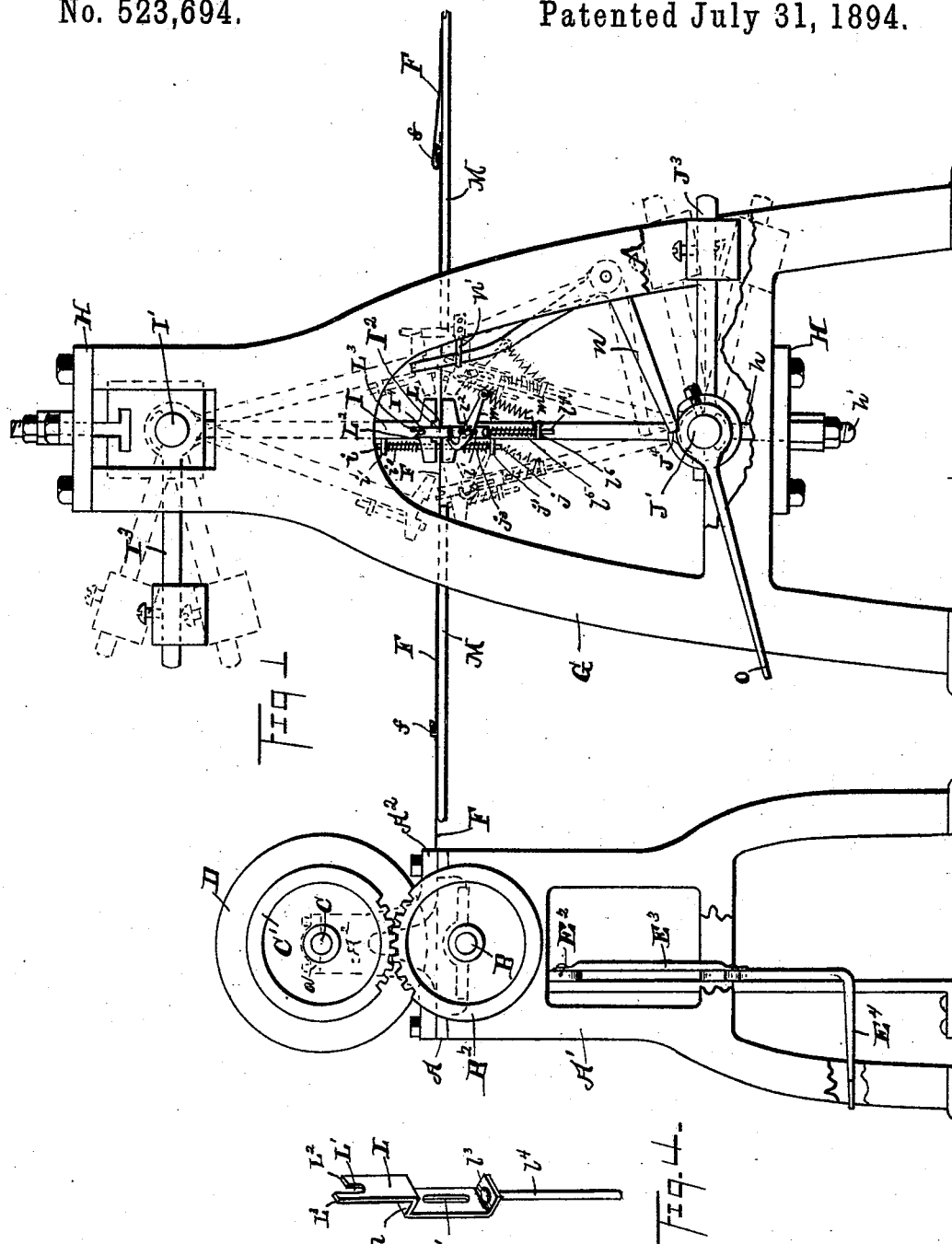


2 Sheets—Sheet 1.

E. N. THOMPSON, Administrator.

No. 523,694.

Patented July 31, 1894.



Belle S. Lowrie.

A. S. Lowrie.

Frank T. Thompson

By Geo. W. King. ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

F. T. THOMPSON, Dec'd.

E. N. THOMPSON, Administrator.

MECHANISM FOR SEAMING AND COILING SHEET METAL.

No. 523,694.

Patented July 31, 1894.

