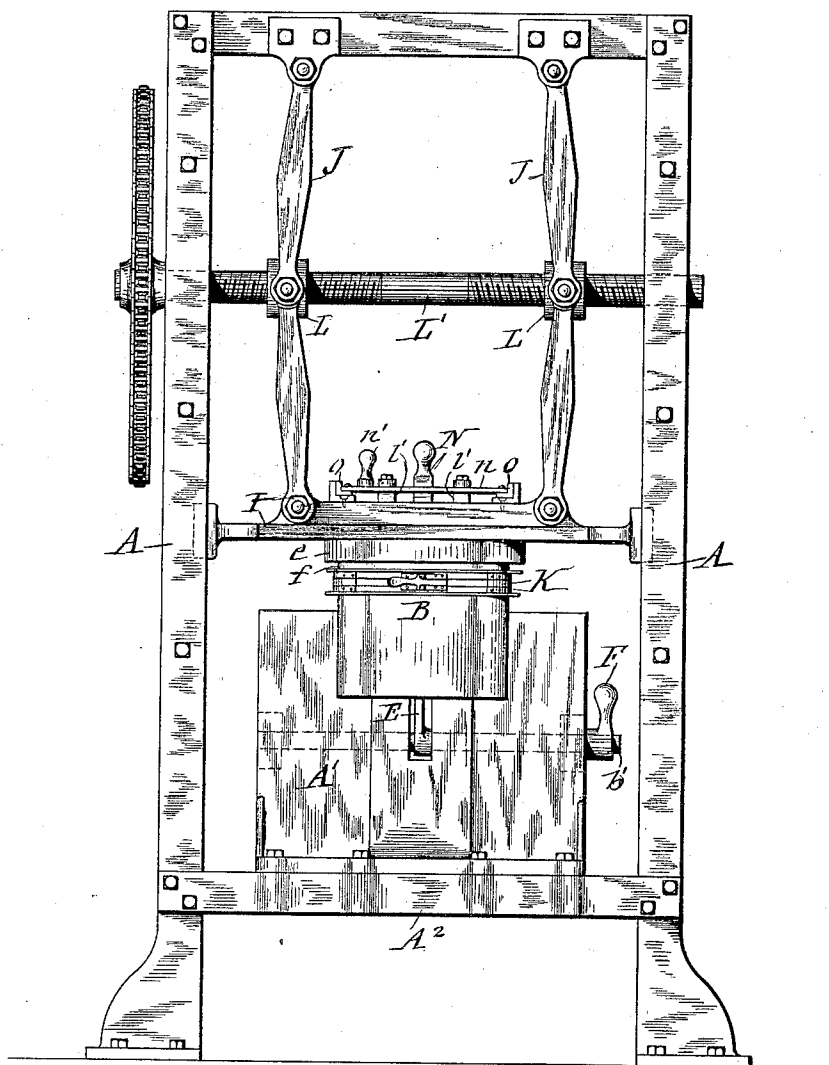


Fig. 1

WITNESSES:

J. J. Laess.
E. L. Meier.

INVENTOR

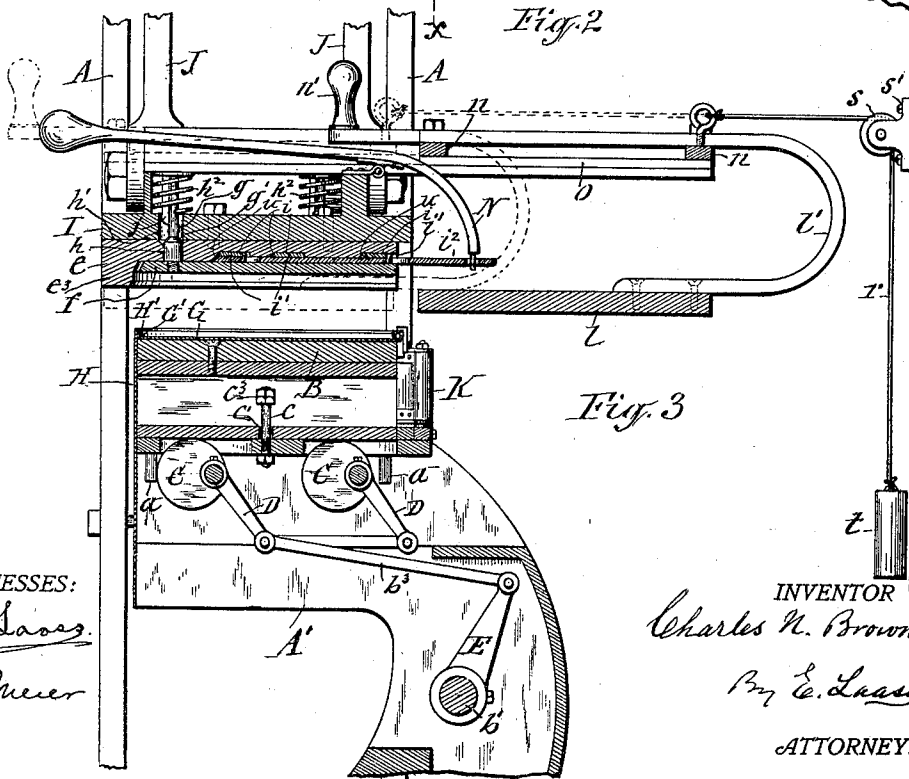
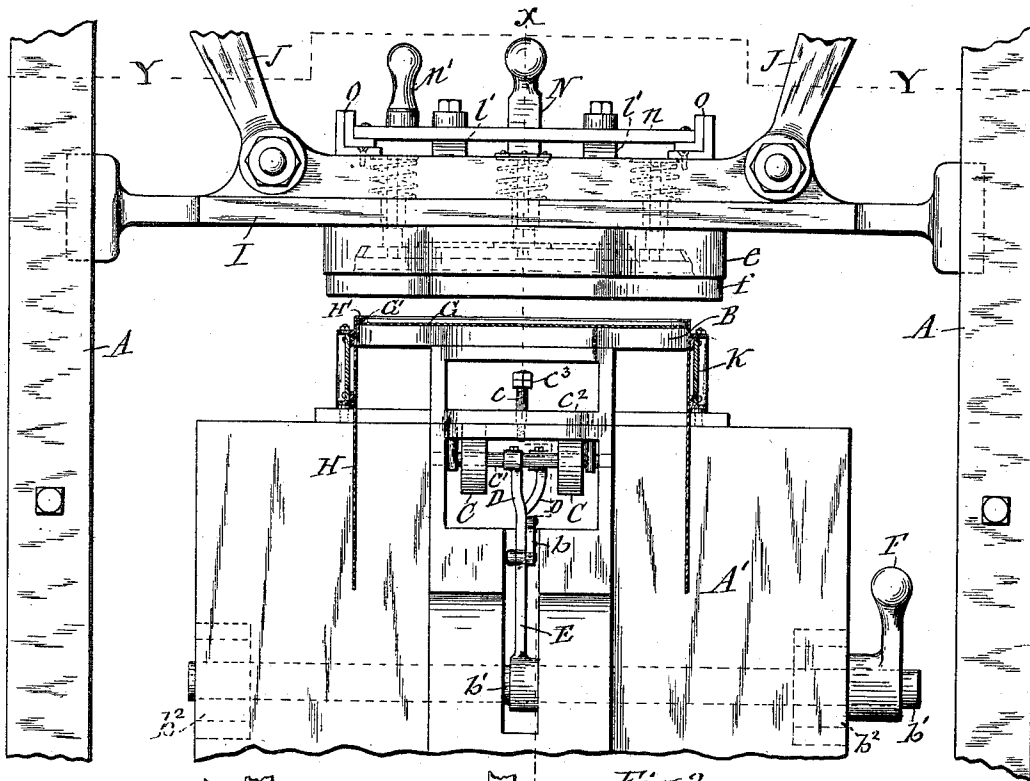
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C. N. BROWN.
MACHINE FOR DOUBLE SEAMING METAL SHEETS.

