

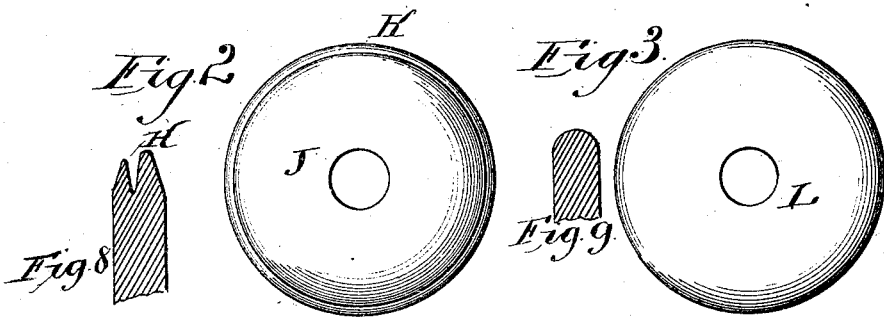
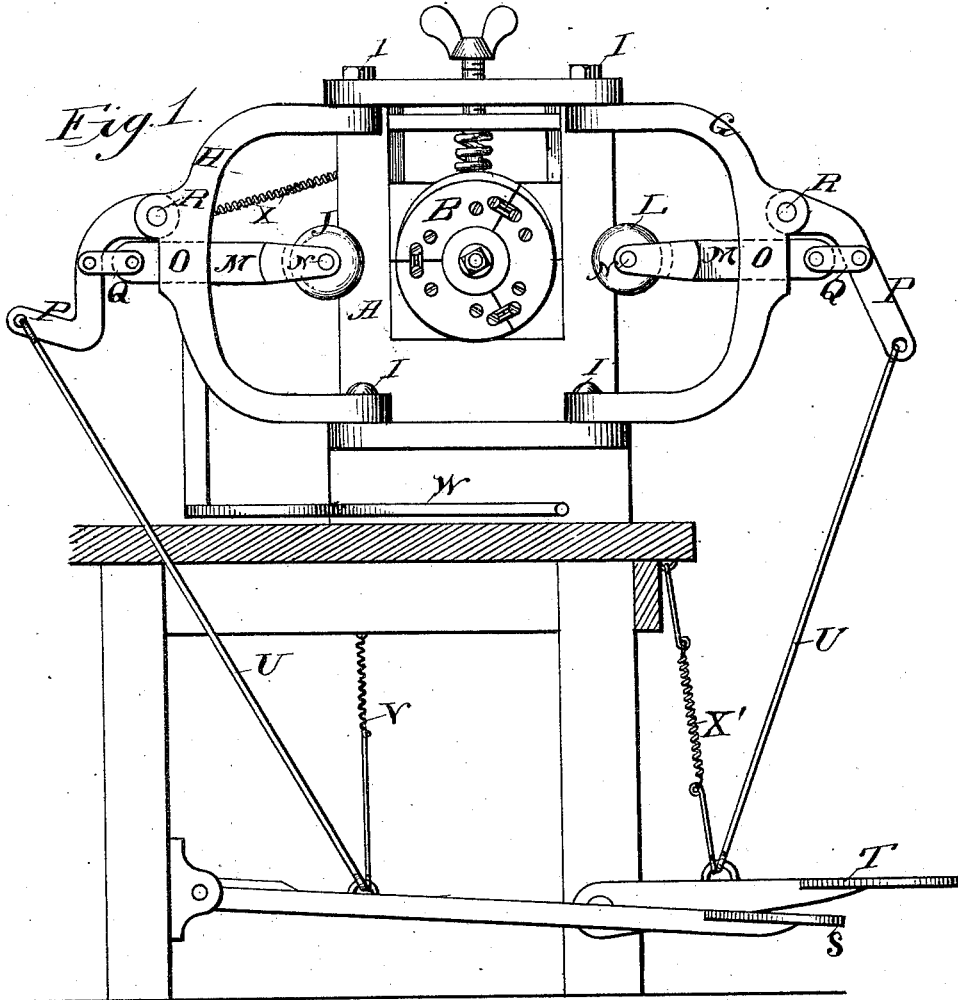
(No Model.)