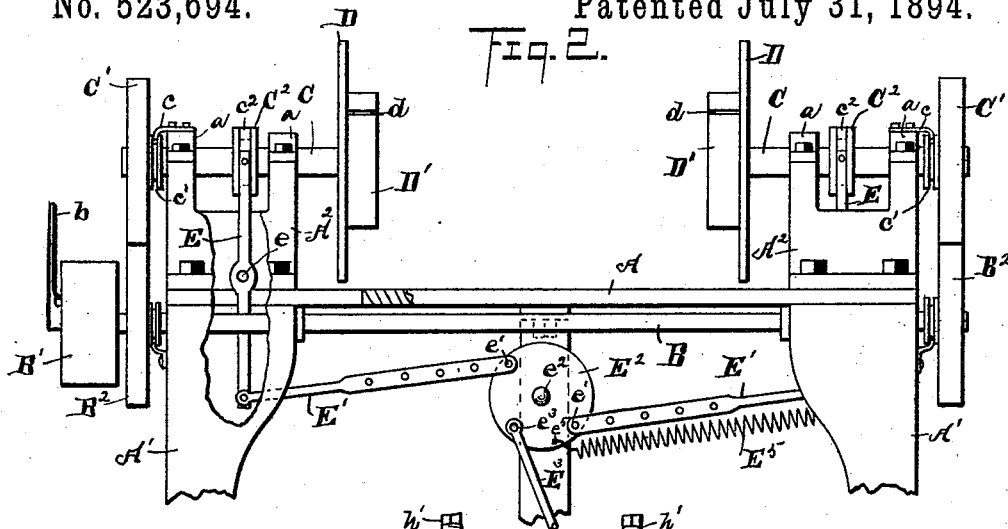
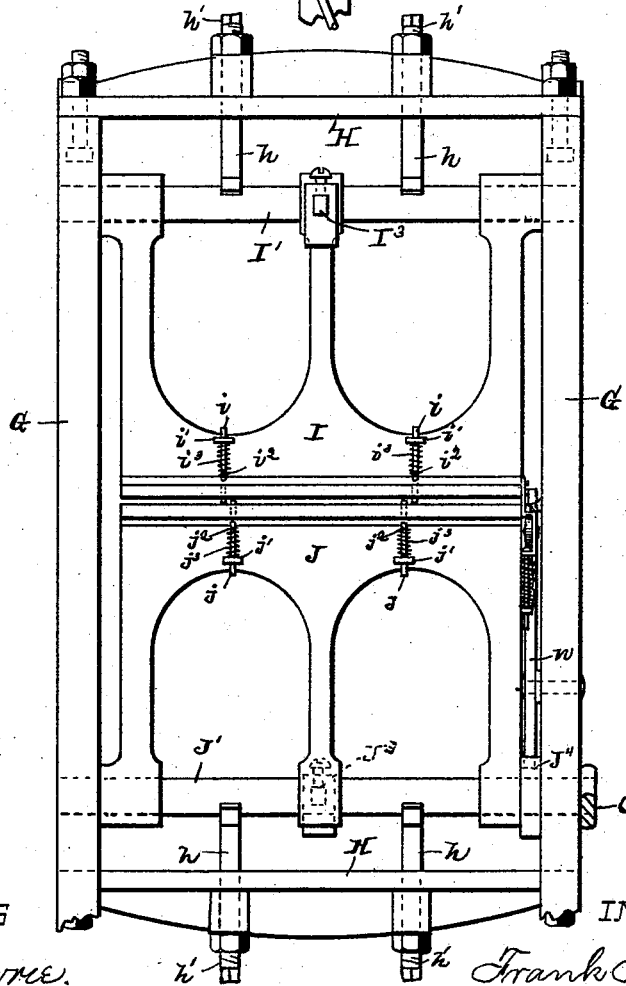


Fig. 3.



WITNESSES

Bell & S. Lowrie.

A. C. Lowrie.

INVENTOR.

Frank T. Thompson

By Geo. W. King, ATTORNEY

# UNITED STATES PATENT OFFICE.

FRANK T. THOMPSON, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO  
EUSTACE N. THOMPSON, OF SAME PLACE; E. N. THOMPSON ADMINIS-  
TRATOR OF SAID FRANK T. THOMPSON, DECEASED.

## MECHANISM FOR SEAMING AND COILING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 523,694, dated July 31, 1894.

Application filed February 25, 1893. Serial No. 463,771. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK T. THOMPSON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and  
5 useful Improvements in Mechanism for Seaming and Coiling Sheet Metal; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it  
10 pertains to make and use the same.

