Oct. 25, 1927.

W. B. HEWITT

1,646,533

MACHINE FOR COVERING WOOD WITH SHEET METAL

Filed April 22, 1926

4 Sheets-Sheet 1

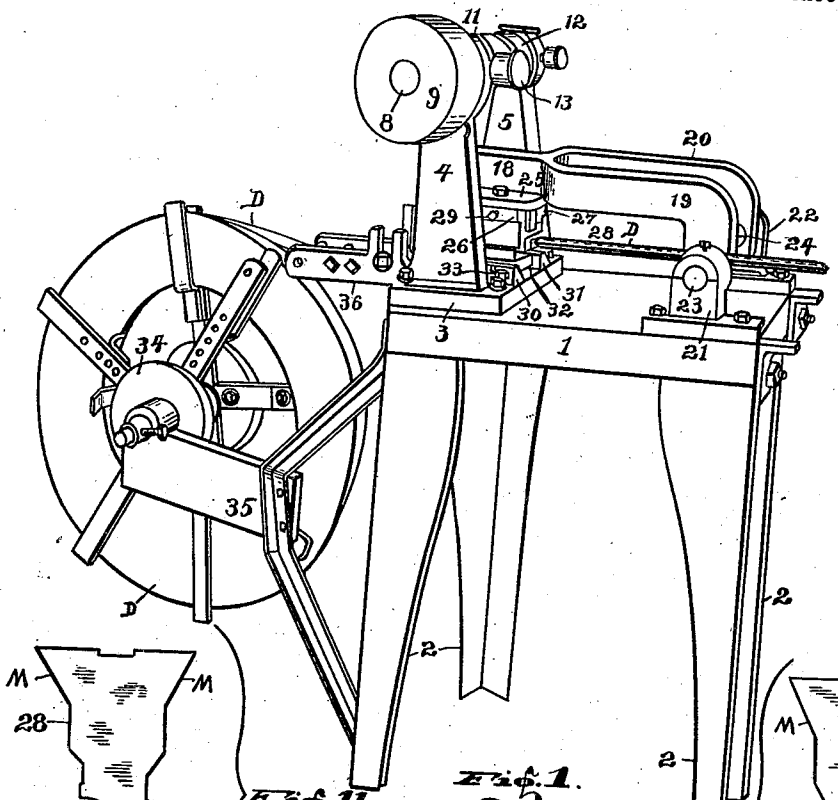


Fig. 1.

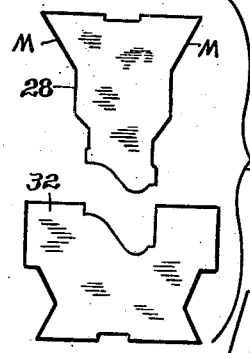


Fig. 11.

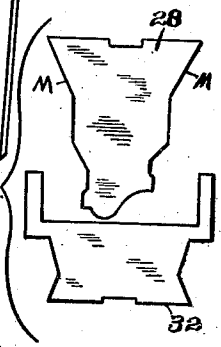


Fig. 14.

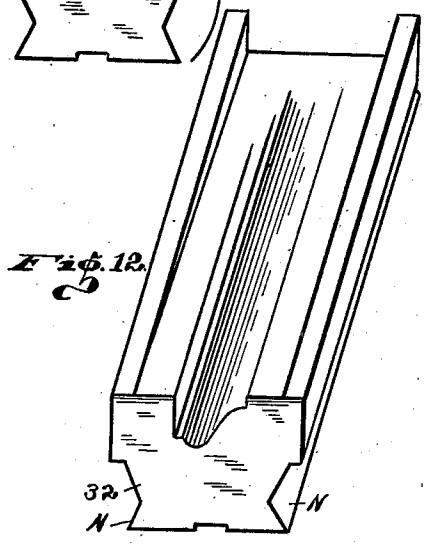


Fig. 12.

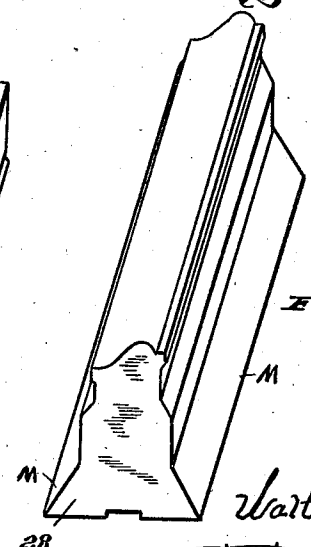


Fig. 13.