(Application filed Jan. 6, 1902.)

(No Model.)

6 Sheets—Sheet 2.



WITNESSES:

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(No Model.)

6 Sheets—Sheet 3.

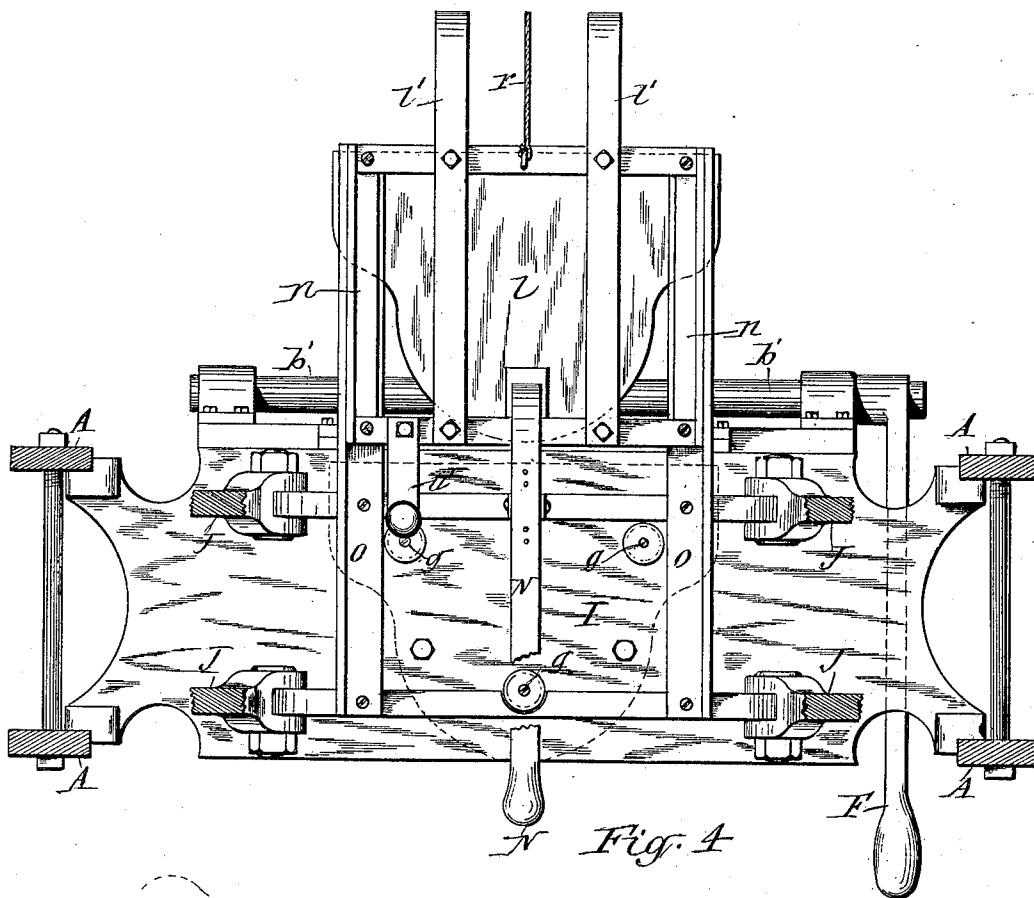


Fig. 4

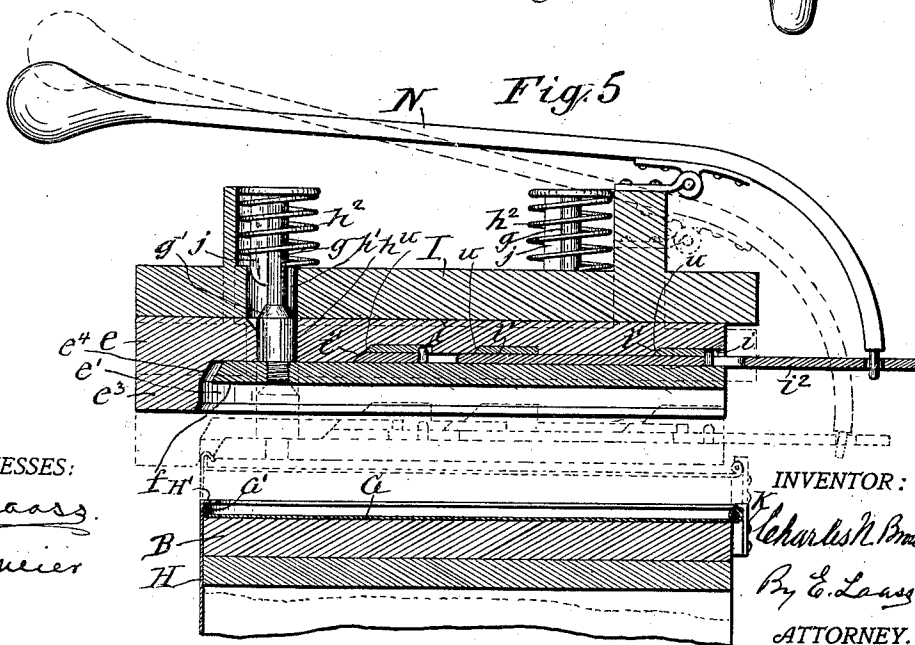


Fig. 5

WITNESSES:

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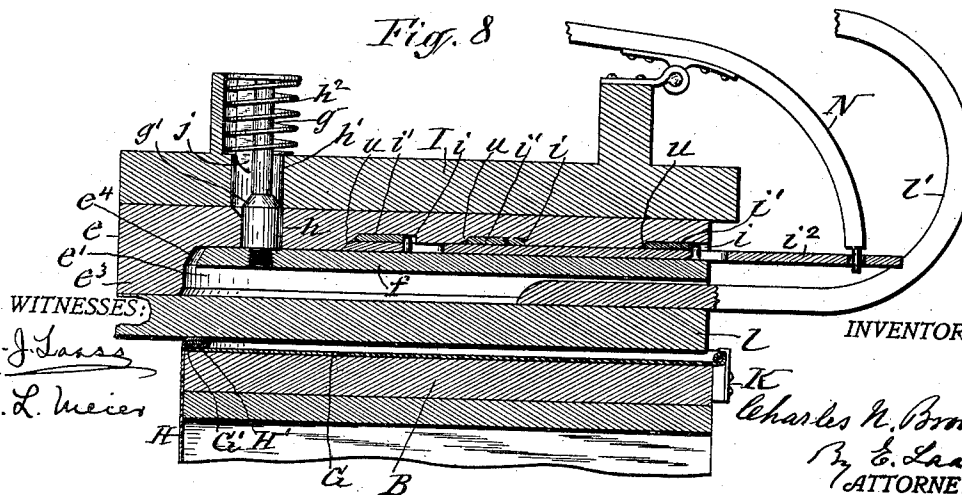
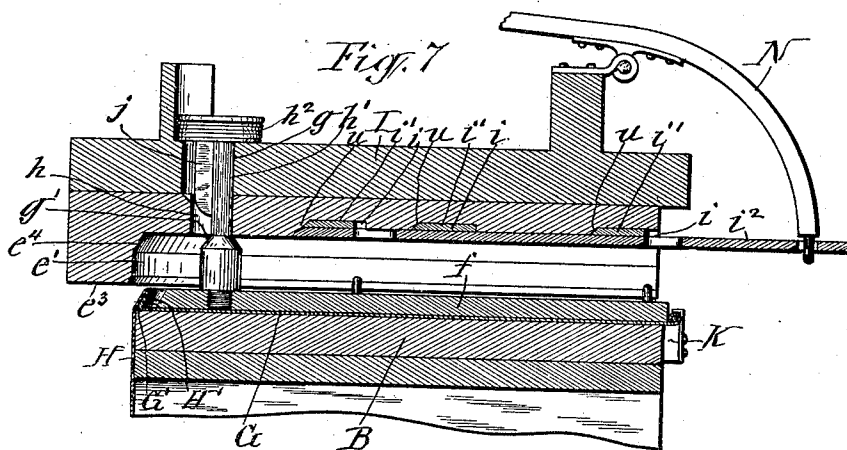
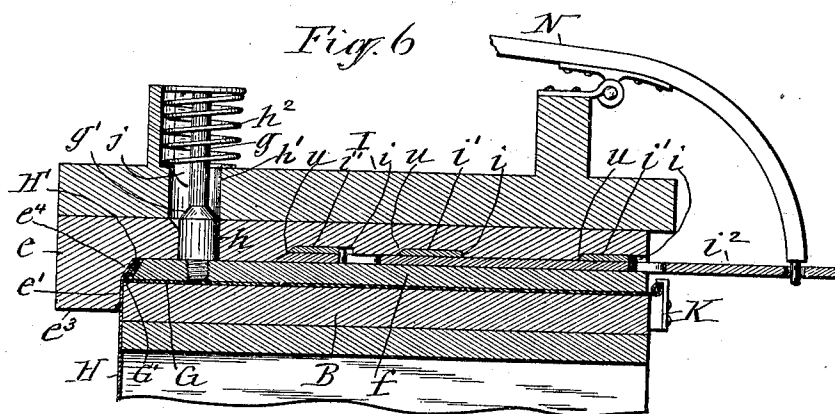
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C. N. BROWN.
MACHINE FOR DOUBLE SEAMING METAL SHEETS.