My invention relates to improved mechanism for seaming and coiling sheet metal, such for instance as metal roofing, the object being to provide a reel operated by power for the  
15 purpose of coiling the metal, the heads of the reel being moved farther apart by means of a foot-treadle, whereby the coil of material is discharged by gravity. Also the power of the reel is made to operate an automatic seaming  
20 device so that no manual labor is required or time lost in seaming.

In the accompanying drawings: Figure 1 is a side elevation of mechanism embodying my invention, with portions broken away to show  
25 the construction of parts, that would otherwise be obscured. Fig. 2 is an elevation of the reel as seen from the right hand, portions being broken away to reduce the size of the figure. Fig. 3 is an elevation of the seaming  
30 mechanism as seen from the right hand if the reel were removed, portions of this figure being broken away for reasons aforesaid. Fig. 4 is a perspective view of latch L.

A represents the bed plate of the reel, this  
35 bed serving as a table on which to discharge the roll of finished material. The bed is mounted on legs A', or on any suitable supporting frame. Underneath the bed is located the driving shaft B. This shaft is provided  
40 with a driving pulley B'. On shaft B are mounted spur gears B<sup>2</sup> B<sup>3</sup>, and these gears engage gears C' C', that are mounted respectively on spindles C, C, each spindle and its gear being provided with groove and splines so  
45 that the spindle can slide endwise through the gear.

A<sup>2</sup> A<sup>2</sup> are pillow blocks adjustably secured on top of bed A, so they may be shifted toward and from each other to accommodate  
50 material of different widths, and at the top of

these pillow-blocks are located the journal boxes *a a* for spindles C, C.

The hub of each gear C' is grooved circumferentially as at *c'*, and these grooves are engaged by the bent ends of irons *c*, these irons  
55 being secured respectively to the adjacent pillow-blocks, whereby in sliding the spindles endwise the gears maintain their positions next the pillow-blocks.

On the inner ends of the spindles C are  
60 mounted disks D, each disk having an inwardly projecting annular flange D', on which the sheet metal is wound, each flange having a slit *d* for engaging the hook ends, that is, the doubled back ends of the advance sheet. On  
65 each spindle C is mounted a collar C<sup>2</sup>, each of these collars having a circumferential groove *c*<sup>2</sup>. These collars are so arranged that by engaging the inner boxes *a*, they serve as stops to limit the inward movements of the spin-  
70 dles, so as to bring the disks D the right distance apart to admit the sheet of metal widthwise between them.

Grooves *c*<sup>2</sup> are engaged by the forked ends of levers E, these levers being fulcrumed as  
75 at *e*. The lower ends of levers E are connected by rods E' with disk E<sup>2</sup>, the latter being journaled on stud *e*<sup>2</sup>. The pivotal connections *e'*, as between rods E' and the disk, are located diametrically opposite each other.  
80

E<sup>3</sup> is a rod pivoted at *e*<sup>3</sup> to the disk, this rod E<sup>3</sup> connecting with the foot-treadle E<sup>4</sup>, and by depressing this treadle and by means of the connecting mechanism just described, the  
85 spindles C are moved outward and farther apart to discharge the coil of material. When the pressure is removed from the treadle, the parts reverse, that is, are returned to their normal positions by the recoil of spring E<sup>5</sup>, this spring being fastened at *e*<sup>5</sup> to the disk,  
90 the other end of the spring being fastened to the side frame of the machine.

The different sheets of metal F, having previously been doubled back at the ends, are  
95 laid on a long table M, this table being usually constructed of wood. The hook ends of these sheets are locked together as shown in Fig. 1, and the hook end of the advance sheet having been placed by hand in slits *d*, the  
100 reel is set in motion to wind the strip of metal

thereon. When this is accomplished, the reel is stopped, binding wires are applied to the coil, after which, by means of the treadle, the bundle of material is discharged from the machine, such a discharge of material, and returning the parts to their normal positions, ready for another operation, requiring but a moment of time.

The joints  $f$  where the different sheets of metal interlock have to be pressed together, or seamed, as this operation is called. Heretofore the seaming mechanism was usually operated by hand, requiring one man to attend to this operation, and during the seaming of each joint, the reel had to be stopped. In order to save one man's labor and to save time, I have devised the automatic seaming mechanism which I will next describe.