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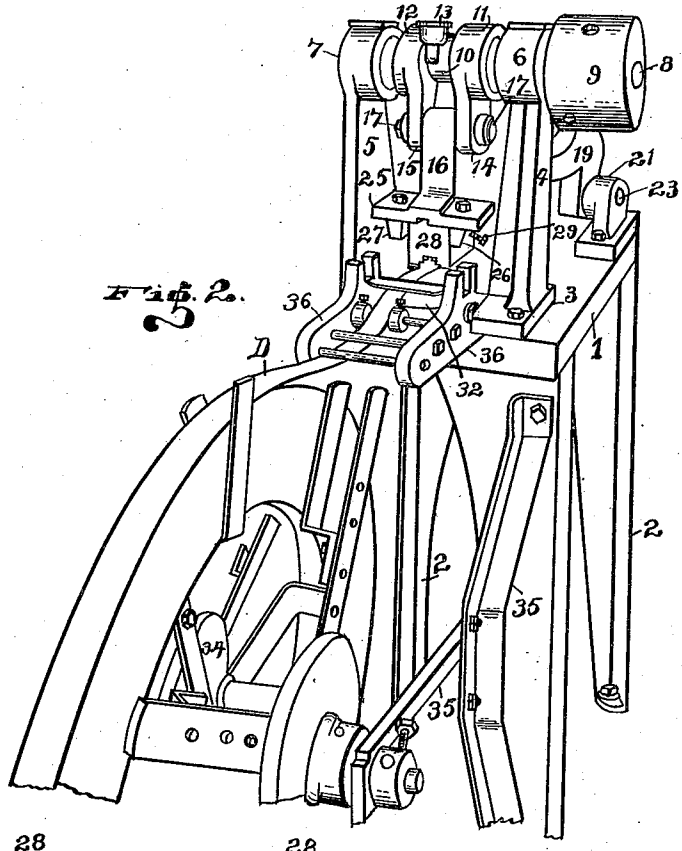
Oct. 25, 1927. 1,646,533

W. B. HEWITT

MACHINE FOR COVERING WOOD WITH SHEET METAL

Filed April 22, 1926 4 Sheets-Sheet 2

Fig. 2.



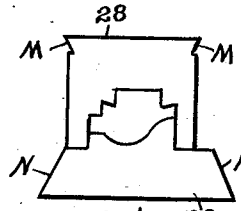


Fig. 7.

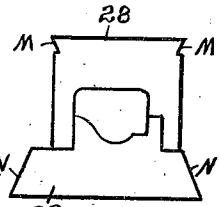


Fig. 8.

Fig. 15.



Fig. 16.

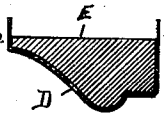


Fig. 17.

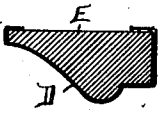


Fig. 9.

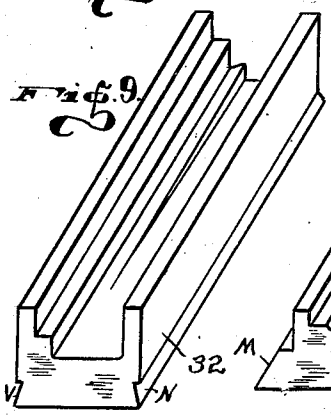
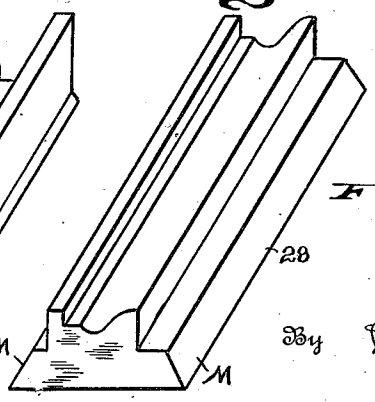


Fig. 10.



