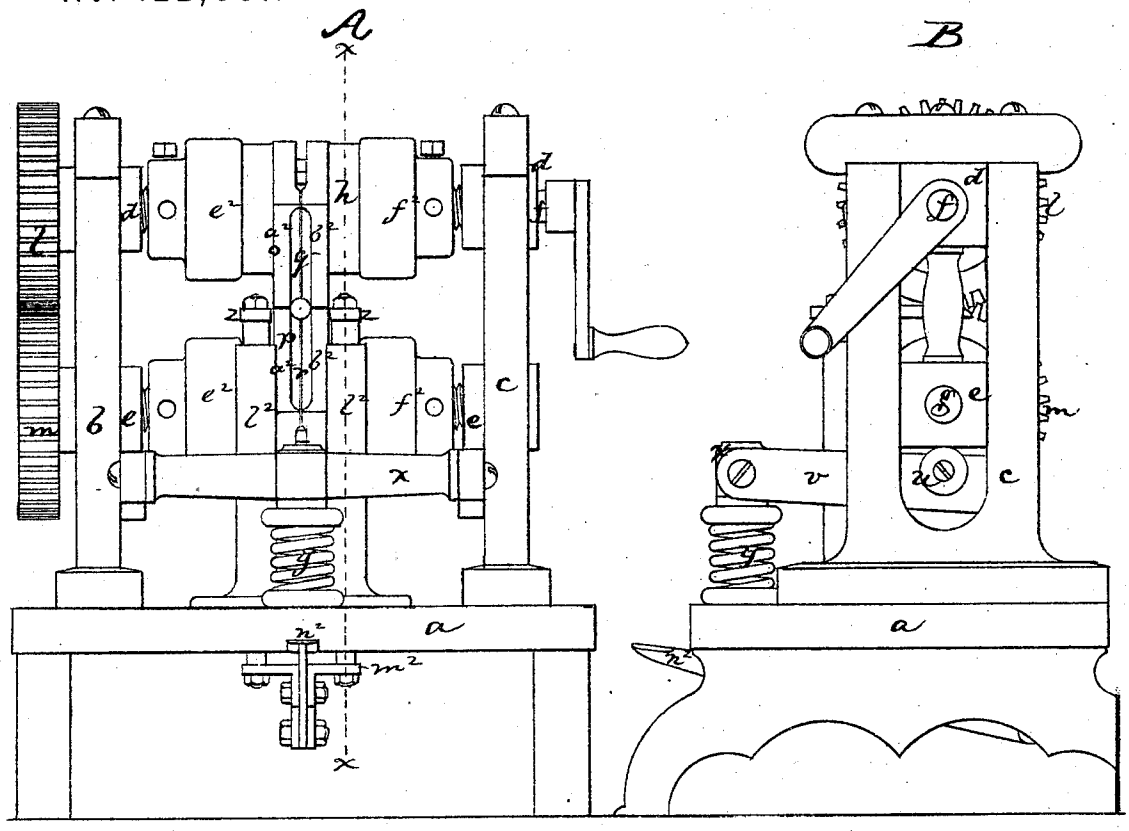
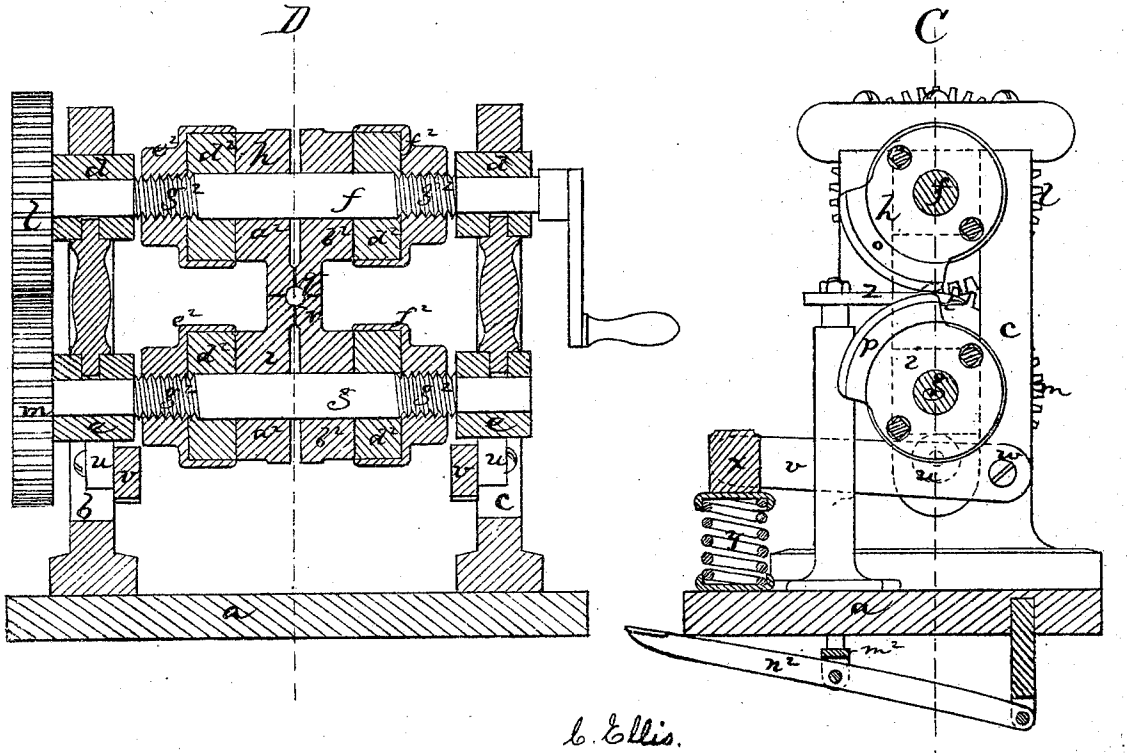
(141.) 2 Sheets--Sheet 1.