2 Sheets—Sheet 1.

A. J. LINDEMANN.  
Machine for Making Stove Pipe Elbows.

No. 232,045.

Patented Sept. 7, 1880.



WITNESSES  
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 ATTORNEY

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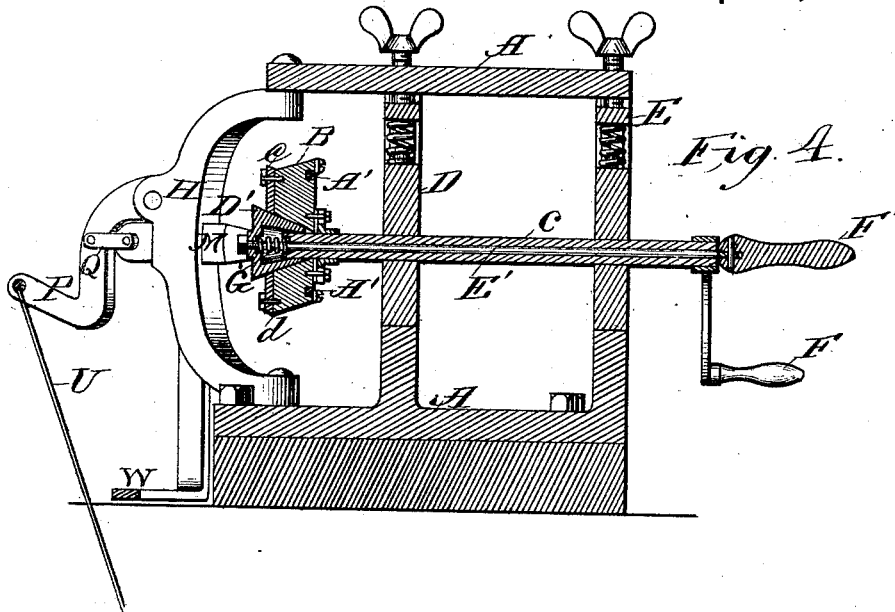


Fig. 5.

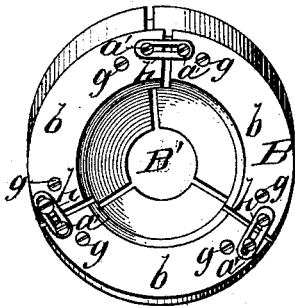


Fig. 6.

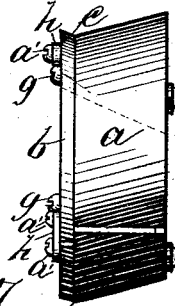
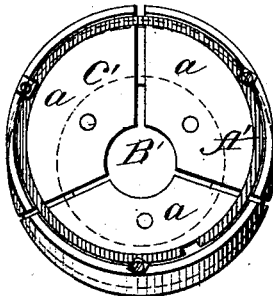


Fig. 7.



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# UNITED STATES PATENT OFFICE.

ALBERT J. LINDEMANN, OF MILWAUKEE, WISCONSIN.

## MACHINE FOR MAKING STOVE-PIPE ELBOWS.

SPECIFICATION forming part of Letters Patent No. 232,045, dated September 7, 1880.

Application filed May 17, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT J. LINDEMANN, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Machines for Manufacturing Stove-Pipe Elbows; 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for making stove-pipe elbows.

The object of my invention is to provide a device for rigidly holding the sections of an elbow in contact at the required angles while shaping their edges and interlocking and compressing them in the process of forming a double-lock joint or seam.

A further object of the device is to revolve the elbow or the sections thus held in contact in such a manner that the seam or points of contact of the sections will describe a circle or revolve in a circular line, whereby the seaming or beading rollers may be applied in turning the edges and compressing the seam with uniform pressure while the elbow is being rapidly revolved.

A further object of my invention is to provide a tool-rest or device for holding the beading-rollers at the required angles and in the true and exact relative position for turning down, interlocking, and compressing the edges of the sections in forming a double seam, and for applying the power required in shaping the metal.