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Oct. 25, 1927. 1,646,533

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MACHINE FOR COVERING WOOD WITH SHEET METAL

Filed April 22, 1926 4 Sheets-Sheet 3

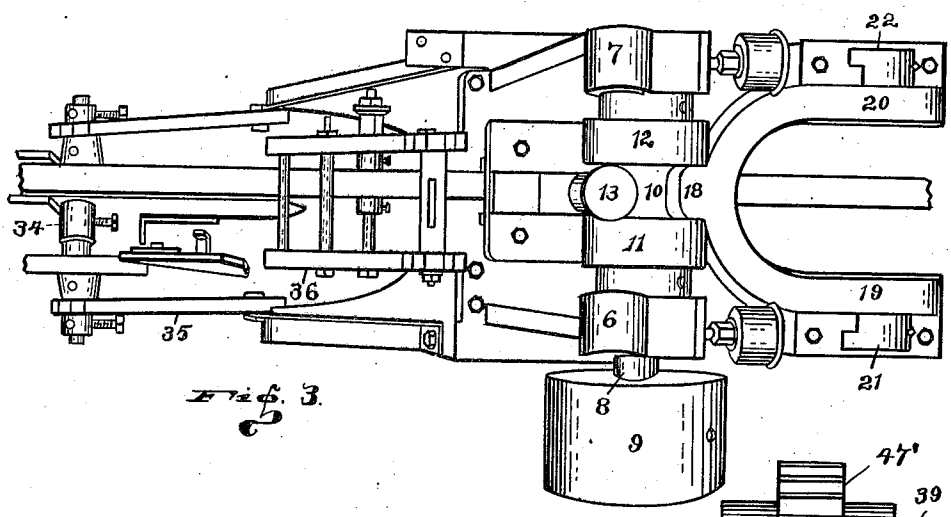


Fig. 3.

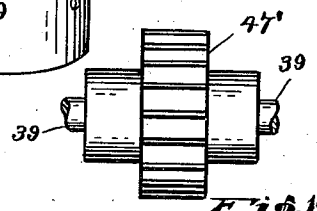


Fig. 16.

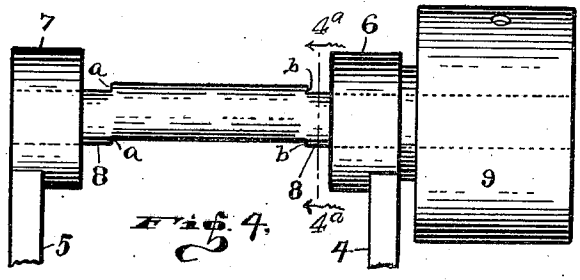


Fig. 4.

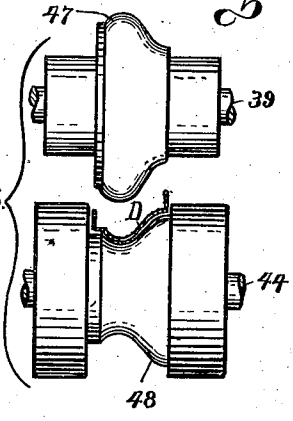


Fig. 6.



Fig. 4a.

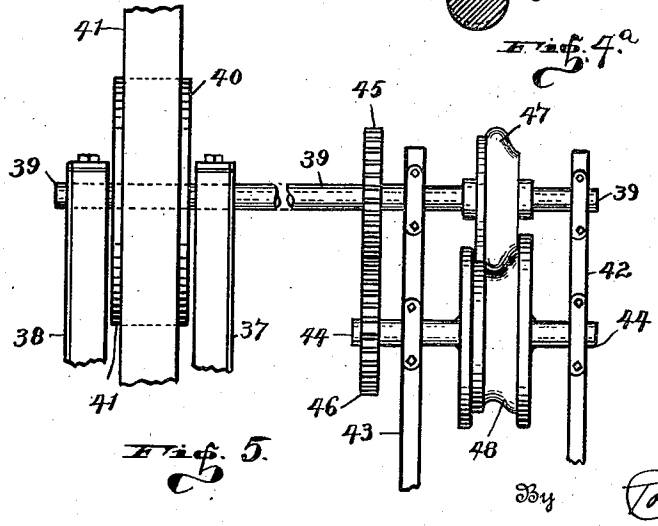


Fig. 5.