(Application filed Jan. 6, 1902.)

(No Model.)

6 Sheets—Sheet 4.



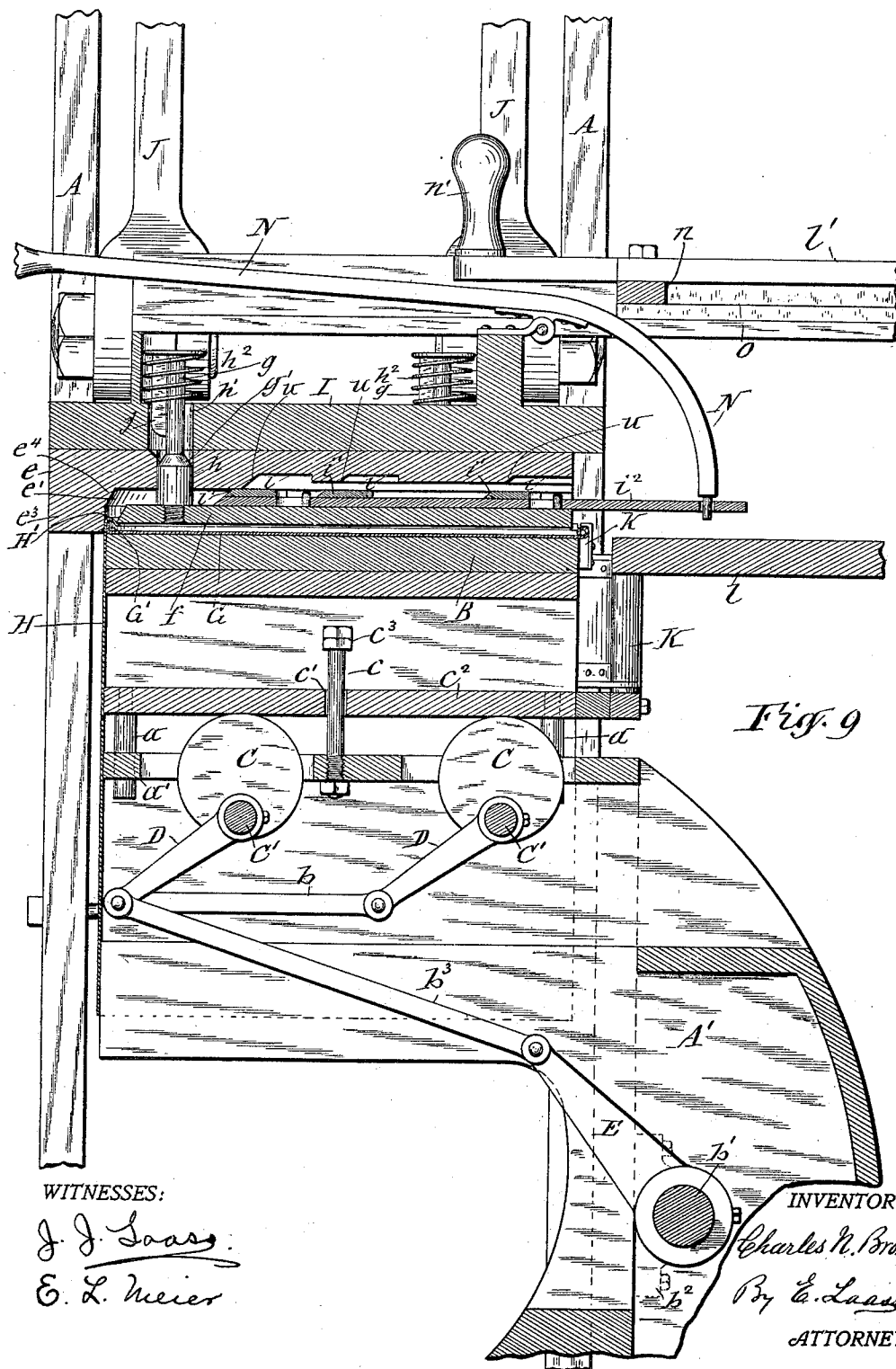
C. N. BROWN.

MACHINE FOR DOUBLE SEAMING METAL SHEETS.

(Application filed Jan. 6, 1902.)

(No Model.)

6 Sheets—Sheet 5.



No. 701,011.

Patented May 27, 1902.

C. N. BROWN.
MACHINE FOR DOUBLE SEAMING METAL SHEETS.

(Application filed Jan. 8, 1902.)

(No Model.)

