

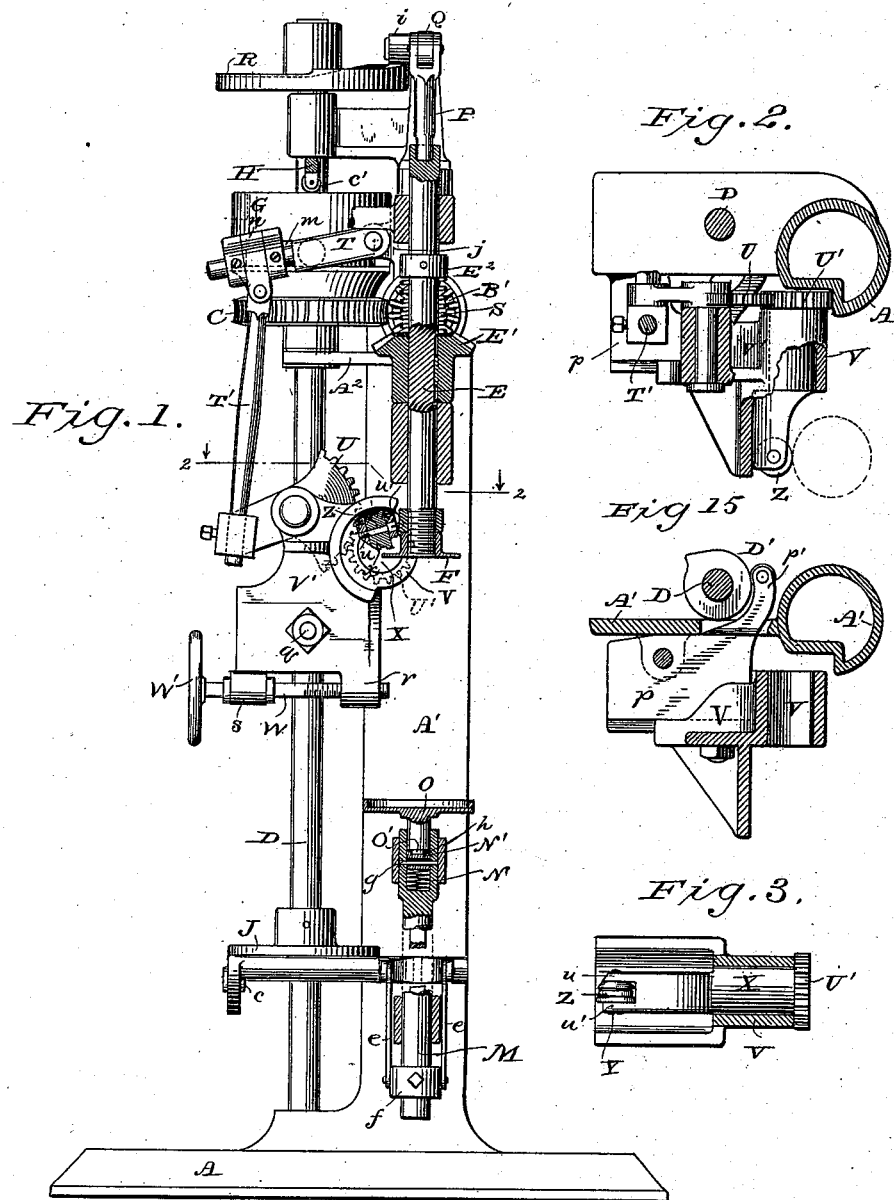
(No Model.)

3 Sheets—Sheet 1.

F. A. WALSH.
SEAMING MACHINE.

No. 382,572.

Patented May 8, 1888.



Witnesses.

Geo. W. Young.
J. E. Oliphant

Inventor.

Francis A. Walsh.

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Attorneys.

(No Model.)