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Oct. 25, 1927. 1,646,533

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MACHINE FOR COVERING WOOD WITH SHEET METAL

Filed April 22, 1926 4 Sheets-Sheet 4

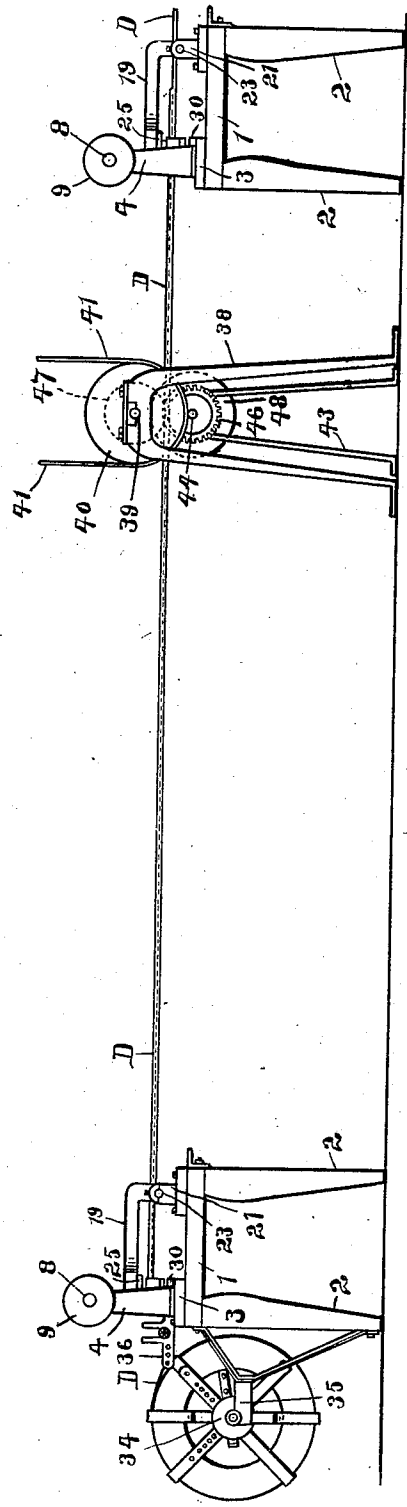


Fig. 19.

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Patented Oct. 25, 1927. 1,646,533

UNITED STATES PATENT OFFICE.

WALTER B. HEWITT, OF RICHMOND, INDIANA, ASSIGNOR TO RICHMOND FIREPROOF DOOR COMPANY, A CORPORATION OF INDIANA.

MACHINE FOR COVERING WOOD WITH SHEET METAL.

Application filed April 22, 1926. Serial No. 103,993.

The object of this invention, broadly stated, is to provide machines for covering wood material, of various shapes in cross section, with sheet metal of various kinds, the same being simple in construction, economical in operation, positive in action, practically automatic in its movements, and which can be manufactured and installed at a comparatively low price.

In the construction of buildings, especially those intended for factory use, it is becoming more realized that everything possible should be done to decrease the fire hazard thereof. One of the most important means for accomplishing this result is to cover all of the wooden parts, as far as possible, with sheet metal. And it has been determined that this can be done more economically and with far better results if each piece of woodstock be so treated before it is built into its final position in a building, or into other parts which finally become a part of the building or device, such for instance as doors, windows, benches, et cetera, which parts finally are installed into connection with the building.

Therefore, to accomplish these results in an economical, efficient, and practical manner with a minimum of cost attached thereto, and at the same time with a maximum of perfection, is the predominant object of this invention.

The results above enumerated are obtained by the employment of machines such substantially as is shown in the accompanying four sheets of drawings, in which—Figure 1 is a perspective right-hand view of one of my machines. Figure 2 is a perspective view of the same, as taken from the front portion thereof. Figure 3 is a top plan view of the same. Figure 4 is a view of the main or cam shaft, together with its bearings and the pulley connected therewith. Figure 4ª is a cross section of the cam shaft, as taken on the line 4ª—4ª of Fig. 4. Figure 5 shows the feeding mechanism alone. Figure 6 shows the feeding rollers or dies in elevation. Figure 7 is an end elevation of the delivery ends of the finishing dies. Figure 8 is an end elevation of the receiving ends of the finishing dies. Figure 9 is a perspective view of the operative face of the lower one of the pair of finishing dies. Figure 10 is a perspective view of the operative face of the upper one of the pair of finishing dies. Figure 11 is an end elevation of the delivery ends of the pair of forming dies. Figure 12 is a perspective view of the operating face of the lower one of the pair of forming dies. Figure 13 is a perspective view of the operating face of the upper one of the pair of forming dies. Figure 14 is an end elevation of the receiving ends of the pair of forming dies. Figure 15 is a cross section of the sheet metal material after it has passed through the forming dies. Figure 16 is a cross section of the sheet metal material after it has passed through the forming dies and with the wood stock to be covered placed therein. Figure 17 represents the completed material after it has passed through the finishing dies. Fig. 18 shows an alternative for the upper roller shown in Fig. 6. And Figure 19 is a side elevation, taken on a reduced scale, showing two of my machines which cooperate with each other to produce a finished product, and showing a feeding device located between the two machines.