C. ELLIS & O. AMES, 2d.

Improvement in the Manufacture of Shovels.

No. 122,881. Patented Jan. 23, 1872.





Witnesses.
M. M. Brotherhood.
L. H. Bostwick.

C. Ellis.
O. Ames 2d.
By their Attys.
Crosby & Gould

(141.)

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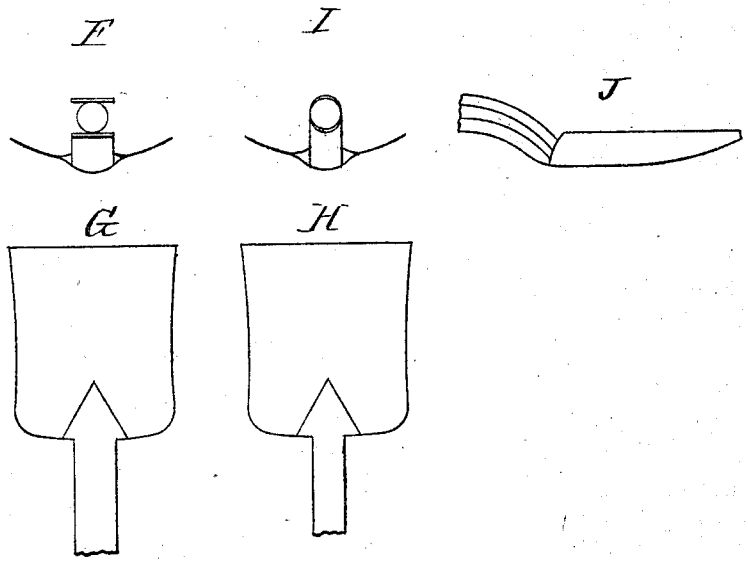