My invention is further explained by reference to the accompanying drawings, in which Figure 1 represents a front view. Fig. 2 represents a front view of the beading-roller shown upon the left in Fig. 1. Fig. 3 represents a front view of the beading-roller shown upon the right in Fig. 1. Fig. 4 represents a longitudinal vertical section. Fig. 5 represents a perspective of the chuck detached. Fig. 6 represents a side view of the chuck detached. Fig. 7 represents a rear view of the chuck detached. Fig. 8 is a sectional view of the beading-roller shown in Fig. 2. Fig. 9 is

a sectional view of the beading-roller shown in Fig. 3.

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

A is the frame of the machine, which is constructed in a substantial manner. B is an angular chuck. It is supported upon and revolved with shaft C, which shaft has its bearings in standards D and E, respectively. F is a crank for revolving the shaft. G and H are supporting-brackets for holding and applying the beading-rollers. The upper and lower arms of the brackets G and H are respectively hinged to the frame A by bolts I I I I. J is the beading-roller shown upon the left in Fig. 1, the periphery of which is provided with an angular groove, K, formed in the peculiar shape shown in cross-section in Fig. 8. L is the beading-roller shown upon the right in Fig. 1, the periphery of which is oval in shape, as shown in cross-section in Fig. 9.

The beading-rollers J and L are respectively supported by the slotted reciprocating arms or bars M M, to which they are respectively attached by pins or bolts N N, upon which they loosely revolve.

The arms M M, respectively, pass through openings O O in the respective brackets, through which openings they have a free horizontal movement. The outward ends of the arms M are respectively connected to levers P P by links Q Q.

The short arms of the levers P are respectively hinged to the brackets G and H by pins R R. The long arms of the levers P are respectively connected with the respective treadles S and T by rods U U.

When pressure is put upon the respective treadles the beading-rollers J and L are acted upon through the connecting medium described and pressed against the chuck B.

When the pressure is removed from the treadles they are respectively drawn upward by the spiral springs, and the beading-pulleys are thrown back from the chuck.

When the sections forming the elbow are connected together and secured upon the chuck the roller J is first applied, it being brought in contact therewith by downward pressure of the foot upon treadle S. The edges of the sections first enter the slot K when the arm M is swung forward with the bracket

H, which turns upon hinges I I, whereby the edges of the sections thus held are gradually bent forward and downward as the sections are revolved. The bracket and arm are thus swung forward and operated by means of arm or lever W, which is connected therewith. Thus while the chuck is revolved the beading-roller is pressed against the sections by pressure upon the treadle, and the proper inclination is given to the beading-roller, and the direction of its pressure governed by the swinging bracket, and all are operated simultaneously until the respective edges of the sections are interlocked together. This done, the foot of the operator is raised from treadle S and placed upon treadle T with great force simultaneously with revolving the chuck, when the roller L is thereby pressed against the seam until it is firmly and smoothly compressed together.

X is a spiral spring which draws back the swinging bracket H as soon as the treadle S is released.

The chuck B is formed in triangular sections *a a a*, the peripheries of which are arranged upon an angle to the shaft C and sections *b b b*, the peripheries of which are arranged upon an angle to the shaft C. The peripheries of the respective sections *a a a* and *b b b* unite to form an obtuse angle, *c d*, which conforms in shape to the angles in the stove-pipe elbow. The sections *a* and *b* are secured rigidly together by screws *g g g*. The triangular sections *a* and *b* being thus respectively secured together, the sections thus united are connected together as a single circular body by slotted links *h h h*, which links are respectively attached to the sections with screws *a'*, as shown. The screws *a'* are loosely fitted in the slots, and permit the chuck to be expanded and contracted.

The office of the slotted links *h h h* is to retain the triangular sections in their proper relative position to each other around the shaft C, and prevent them from being pressed outward or separated too far from each other by the action of the conical-shaped block.

A' is a circular spring-band, which, by its contracting force, draws the several sections toward a common center around the shaft C, and thus holds them in close contact. The chuck thus formed has a conical-shaped opening, B', extending through from its front to its rear side, the base or largest diameter of the opening being in front and tapering uniformly toward the center. The opening B' is shown from the front side of the chuck in Fig. 5, and from its rear side in Fig. 7.