Similar indices denote like parts throughout the several views.

In order that the construction, the operation, and the several advantages of the invention may be more fully understood and appreciated, I will now take up a detailed description thereof, in which I will set forth the same as fully and as comprehensively as I may.

As the two machines (shown in Fig. 19) are substantially identical with each other therefore I will designate the several parts by certain indices, and the same parts in the other I will designate by like indices. Also as the machine on the left in Fig. 19 is used first in the operation, therefore I will, when necessary to a clear understanding, refer to it as the "first machine", while the machine on the right I will refer to as the "second machine". Each machine, shown in Fig. 1, includes a bench 1, the same in this instance being supported at the desired elevation by the four legs 2.

Secured on and extending across the forward end portion of the bench is the base 3, from the ends of which are the upwardly extending standards 4 and 5, which carry on their upper ends the respective bearings, or journal boxes, 6 and 7.

Revolvably mounted in the bearings 6 and 7 is the cam-shaft 8. Secured on the pro-

jecting right-hand end of the shaft 8 is a pulley 9, which is adapted to be revolved by power through a belt (not shown) to be connected over the pulley 9 in the usual manner.

As is shown in Fig. 4, the central portion of the cam-shaft 8 is offset, between the shoulders *a* and *b*, with relation to the end portions of the shaft, the central or offset portion of said shaft forming the major portion thereof, while the ends form the minor portion of the shaft, as is clearly indicated in Fig. 4.

Revolvably mounted around the major or central portion of the shaft 8, and extending between the shoulders *a* and *b*, is a thimble 10, and formed integral with the ends thereof are the bearings 11 and 12. Numeral 13 denotes a grease-cup, affording means for lubricating the major portion of the shaft 8 and the thimble 10.

Extending downward from the bearings 11 and 12, and integral therewith and with the thimble 10, are the arms 14 and 15, between which is located the upper portion of the plunger 16, the same being pivotally connected between said arms by the bolt 17, which extends through the lower portions of said arms and the upper portion of the plunger, substantially as shown in Fig. 2.

Formed integral with and extending rearward from the lower portion of the plunger 16 is the stem 18 which merges into the two rearwardly, and then downwardly, extending spaced apart forks 19 and 20. The downwardly extending end portions of said forks are rotatably mounted to the respective bearings 21 and 22, by means of the respective pivots 23 and 24. Said bearings 21 and 22 are rigidly secured to the rear end portion of the bench 1, as shown in Fig. 1.

Extending down from the underside of the plunger 16 and integral therewith is the upper head 25, which has integral therewith the two, spaced-apart bars 26 and 27, which extend forward and rearward.

Contacting with the underside of the head 25 and fitting snugly between the bars 26 and 27, is the upper die 28, the same being adapted to be rigidly secured, as by set-screws 29. Said set-screws 29 are adapted to be run inward to grip the beveled portion M of the upper dies, and by which they are formed removable and interchangeable, for the purpose hereinafter explained.

Extending upward from the face of the base 3, which forms the lower head, are the two spaced-apart bars 30 and 31 which are parallel with and are located directly under the bars 26 and 27.

Contacting with the surface of the base 3, and fitting snugly between the bars 30 and 31 is the lower die 32, which is likewise adapted to be rigidly secured by set-screws 33, whereby it may be removed or interchanged with other dies, as hereinafter explained.

At the front or left of the left-hand machine a reel 34 is provided, and it is revolvably mounted in a frame 35 extending from the forward end of the machine, as shown in Figs. 1, 2, 3 and 19. Said reel is adapted to carry a roll of ribbon of sheet metal D, which is wound into a comparatively large bale, or roll, which is adapted to be mounted concentrically with the reel on which it is located, but is adapted to be drawn therefrom as the reel revolves or, in other words, as the ribbon is drawn off the reel revolves under tension.

Extending out from the front end of the left-hand machine is a tension device 36, consisting of a plurality of small rollers or round bars, between which the ribbon D is threaded, as shown in Fig. 2.