6 Sheets—Sheet 6.

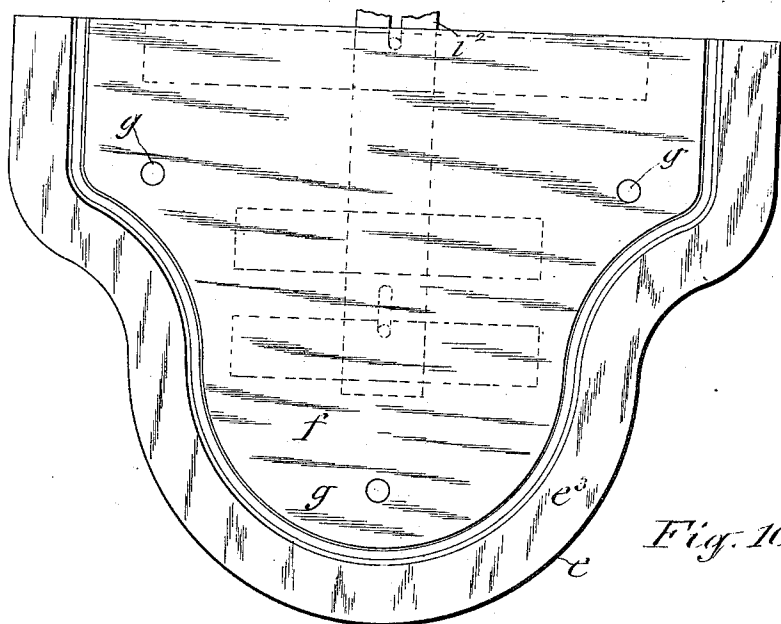


Fig. 10

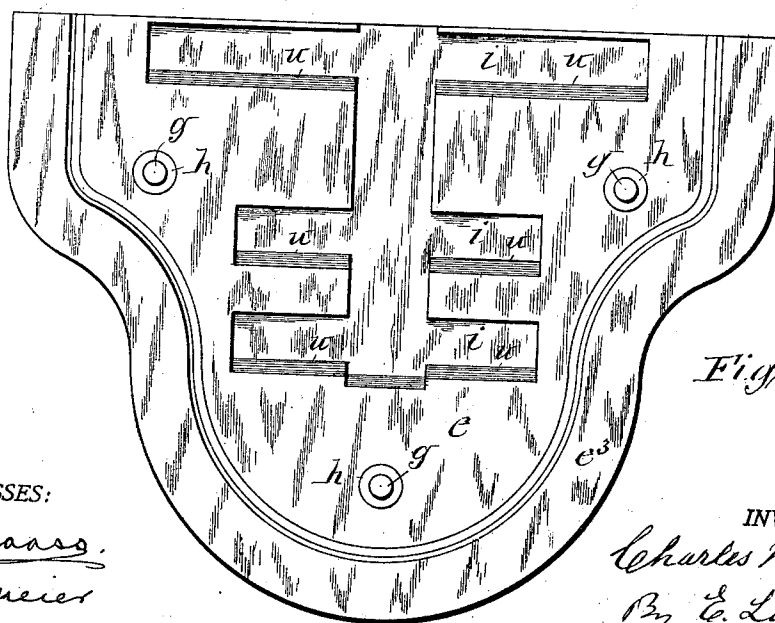


Fig. 11

WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES N. BROWN, OF SYRACUSE, NEW YORK.

MACHINE FOR DOUBLE-SEAMING METAL SHEETS.

SPECIFICATION forming part of Letters Patent No. 701,011, dated May 27, 1902.

Application filed January 6, 1902. Serial No. 88,574. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. BROWN, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Machines for Double-Seaming Metal Sheets, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The purpose of this invention is to expeditiously and effectually join by double seams metal sheets disposed at an angle to each other; and to that end the invention consists in the novel organization of the machine hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a front view of a machine embodying my invention and showing the same with the article operated upon and in its condition at the completion of the double-seaming operation. Fig. 2 is an enlarged front view of the seaming mechanism, showing its condition preparatory to the first step of the seaming operation on the sheets shown in cross-section. Fig. 3 is a vertical longitudinal section in line *xx* in Fig. 2. Fig. 4 is a horizontal section on line *yy* in Fig. 2. Figs. 5, 6, 7, and 8 are further enlarged longitudinal sections of the platen, dies, and press-follower, showing said parts in their various positions during the successive steps in the operation of the machine. Fig. 9 is a still further enlarged vertical longitudinal section of the seaming mechanism in position for bending part way the edges of the sheets to be seamed. Fig. 10 is an inverted plan view of the main and auxiliary dies, and Fig. 11 is a face view of the under side of the main die.

Similar letters of reference indicate corresponding parts.

A represents the main supporting-frame of the machine, which frame includes as one of its constituent parts a pedestal *A'*, rigidly secured to cross-bars *A²*, fastened to the lower portions of the standards of the frame, as clearly shown in Fig. 1 of the drawings.

To the pedestal *A'* is connected the mechanism for raising and lowering the platen *B*, which is directly over the top of the pedestal and suitably shaped to support the metal sheets to be united by the operation of the

machine. Said platen is guided in its vertical movement by pins *a a*, rigidly attached to and depending from the bottom of the platen and passing through eyes *a' a'* in the top plate of the pedestal, as shown in Fig. 9 of the drawings.

For raising and lowering the platen *B*, I prefer to employ eccentrics *C C*, upon which the platen rides. Said eccentrics are fastened to shafts *C' C'*, which are parallel with the platen and pivotally supported in the uprights of the pedestal *A'*. To the shafts *C' C'* are fastened arms *D D*, which are parallel and of even lengths. The free ends of these arms are coupled together by a rod *b* to compel the eccentrics to move in unison. This movement is effected by means of an arm *E*, fastened at one end to a shaft *b'*, mounted in bearings *b²*, attached to the pedestal, as more clearly seen in Fig. 9 of the drawings. The opposite end of the arm *E* is connected by a rod *b³* to one of the arms *D*. A hand-lever *F* is attached to the end of the shaft *b'* for turning said shaft, which causes the arm *E* to transmit motion to the eccentrics *C C* to raise and lower the platen.

To limit the upward thrust of the platen, I employ an adjustable stop *c*, preferably of the form of a vertical bolt, fastened at its lower end to the top plate of the pedestal and passing with its upper end through an eye *c'* in a plate *c²*, carried some distance below the platen and either integral therewith or rigidly attached thereto. The upper end of said bolt is provided with a head *c³*, which by contact with the top of the plate *c²* arrests the upward movement of the platen. The lower end of the bolt *c* is screw-threaded and passes through a correspondingly screw-threaded hole in the top plate of the pedestal *A'*. By turning said bolt it can be made to project a greater or less distance above the top of the pedestal to limit the movement of the platen to a greater or less degree, as may be found necessary.