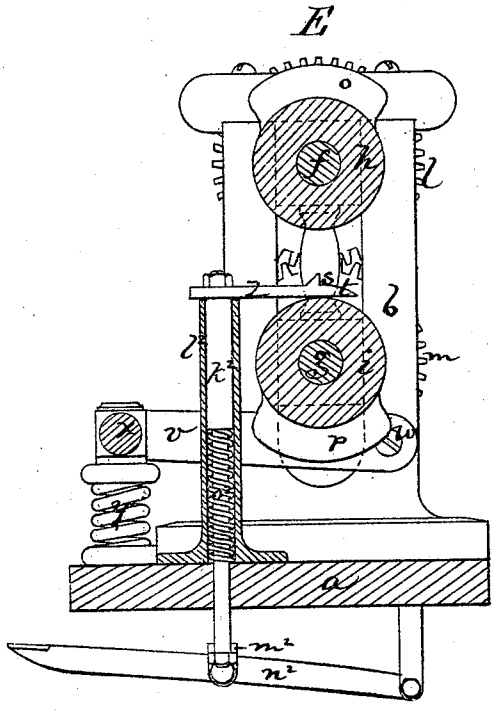

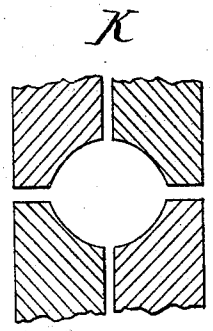

C. Ellis.
O. Ames 2d.
By their Attys.
Crosby & Gould.

Witnesses.
M. W. Frothingham.
L. N. Latimer.

UNITED STATES PATENT OFFICE.

CHARLES ELLIS, OF CANTON, AND OLIVER AMES, 2D, OF NORTH EASTON, MASSACHUSETTS.

IMPROVEMENT IN THE MANUFACTURE OF SHOVELS.

Specification forming part of Letters Patent No. 122,881, dated January 23, 1872.

To all whom it may concern:

Be it known that we, CHARLES ELLIS, of Canton, Norfolk county, and OLIVER AMES, 2d, of North Easton, Bristol county, all in the State of Massachusetts, have invented an Improved Machine for Rolling the Edges of Straps into Shovel-Handles; and we do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

Our invention relates to a method of rolling or pressing shovel-straps upon the handles of shovels in such manner that the edges of the straps are driven into or embedded in the wood, leaving no projecting edges or shoulders at the sides of the straps.

Prior to our invention shovel-straps have been pressed down to the surfaces of the handles to which they were riveted by rolls, and the edges have then been driven into the wood with hand-hammers, the work being always imperfectly done, and being a lengthy, laborious, and expensive operation.

In our invention we press the strap into the wood (at its edges) by means of a pair of die-rolls or rolls having peripheral grooves, the surfaces of which grooves, biting upon the straps properly presented for their grasp, are so formed as to feed the handles and straps between them as they rotate, and to press each strap at its edges into the handle, and embed it at its edges; our invention consisting in the general organization of mechanism by which this is effected and in some of the details of construction and arrangement of such mechanism.

The drawing represents a machine embodying our organization of mechanism. A shows the machine in front elevation. B is an end elevation thereof. C is a vertical cross-section on the line *x x*. D is a vertical central section, showing the shafts and gears in elevation. E is a sectional elevation, showing the position of the parts ready for reception of the handle. F and G show the form and position of the straps prior to rolling them down. H, I, and J show the handle with the straps rolled down against it and embedded at their edges into it. K is a section of the rolls at the die-grooves, said section being enlarged from the other views.

a denotes a suitable bed-plate upon which two housing-stands, *b c*, are supported, these housings carrying boxes *d d e e*, in which are journaled the shafts *f g* of two rolls, *h i*, the shafts *f g* being connected to gears *l m*. Each roll has on one side a segmental projection, *o* or *p*, in the periphery of which is a groove, *q* or *r*, and as the rolls rotate the ends of these grooves first come together and match, as seen at A, the two grooves keeping together or moving at the same speed. The form of the grooves at their initial ends corresponds to the form in section of the handle and straps at the blade when the straps are bent to the surface of the handle and embedded therein at their edges, and every section of the grooves, where they meet, in rotation similarly corresponds to the section of the handle and handle-embedded straps at the same point, so that if the blade is so presented that the shoulders on the rolls strike its edge (the straps being in the plane of the roller-grooves) the dies as they rotate will pass upon the straps and force them into the handle at their edges. For a rest for the blade in presenting it, and to bring the straps into proper position for the action of the roller-grooves, we employ guide-bars *z z*, one on each side of the lower segment, each guide-bar having a gauge or shoulder, *s*, the blade being laid upon the rear ends *t* of the bars, (the ends of the blade on each side of the strap against the adjacent shoulder *s*,) the handle extending through between the rolls and being held by the operator. As the bending-rolls strike the flat straps—the position of which with respect to the handle is shown at F—they bend the flat metal down to and snugly against the handle, and when the rolls *h i* pass upon the straps they press the metal at each edge into the handle, so that the surface of each strap at each edge and the adjacent surface of the handle are flush; and if the handles and straps are of uniform size and the metal for straps of uniform thickness solid rolls may be employed with shafts rotating in stationary bearings or with no yield of one groove relatively to the other, or of one part or half of either groove relatively to the other part or half, which construction would embrace our invention in its simplest form. The straps and handles do generally differ, and so does the thickness of the strap metal, and for this reason we prefer to