Said metal ribbon D is adapted to be drawn in between the dies 28 and 32 in the manner hereinafter described.

The feeding mechanism, shown in Figs. 5 and 6, may be located any where forward of either machine shown herein.

Numerals 37 and 38 denote standards, the upper ends of which are provided with bearings in which is mounted the horizontal shaft 39. Located between the standards 37 and 38, and mounted concentrically on the shaft 39, is the pulley 40, which is adapted to be rotated by power through the belt 41.

The other end portion of the shaft 39 is supported by two, spaced-apart, standards 42 and 43, the upper portions of which provide bearings for the shaft 39.

Located directly below the shaft 39, parallel therewith, and carried by the standards 42 and 43, is the minor or short shaft 44.

Numerals 45 and 46 denote two gear wheels, which are equal with each other in diameter, and they are meshed together, the former being carried by the shaft 39, and the latter by the shaft 44.

Secured on the shaft 39, and located between the standards 42 and 43, is the main feed roller 47 or 47′; and likewise secured on the shaft 44 is the secondary feed roller 48. The peripheries of the rollers 47 and 48 are complements of each other and they are adapted to fit together and clamp upon the metal D after it has passed between the dies M—N, in the first machine, that is to say—when it is in the form shown in Fig. 15. It is, however, to be understood that the periphery or face of the roller 47 may be straight and parallel with the shaft 39, and its face being corrugated as shown in Fig. 18, whereby it will be adapted to contact with the wood E, that is—when the material is as in Fig. 16.

At this point it might be well to explain that I have shown two sets of dies: Those

shown in Figs. 1, 2, 11, 12 and 13 being hereinafter referred to as the "first set" which are mounted in the second machine; and those shown in Figs. 7, 8, 9 and 10 being referred to as the "second set".

In practice the first set of dies is connected into the machine, as in Figs. 1 and 2, for performing the first operation, and the second set of dies is in like manner connected into the second machine, shown at the extreme right in Fig. 19. This enables one to run the material D through the first machine, that is between the dies shown in Figs. 11, 12 and 13 and this will give the metal D the shape shown in Fig. 15.

Between the two machines the wood stock E is laid in, as shown in Fig. 16. After the wood stock has been laid in then the material is run through the second machine, that is between the dies shown in Figs. 7, 8, 9 and 10, which will lock the wood stock in place and securely locking the metal in connection therewith, and will finish the process whereby the product will appear as shown in Fig. 17.

In practice the shaft 8 is to be revolved at comparatively high rate of speed, while the shaft 39 is revolved at a relatively slow rate of speed. However as the three units sit end to end they may all be connected to the same line shaft, and the relative speed of the units may be governed by the sizes of the drive and the driven pulleys.

It will be realized that the upper dies will be moved directly up and down, or vibrated, at a high rate of speed amounting to rapid hammering, combined with a maximum of force, whereby the metal strip D, as it is fed into the front end of the machine between the dies, as they appear in Fig. 14, will be hammered gradually but firmly to the required shape of the faces of the dies at their rear ends, Fig. 11, thereby causing it to emerge from said dies in the shape shown in Fig. 15.

In order to start the metal through the dies the end of the metal strip D is taken from the roll flat, and forced manually between the dies (as at Fig. 14) until sufficient material has passed therebetween whereby it can be entered between the rolls 47 and 48, thereafter the operation of the shaft 39 will cause the rollers 47 and 48 to pull the material with proper force to draw it through the first set of dies, and then force it (with the wood stock therein) through the second set of dies of the second machine. After passing through the first set of dies the wood stock is laid therein, as in Fig. 16, after which the material with the wood stock therein is entered between the second set of dies, at the end thereof which is shown in Fig. 8, and emerge therefrom at the end thereof shown in Fig. 7. The second set of dies merely bend the edge portions of the metal, which stand up as shown in Fig. 16, down into contact with the back of the wood stock to the position shown in Fig. 17.

It is to be understood that the product shown in Fig. 17 is only an example thereof, as a great variety of material may be employed with various shapes and sizes, only requiring that there be dies provided to conform with the shape desired, that is depending on the shape and the size of the wood stock to be covered.

It is to be understood that various changes may be made in the several details herein set forth without departing from the spirit of the invention, and without sacrificing any of the advantages thereof which are new and useful.