The dotted line C' in Fig. 7 represents the line described by the opening upon its front side. The opening B' is provided with a conical-shaped block, D', which conforms to the shape of the opening. When the sections *a a a* and *b b b* are in contact the opening B' is smaller or of less diameter than the block D', permitting the small end of the block only to enter without separating the sections.

The block D' is loosely fitted upon the end of the hollow shaft C, so that it has a free lateral movement upon it within the opening B'. The block D' is connected with eccentric lever F' by rod E', which extends through the hollow shaft C.

The lever F' bears against the end of the shaft C, and as it is inclined at right angles to the shaft it draws the block D backward within the opening B' with great force, whereby the several sections are separated and moved outward, thus increasing the diameter of the chuck. When the lever F' is brought again on line with the shaft C in the position shown the block D' is thrown forward out of the opening B' by the spiral spring G', which surrounds the rod E', and is compressed between the end of shaft C and front wall of block D'. When the block D' is thus thrown forward the spring-band A' draws the sections together again, thus diminishing the diameter of the chuck. When the chuck is thus contracted the sections of the elbow to be seamed are connected loosely together and placed upon it in such a position that their concave sides are brought above the angle *c* of the chuck and the convex side of the elbow is brought below the angle *d*.

When the chuck is expanded by moving the lever F', as described, and the sections are interlocked and held firmly and rigidly upon the chuck in their proper relative position to each other, so that the great pressure required in turning, locking, and compressing their edges may be applied without moving the sections upon the chuck. When the sections are thus locked upon the chuck the chuck is revolved and the beading-rollers applied, until the seam is completed, when the chuck is contracted and the sections removed.

The angles *c* and *d* may be changed according to the pitch of the angles of the elbow to be made. For a four-pieced elbow the angles are more acute. For a six-pieced elbow the angles are less acute.

The object of the angles *c* and *d* is to give the sections the required pitch and retain them at the required angles while the seams are being formed. Thus, when all the sections composing a given elbow have been seamed together upon the chuck their angles will invariably be uniform in shape, and the elbows as a whole will be neat and symmetrical in appearance.

Having thus described my invention, I do not confine myself to the peculiar construction of the supporting-frame A, as the chuck may be operated upon a common mandrel or turning-lathe, and the shaft C may be revolved with a band-pulley instead of crank F. Neither do I confine myself to the number of triangular sections composing the chuck, as it is obvious that four or six or a less or greater number will serve the purpose equally well.

It is also obvious that the eccentric lever F' may be substituted by a common screw and

hand nut or other equivalent device for drawing back the rod E'. I prefer the eccentric lever, however, as it is more quickly operated.

What I claim as new, and desire to secure by Letters Patent, is—

1. In machines for manufacturing stove-pipe elbows, a chuck constructed in triangular sections secured together by slotted links adapted to retain the sections in the proper relative position around the central shaft and limit and check their expansion at a fixed uniform distance from their common center, and a metallic spring-band adapted to contract the sections toward their common center, whereby the chuck is adapted to be expanded and contracted, substantially as set forth.

2. The combination of expanding chuck B, constructed in sections connected together with slotted links *h* and spring-band A', and provided with conical opening B', the conical wedge D', with hollow shaft C, rod E', the rod being adapted to draw the conical wedge into the opening B', spring G', as adapted to force back the conical block from the opening-crank F, and eccentric lever F', substantially as and for the purpose specified.

3. In machines for manufacturing stove-pipe

elbows, the swing-brackets or tool-rests G and H, adapted to supporting and applying the beading-rollers at the required angles for turning and compressing a seam, arms M M, provided with beading-rollers J and L, and levers P P, for applying the required pressure of the beading-rollers to the seam, said arms M being supported by said brackets in recesses O and connected with the levers P by links Q, all substantially as and for the purpose set forth.

4. The combination of bracket H, lever P, link Q, arm M, beading-roller J, provided with groove K, lever W, frame A, rod U, treadle S, and spiral spring V, all substantially as and for the purpose set forth.

5. The combination of bracket G, lever P, link Q, arm M, beading-roller L, having oval periphery, frame A, rod U, treadle T, and spiral spring X, all substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT J. LINDEMANN.

Witnesses:

JAS. B. ERWIN,

W. J. SINNOTT.