G, G, are heavy side frames, usually cast from the same pattern, and set facing each other. These side frames are rigidly connected by means and cross bars H H, these cross bars having been cast from the same pattern.

I and J are metal frames, cast from the same pattern, each frame being mounted on an axial shaft respectively  $I'$ ,  $J'$ . These shafts are journaled in suitable boxes connected with the side frames, and located the one above the other so that the frame I and J may swing a limited distance lengthwise the table, and the upper boxes being adjustable vertically to adjust the free edges of these frames to the desired distance apart, so that when these frames are in line extending toward each other they will engage the sheet of metal that is between them. The faces, that is, the free edges of these swinging frames, that, for convenience, I will call toggles, are turned off with the shaft of each as a center.

The face of the upper toggle (I) is grooved lengthwise thereof as at  $I^2$ , the groove being broad enough to receive a joint  $f$  of the metal sheet, and the groove being so shallow that the joint is compressed as the toggles swing into line, and as this occurs the one side wall of groove  $I^2$  off-sets downward the upper sheet, so that the two sheets, after the operation, known as "seaming," are in the same plane and consequently will lie flat upon the roof for which they are intended. As the toggles will likely be subjected to considerable pressure in seaming, and to prevent the consequent spring of shafts  $I'$ ,  $J'$ , crossbars H H are provided with forked steady pins as at  $h$ , the prongs of these steady pins setting astride the shafts ( $I'$ ,  $J'$ ) the pins extending with easy fits into sockets in the cross-bars, each steady pin being backed by a screw  $h'$ . The toggles as they swing forward, that is, toward the left hand, to do their work, are actuated by the strip of metal that is being wrought upon by the toggles, and at the same time is being wound upon the reel. Each toggle is provided with a weighted arm respectively  $I^3$ ,  $J^3$ , and as the toggles approximate the position shown in dotted lines at

the left hand in Fig. 1, the toggles one at a time are returned to the place of beginning, shown in dotted lines at the right hand in Fig. 1. To accomplish this I provide as follows: The broader, face bearing section of the upper toggle, is pierced just at the left hand side of the groove  $L^2$ , to receive with easy fits the pins  $i$ . The upper end of these pins extends with an easy fit through holes in lugs  $i'$ .

Pins  $i$  are provided with cross pins  $i^2$ , the latter serving as stops to limit the depression of pins  $i$  so that these pins may protrude, say an eighth of an inch, more or less, below the face of the upper toggle. Between pins  $i^2$  and lugs  $i'$  are springs  $i^3$ , these springs acting downward on pins  $i$ , but these latter pins may be pressed upward against the action of their springs until the lower ends of these pins are flush with the face of the toggle. The lower toggle is provided in like manner with spring actuated pins  $j$ , constructed in the manner just described, these pins being thrust upward by the action of their springs until they protrude, say an eighth of an inch above the face of the lower toggle.

With the toggles at their normal, or right hand position, and with the strip of metal being drawn through between the toggles, by the action of the reel, if the seam be on top, the seam will engage pins  $i$ , or if the seam be underneath, the seam will engage pins  $j$ , and by such engagement, either the top or the bottom toggle would be swung forward.

To cause the two toggles to swing forward in unison, I provide the upper toggle with a pin  $I^4$ , projecting from the end of the toggle. The other toggle is provided with a spring actuated latch L, movable endwise, for engaging pin  $I^4$ , whereby the toggles are caused to move forward in unison. Perspective view of this latch is shown in Fig. 4. The upper end of the latch has a notch  $L'$  adapted to fit pin  $I^4$ , with a short lip, or side wall  $L^2$  on the right hand side of the notch, and with a longer lip,  $L^3$ , on the left hand side of the notch. Latch L is off-set, inward, at  $l$  so as to lie flat on the arm of the toggle, and below this off-set or shoulder, the latch has an elongated hole  $L'$ , through which hole operates the securing stud  $L^2$ , this stud being screwed into a threaded hole in the toggle arm. Below this, the latch is bent outward, as at  $L^3$ , and from thence downward, the latch is substantially a round rod, as at  $L^4$ , with a spring  $L^5$ , coiled around this rounded section, the spring actuating upward on the latch. The lower end of section  $L^4$  extends with an easy fit through a hole in lug  $L^6$  for holding the lower end of the latch steady.