The invention is more particularly designed for the manufacture of type-writing-machine covers and analogous sheet-metal articles, in which the end sheets thereof are attached at right angles to the sheet forming the body of the article. To allow said sheets to be united by a double seam, the edges of the end sheet

G are formed with outwardly-projecting flanges G' and the end edges of the body-sheet H with inwardly-projecting flanges H', and in placing said sheets in position to be operated on by the machine the end sheet G is to be placed upon the platen B so as to cause the flange G' to project upward and support the sheet H in a suspended position by the flange H' resting upon the top of the flange G', as shown in full lines in Fig. 5 of the drawings. In the operation of forming the double seam with these flanges one of the ends of sheets G is placed flatly upon the platen B with the sheet H hanging by its flange H' upon the edge of the flange G'. Said sheets are held in position on the platen by means of a suitable clamp K, embracing the sheet H. To effect the double-seaming of said sheets, I employ the following mechanisms, viz: I represents the follower of a suitable press, which may consist of toggle-levers J J, connected at their upper ends to the head of the frame A and at their lower ends to the follower I and immediately to right and left threaded nuts L L, in which works a correspondingly-threaded screw L' in the usual and well-known manner. The follower I faces the platen B, and between said parts are introduced the dies employed for successively folding and clenching the flanges G' and H'. The main die *e* is rigidly secured to the bottom of the follower I and is formed in its under side with a recess *e'*, shaped to receive the flanges G' and H' of the plates G and H. The recess *e'* is formed with a surrounding rim *e³*, which is sloped inwardly, as shown at *e⁴*. In the recess *e'* is the auxiliary die *f*, which is sustained therein yieldingly to allow it to be moved laterally as well as vertically. The edges of said auxiliary die are sloped correspondingly to the slope *e⁴* of the rim *e³*.

For lifting the auxiliary die so as to sustain it normally on the face of the recess *e'* I prefer to attach to the said die vertical bolts *g*, which pass through perforations *h* and *h'*, respectively, in the main die *e* and follower I and are provided on their upper ends with heads, between which and the top of the follower are interposed spiral expansion-springs *h²*.

For forcing the auxiliary die *f* down from the face of the recess *e'* in the operation of the machine, as hereinafter described, I provide the face of the recess with parallel grooves *i*, which are beveled at corresponding edges and in corresponding directions, as shown at *u*. Between the two dies are interposed wedge-plates *i' i'*, shaped to enter into the grooves *i i* and attached to a bar *i²*, by means of which said wedge-plates can be moved into and out of the aforesaid grooves. When seated in the grooves, the auxiliary die is allowed to rest on the face of the recess *e'*, and by forcing the wedge-plates out of the grooves said die is depressed from the face of said recess. For moving the bar *i²* I prefer to employ a lever N, fulcrumed intermediate its

ends on the follower I and engaging at one end the bar *i²* and having its opposite end in a convenient position to be operated by the attendant of the machine.

For imparting the lateral movement to the auxiliary die *f* I arrange the perforations *h'* eccentric in relation to the perforations *h* and form the lower end portions of the bolts *g* of a diameter to closely fit in the perforations *h* in the main die. The upper end portions of said bolts are reduced in diameter and beveled at their junctions with the lower end portions, as shown at *g'*. From corresponding sides of the upper end portions of said bolts project wedges *j*, the lower ends of which are at a sufficient distance from the upper ends of the lower end portions of the bolts to allow said portions of the bolts to pass out of the perforations *h h* by the time the wedges *j j* come in contact with the upper ends of said perforations, which contact causes the wedges to crowd the bolts sidewise, and thus move the auxiliary die *f* laterally in the recess of the main die for the purpose hereinafter explained.

The functions of the described main die *e* and auxiliary die *f* are to bend and partly fold the flanges H' and G' of the metal sheets preparatory to compressing and finally clenching said edges in the form of a double seam, which final step in the operation of the machine is effected by means of a die consisting of a horizontal plate *l*. (Shown in operative position in Fig. 8 of the drawings.) This final clenching-die is arranged movable to and from an intervening position between the platen B and main die *e* and is carried by a hanger *l'*, connecting the die *l* to a carriage *n*, mounted on guides *o o*, attached to the top of the follower I, as shown in Figs. 1, 2, 3, 4, and 8 of the drawings. The carriage *n* is provided with a suitable handle *n'*, by means of which the attendant of the machine moves said carriage to carry the clenching-die *l* to and from an intervening position between the platen B and die *e*. I preferably employ means for either assisting or automatically effecting the movement of the clenching-die *l* from said intervening position. One species of such means is shown in Fig. 3 of the drawings and consists of a rope or cable *r*, attached at one end to the carriage *n* and passing thence over a sheave *s*, pivoted to a bracket *s'*, secured to a stationary support and having a weight *t*, attached to the depending end of the rope or cable.