Having now fully shown and described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A machine substantially as set forth comprising a pair of dies whose faces are of varying contour from end to end thereof and adapted to approach near together, means for rigidly securing one of said dies in fixed position, means for imparting to the other one of said dies a vibrating movement at right angles to the fixed die, said dies being adapted to receive a strip of sheet metal therebetween, means for moving said strip of sheet metal between the dies whereby it will receive a predetermined shape depending on the contour of the dies, and a second set of dies between which said metal, after having been formed in the first dies, is passed to secure the metal to wood stock placed in connection therewith.

2. A machine for covering wood stock with sheet metal comprising, a base, a pair of standards extending upward from the base, as eccentric shaft revolvably carried by said standards, means whereby said shaft may be revolved by power, a thimble surrounding the eccentric portion of the shaft between said standards, a plunger pivotally connected to said thimble, a head carried by the lower end of the plunger, an upper die, means for detachably connecting said die to the under side of said head, arms integral with said head and extending to the rear therefrom, means for pivotally connecting the rear ends of said arms, a lower die, means for detachably connecting the lower die on the base and directly under the upper die, said dies being adapted to receive a strip of sheet metal therebetween to be formed thereby into the desired shape.

3. A machine for covering wood with sheet metal, comprising a bench, a base secured on the bench, a pair of standards extending upward from the base, bearings carried by the upper ends of the standards,

an eccentric shaft revolvably mounted in said bearings, the eccentric portion of said shaft being between said bearings, a pulley carried by the outer end of said shaft, a thimble surrounding the eccentric portion of the shaft, spaced arms extending downward from the thimble, a plunger pivoted between said arms, a head carried by the lower end of the plunger, bars integral with the under face of said head, a stem extending back horizontally from said head, arms extending back from the stem and pivoted to the bench at a distance from the base, a die member adapted to be detachably secured between said arms, a lower pair of bars extending upward from the base, a second die member adapted to be detachably secured between said lower pair of bars, said dies being complements of each other for forming sheet metal passing therebetween, a reel for containing the sheet metal stock, and a tension device for the sheet metal stock located between the reel and the dies.

4. A machine including a relatively fixed die-member, a movable die-member, the faces of said die members being complements of each other and adapted to nest together, means for imparting to the movable die-member vibrating movements at right-angles to the fixed die member, said die members being adapted to receive a strip of sheet metal therebetween to be formed of the curvature, in cross section, of the faces of the die members at their discharge ends; a second machine having a fixed die-member, a movable die-member, the faces of the said die members of the second machine being complements of each other and adapted to nest together and of a contour different from the contour of the faces of the die-members of the first machine, means for imparting to the movable die-member of the second machine vibrating movements at right-angles to the fixed die-member of the second machine, the die members of the second machine being adapted to receive therebetween the material formed by the die-members of the first machine and impart thereto the contour, in cross-section, of the faces of the die-members of the second machine in addition to that part of the contour imparted by the dies of the first machine, and means located between said machines for feeding the material forward.

5. Means for covering wood stock with sheet metal, comprising a first machine including a base, a pair of standards extending upward from the base, an eccentric shaft carried by said standards, means whereby said shaft may be revolved by power, a thimble surrounding the eccentric portion of said shaft between said standards, a plunger pivotally connected to said thimble, a head on the lower end of said plunger, an upper die, means for connecting said die to the under side of said head, arms integral with said head and extending rearwardly therefrom, means for connecting the rear ends of said arms, a lower die, means for connecting the lower die to the base and directly under the upper die, said dies being adapted to receive a strip of sheet metal therebetween; a second machine located at a distance from the first machine and substantially identical therewith but with the faces of the dies of the two machines of a contour, in cross section, different from each other, a reel for containing the sheet metal stock connected with the receiving end of the first machine, a tension device connected with the receiving end of the first machine, and a feeding device located between the two machines.

6. The herein described means for forming sheet metal stock and securing it into connection with wood stock, comprising two spaced apart machines, a fixed die and a movable die carried by each of the machines, means for imparting vibrating movements to the movable dies with the sheet metal stock between the two dies of the first machine which are adapted to form the sheet metal stock to receive the wood stock, the dies of the second machine being adapted to receive the sheet metal stock with the wood stock laid therein and to secure the sheet metal stock to the wood stock by bending the sheet metal stock into engagement therewith, means for feeding the material through the machines, and means for operating the first machine, the second machine, and the feeding means as a unitary structure.

WALTER B. HEWITT.