With the toggles in their right hand positions, and with the latch engaging pin  $I^4$ , it is evident, that if either toggle be swung forward, the other toggle will move in unison therewith. As the toggles are farthest apart at the commencement of such forward movement, and as they approach nearest to each

other as the toggles reach the center line, and are in line with each other, it follows, that latch L will by its engagement with pin I<sup>4</sup>, be depressed by such forward movement, and the maximum depression of the latch will occur as the toggles come in line with each other, and if there were nothing to interfere with the latch, the latter by the action of its spring would, gradually rise and keep its engagement with pin I<sup>4</sup> as the toggles swung forward from the center line, in which case, the toggles would return together. But such simultaneous return of the toggles is not desirable, because if the sheet of metal between them happened to be somewhat corrugated or otherwise uneven, the toggles would likely pinch the sheet to such an extent as to retard, or stop such return movement. I therefore provide for the return of the upper toggle, first, followed immediately after by the return of the lower toggle. To accomplish this on stud I<sup>4</sup> is pivoted a dog m of the hook variety. The tail end of the dog is provided with a spring m' for depressing the same. The hook end of the dog is inclined on top, and with the downward movement of latch L, the upper side of the shoulder l engages and snubs back the dog, but as the center line of the toggle is reached, the dog hooks over shoulder l and from thence onward in the forward movement of the toggles, the dog holds the latch in its depressed position.

As a result of the latch being held down, when the toggles reach their extreme forward movement, where the pins i and j become disengaged from the seam, the lower toggle being held, for a moment, by the engagement of dog n with notch J<sup>4</sup> of shaft J', the upper toggle may return rearward to the place of beginning by reason of pin I<sup>4</sup> passing above lip L<sup>2</sup> of the latch. There is a pin, lug, or stop of some kind, not shown, but connected with the adjacent side frame to limit the rearward movement of the upper toggle, and just before this point is reached, the upper toggle engages the tail end of the dog n, and by such engagement disengages the head of the dog from notch J<sup>4</sup>, whereupon the lower toggle returns to the place of beginning, and lip L<sup>2</sup> by its engagement with pin I<sup>4</sup>, stops the lower toggle in exact position relative to the upper toggle, and just as, or an instant before this occurs, a stationary rod n', that is fastened to the side frame, engages dog m above the fulcrum thereof, and snubs back this dog, and releases the latch, whereupon the latch, by action of its spring is projected upward until notch L' engages pin I<sup>4</sup>, thus locking the toggles together ready for another operation.

Sometimes where a short sheet is at the front end of the metal strip and is being wound and seamed, if such sheet were so short

that it would have been wrapped but little way around the reel, while the seam engaged the toggles, the hook end of the sheet might straighten out where it hooked on to the reel, owing to the strain caused by operating the toggles, I have therefore provided a foot lever O, mounted on the overhanging end of shaft J', and by bearing down on this lever, the toggles could wholly or in part be operated by such lever.

Sometimes the forward sheet is so short that it will not reach from the toggles to the reel, in which case, the toggles in seaming the first joint, are of necessity operated by lever O.

What I claim is—

1. A reel for coiling sheet metal, such reel comprising spindles set in line with each other, and having end play, such spindles being journaled in head blocks the latter being adjustable toward and from each other, connecting mechanism substantially as described for simultaneously moving the spindles farther apart by means of a foot-treadle, a spring for reversing or returning the parts, substantially as described.

2. A seaming device automatically actuated by the successive joints in the sheets of metal passed between the toggles, the face of one toggle having a groove for seaming purpose, spring-back-pins protruding from the faces of the toggles, a spring actuated latch for coupling the toggles, so that the toggles advance in unison, substantially as and for the purpose set forth.

3. In combination, opposing swinging frames or toggles, the face of one toggle bearing a groove, the two toggles being coupled by a spring latch, a spring actuated dog for engaging and holding the latch in its depressed position, an abutment arranged to snub back such dog at or near the terminus of the return movement of the toggles, substantially as and for the purpose set forth.

4. In combination, opposing swinging frames or toggles adapted for seaming purposes, pins connected with the toggles in position for engaging the passing joint of the sheets of metal passing between the toggles, a dog for holding the one toggle pending the return of the other toggle, the tail of such dog being in position to be snubbed back by the return of the first toggle, substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 14th day of February, 1893.

FRANK T. THOMPSON.

Witnesses:

GARDNER P. NASH,  
FRANK REISSINDER.