The operation of the described machine is as follows, to wit: First the lever F is to be manipulated to turn the eccentrics C C to a position to lower the platen B, as represented in Figs. 2 and 3 of the drawings. Then the metal sheets G and H to be joined are placed on the platen, with the flanges of said sheets projecting upward, and in this position the sheets are firmly secured to the platen by means of the clamp K embracing the main portion of the depending sheet H. Then the

attendant of the machine causes the platen B to rise, and by operating the lever N he causes the wedge-plates *i* to be shifted from the grooves *i* and depress the auxiliary die *f* from the face of the recess in the main die *e*. Then by setting the press in motion to depress the follower I the auxiliary die is caused to press onto the inwardly-projecting flanges H' of the Sheet H and bend said flanges down to an angle of about forty-five degrees, as indicated by dotted lines in Fig. 5 of the drawings and shown in full lines in Fig. 9 of the drawings. The lever N is then to be operated to move the wedge-plates *i* back into the grooves *i* and allow the spring-actuated bolts *g* to draw the auxiliary die onto the face of the recess *e'*. Then a second downward impulse is to be imparted to the press, which causes the partly inwardly folded flange H', together with the flange G', to be forced into the space between the sloping portion *e'* of the recess *e'* and the sloping edge of the auxiliary die *f*. By this action the flange G' and adjacent portion of the sheet H are bent inward and the flange H' is bent onto the inner side of the flange G', as shown in Fig. 6 of the drawings. The motion of the press is then to be reversed to lift the follower with the main die *e*. In this movement the engagement of the folded flanges of the sheets with the sloping edge of the supplemental die *f* restrains the upward movement of the auxiliary die and causes the bolts *g* to be drawn downward. This causes the lower end portions of the bolts to pass out of the perforations *h* and at the same time brings the wedges *j* of the bolts to come in contact with the upper ends of the perforations *h* and crowd the bolts sidewise, and thereby shift the auxiliary die *f* laterally in the recess of the main die *e*, as shown in Fig. 7 of the drawings. This releases the flanges of the sheets from their engagement with the edge of the auxiliary die, which die is then drawn up into the recess *e'* of the main die by the spring-actuated bolts *g*, as shown in Fig. 8 of the drawings. Said bolts thus resume their normal position and carry the auxiliary die to its original position. The press is then again set in motion to lift the follower I, with the dies *e* and *f*, sufficiently to admit the clenching-die *l* between the platen B and main die *e*, to which position said clenching-die is carried by the attendant moving the carriage *n*. After the die *l* is thus disposed the press is again set in motion to cause the follower to depress the said die with sufficient force to effectually compress and clench the folded flanges of the sheets, as illustrated in Fig. 8 of the drawings. This completes the double-seaming of the sheets.

What I claim as my invention is—

1. A machine for double-seaming metal sheets, comprising a vertically-movable platen for supporting the sheets to be united, eccentrics pivotally supported on the main frame and carrying the platen, means for turning

said eccentrics to impart vertical movement to the platen, a press-follower facing said platen, dies introduced between the platen and follower and shaped to sustain the edges of the sheets at successively-increasing angles, and means for applying pressure to the follower and folding and compressing the edges of the sheets on the dies.

2. A machine for double-seaming metal sheets, comprising a vertically-movable platen for supporting the sheets to be united, shafts disposed beneath and parallel with the platen and pivotally supported on the main frame, eccentrics of corresponding diameters fastened to said shafts, parallel arms of equal length fixed to said shafts, a rod connecting the free ends of said arms, means for imparting reciprocating motion to said rod, a press-follower facing said platen, dies introduced between the platen and follower and shaped to sustain the edges of the sheets at successively-increasing angles, and means for applying pressure to the follower and folding and compressing the edges of the sheets on the dies.

3. A machine for double-seaming metal sheets, comprising a platen for supporting the sheets to be united, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheets carried on the platen and with an inwardly-sloped rim surrounding said recess, a vertically-movable auxiliary die disposed in said recess and having its edges sloped correspondingly to the aforesaid rim to bend the flange of one sheet over the flange of the companion sheet and turn said flanges jointly inward, means for imparting vertical movement to the aforesaid auxiliary die, and means for applying pressure to the follower.

4. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen for supporting the sheets to be united, means for sustaining said platen at different elevations, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheets carried on the platen and with an inwardly-sloped rim surrounding said recess, a vertically-movable auxiliary die disposed in said recess and having its edges sloped correspondingly to the aforesaid rim to bend the flange of one sheet over the flange of the companion sheet and turn said flanges jointly inward, means for imparting vertical movement to the aforesaid auxiliary die, and means for applying pressure to the follower.

5. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen for supporting the sheets to be united, mechanism imparting vertical movement to said platen, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheets carried on the platen and with an inwardly-sloped rim surround-