employ sectional rolls the sections of which are held together by strong springs; and we also prefer to employ a yielding-roll, held against or toward the other roll by a strong spring, the stress of the section springs and the stress of the lower roll-springs being such as to permit yield only when opposed by the solid thickness of wood and iron, the stress of the springs being sufficient to cause the respective rolls and the respective parts of each roll to perform their work, forcing or embedding the straps into the wood. The provisions for yielding are as follows: The boxes of the upper roll are stationary, but those of the lower roll slide in their housings and are supported on rolls u at the sides of a lever-frame, v, fulcrumed or pivoted at w, and having under its front cross or connecting bar x a stout spring, y, which spring yields and enables the roll to yield (as and only as compelled to do so) by the entrance into the roller-grooves of the solid strap and wood after the strap has been bent to and driven into the wood. Each roll is made in two parts or sections, a^2 b^2, splined to the shaft, as seen at c^2, so as to be capable of end-movement upon the shaft, but rotating with it, half of the groove of each roll being in one part, a^2, and the other half in the other part b^2, as seen at A and C. At the outer end of each part or section a^2 b^2 is a spring, d^2, which is preferably a solid caoutchouc ring, and the two springs of each shaft are held up against the respective sections a^2 b^2, and hold the sections normally together by flanged collars e^2 f^2, the flanges of which encompass the springs, the stress of the springs against the roller sections being increased by turning the collars up or back, each collar being nut-threaded and turning in a corresponding screw-thread, g^2, formed on the shaft, and each having a nut-threaded gib, h^2, which, by means of a set-screw, i^2, is forced against the screw to fix the collar upon the shaft. The stress of the springs is always sufficient to force the straps into the wood, but enables the parts a^2 b^2 to yield if strap metal exceeds a normal thickness or the handle is of a diameter exceeding a normal diameter. To permit the guide-bars z z to drop for the free passage of the shovel-blade through the rolls, to bring it to position on the guides for the action of the rolls, each guide-bar is fastened upon the top of a rod, k^2, extending down through a vertical tubular stand, l^2, the two rods being connected at their lower ends by a connecting-bar, m^2, to which a treadle-lever, n^2, is jointed, pressure of the foot of the operator upon the front of the treadle-lever depressing the guides, and they being thrown up by the stress of a suitable spring, o^2, when the treadle is released.

The straps might be pressed into or embedded in the handle one at a time by one roll, but the two rolls simultaneously operating upon both straps are obviously preferable. And the devices for permitting yield of the rolls and the roll sections, and for bringing the guides into position and enabling them to be depressed for the entrance of the shovel-blade, may, of course, be more or less varied. We have found, however, that the specific construction shown is well adapted for its purpose.

We claim—

1. The improvement in the art of applying shovel-straps to handles, consisting in embedding the edges of the straps in the wood by rolling, substantially as described.

2. The strap-bending and embedding-rolls h i, each divided through the center of the groove into the two parts a^2 b^2, held together normally by suitable springs, substantially as shown and described.

3. In combination with each roller, the annular spring d^2 and flanged spring-encompassing and spring-holding collars e^2 f^2, substantially as shown and described.

4. In combination with the guide-bars, the rods k^2, vertical stands l^2, raised by springs and the treadle-lever n^2, substantially as described.

5. In combination with the roll i, the sliding boxes e, lever-frame v, and spring y, substantially as described.

CHARLES ELLIS.
OLIVER AMES, 2D.

Witnesses:
F. M. AMES,
EDW. R. EAGER,
GEO. W. KENNEDY,
E. GILMORE.