- ing said recess, a vertically-movable auxiliary die disposed in said recess and having its edges sloped correspondingly to the aforesaid rim to bend the flange of one sheet over the flange of the companion sheet and turn said flanges jointly inward, means for imparting vertical movement to the aforesaid auxiliary die, and means for applying pressure to the follower.
6. In a machine for double-seaming metal sheets, the combination of a platen, a clamp securing to said platen the sheets to be united, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheet lying upon the top of the platen and with an inwardly-sloped rim surrounding said recess, a vertically-movable auxiliary die disposed in said recess and having its edges sloped correspondingly to the aforesaid rim, means for imparting vertical movement to said auxiliary die, and means for applying pressure to the follower as set forth.
7. In a machine for double-seaming metal sheets, the combination of a platen supporting the sheets to be united, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheet lying upon the top of the platen and with an inwardly-sloped rim surrounding said recess and grooves in the face of the recess beveled at corresponding edges and in corresponding directions, a vertically-movable auxiliary die sustained yieldingly in the recess of the main die and having its edges sloped correspondingly to the aforesaid rim, wedge-plates interposed between said main and auxiliary dies, means for moving said wedge-plates into and out of the aforesaid grooves, and means for applying pressure to the follower as set forth.
8. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen, a clamp securing to said platen the sheets to be united, means for imparting vertical movement to the platen, a press-follower facing said platen, a main die carried on the face of the follower and provided with a recess for receiving the sheet lying upon the top of the platen and with an inwardly-sloped rim surrounding said recess and grooves in the face of the recess beveled at corresponding edges and in corresponding directions, a vertically-movable auxiliary die sustained yieldingly in the recess of the main die and having its edges sloped correspondingly to the aforesaid rim, wedge-plates interposed between said main and auxiliary dies, means for moving said wedge-plates into and out of the aforesaid grooves, and means for applying pressure to the follower as set forth.
9. In a machine for double-seaming metal sheets, the combination of a platen supporting the sheets to be united, a press-follower facing said platen, a main die fastened to the follower and provided with a recess for receiving the sheet lying upon the top of the platen and with an inwardly-sloped rim surrounding said recess and parallel grooves in the face of the recess beveled at corresponding edges and in corresponding directions, a vertically-movable auxiliary die sustained yieldingly in the recess of the main die and having its edges sloped correspondingly to the aforesaid rim, wedge-plates interposed between the main and auxiliary dies, a bar connecting said plates to each other, means for moving said bar to carry the wedge-plates into and out of the aforesaid grooves, and means for applying pressure to the follower as set forth.
10. In a machine for double-seaming metal sheets, the combination of a platen supporting the sheets to be united, a press-follower facing said platen, a main die fastened to the follower and provided with a recess for receiving the sheet lying upon the platen and with an inwardly-sloped rim surrounding the recess, an auxiliary die sustained yieldingly in the recess of the main die, springs holding the auxiliary die normally seated on the face of the recess, means for depressing the auxiliary die from said normal position, and means for applying pressure to the follower.
11. In a machine for double-seaming metal sheets, the combination of a platen supporting the sheets to be united, a press-follower facing said platen, a main die fastened to the follower and provided with a recess for receiving the sheet lying upon the platen and with an inwardly-sloped rim surrounding the recess, an auxiliary die sustained yieldingly in said recess and having its edges sloped correspondingly to the rim of the main die, springs holding the auxiliary die normally seated on the face of the recess, means for forcing the auxiliary die in a lateral direction, and means for applying pressure to the follower.
12. In a machine for double-seaming metal sheets, the combination, of a vertically-movable platen, a clamp securing to said platen the sheets to be united, means for imparting vertical movement to the platen, a press-follower facing the platen, a main die fastened to the follower and provided with a recess for receiving the sheet lying upon the platen and with an inwardly-sloped rim surrounding the recess, an auxiliary die sustained yieldingly in said recess and having its edges sloped correspondingly to the rim of the main die, springs holding the auxiliary die normally seated on the face of the recess, means for forcing the auxiliary die in a lateral direction, and means for applying pressure to the follower.
13. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen, a clamp for securing to said platen the sheets to be united, means for imparting vertical movement to the platen, a press-follower facing the platen and provided with vertical perforations, a main die fas-

tened to the follower and provided with perforations disposed eccentric in relation to those of the follower, said main die provided in its under side with a recess for receiving the sheet lying upon the platen and with an inwardly-sloped rim surrounding the recess, an auxiliary die disposed yieldingly in said recess and having its edges sloped correspondingly to the aforesaid rim, bolts attached to the auxiliary die and extending through the aforesaid perforations and having their lower end portions fitted closely in the perforations of the main die and upper end portions reduced in diameter and beveled at their junctions with the lower end portions, springs forcing the said bolts upward, means for forcing the auxiliary die downward from the main die and means for applying pressure to the follower as set forth.

14. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen, a clamp securing to said platen the sheets to be united, means for imparting vertical movement to the platen, a press-follower facing the platen and provided with vertical perforations, a main die fastened to the follower and provided with perforations disposed eccentric in relation to those of the follower, the under side of said main die provided with a recess for receiving the sheet lying upon the platen and with an inwardly-sloped rim surrounding the recess, an auxiliary die disposed yieldingly in said recess and having its edges sloped correspondingly to the aforesaid rim, bolts attached to the auxiliary die and extending through the aforesaid perforations and having their lower end portions fitted closely to the perforations of the main die and their upper end portions reduced in diameter and beveled at their junctions with the lower end portions, wedges projecting from the sides of the upper end portions, expansion-springs interposed between the top of the follower and heads of the bolts, movable wedge-plates interposed between the main and auxiliary dies, a lever for moving said wedge-plates, and means for applying pressure to the follower as set forth.

15. A machine for double-seaming metal

sheets, comprising a platen for supporting the sheets to be united, a press-follower facing said platen, a main die fastened to the follower, an auxiliary die sustained movably under said main die and shaped to partly fold the joining edges of the sheets, means for moving said auxiliary die to different operative positions, and a final clenching-die movable to and from between the platen and main die, and means for applying pressure to the follower as set forth.

16. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen, a clamp for securing to the platen the sheets to be united, means for moving the platen, a press-follower facing said platen, a main die attached to the follower, an auxiliary die sustained movably under the main die and shaped to partly fold the joining edges of the sheets, means for moving the auxiliary die to different operative positions, guides attached to the follower, a frame mounted on said guides, a final clenching-plate suspended from said frame, means for moving said plate to and from between the platen and main die, and means for applying pressure to the follower as set forth.

17. In a machine for double-seaming metal sheets, the combination of a vertically-movable platen, a clamp for securing to the platen the sheets to be united, means for moving the platen, a press-follower facing said platen, a main die attached to the follower, an auxiliary die sustained movably under the main die and shaped to partly fold the joining edges of the sheets, means for moving the auxiliary die to different operative positions, guides attached to the follower, a frame mounted on said guides, a final clenching-plate suspended from said frame, means for automatically moving said plate from the platen, means for forcing said plate between the platen and main die, and means for applying pressure to the follower as set forth.

CHARLES N. BROWN. [L. S.]

Witnesses:

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W. H. MEIER, Jr.