3 Sheets—Sheet 2.

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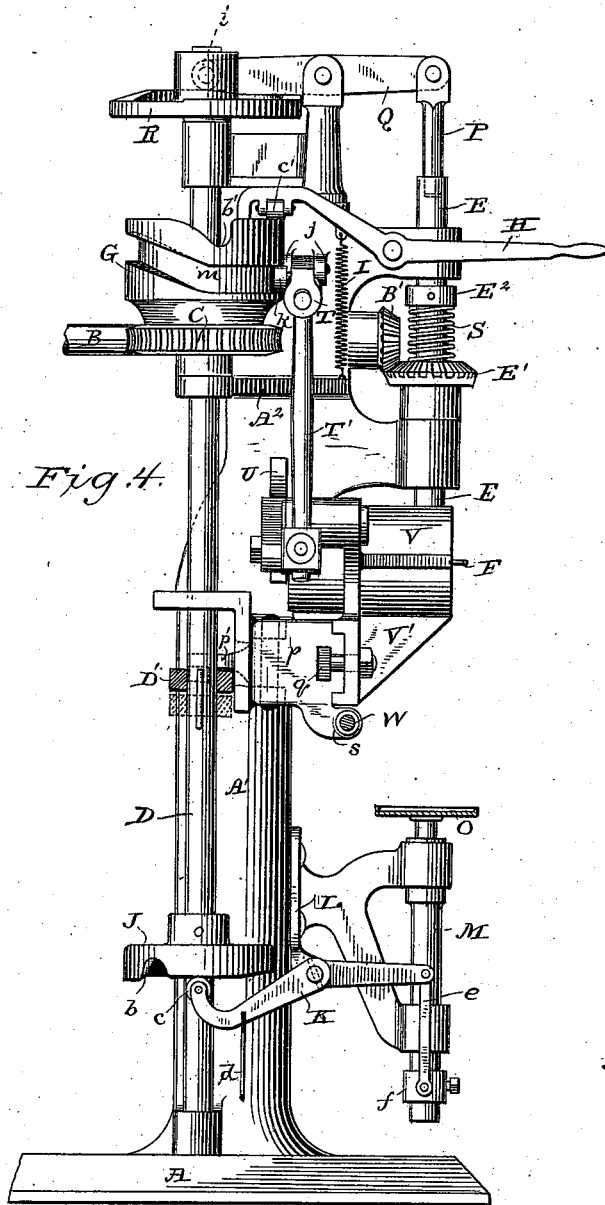


Fig. 5.

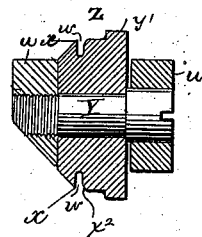


Fig. 6.

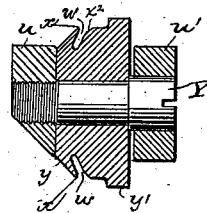
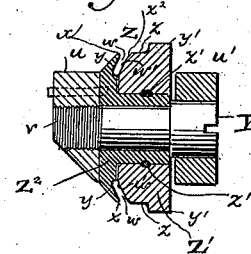


Fig. 7.



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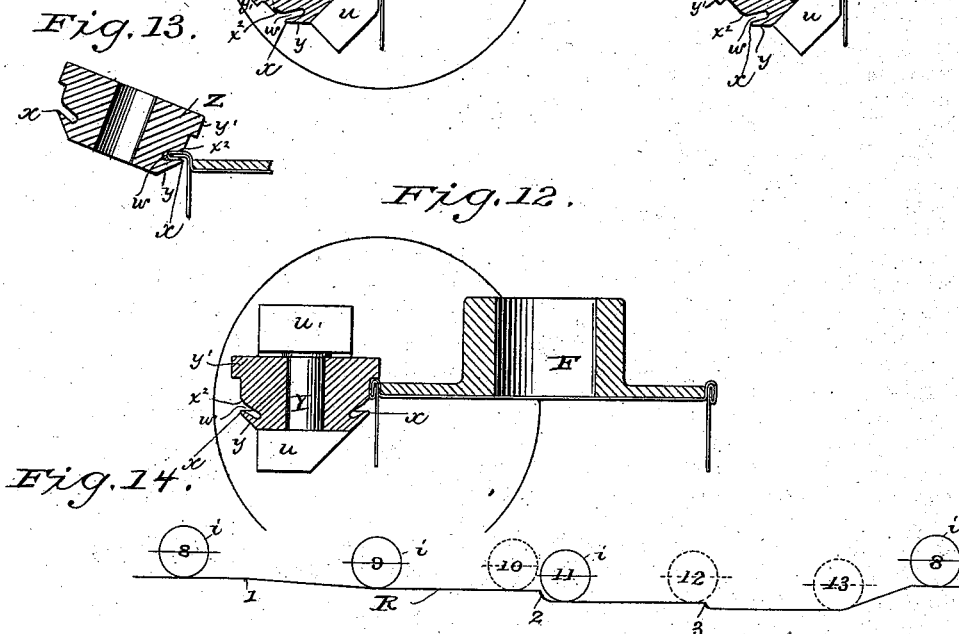
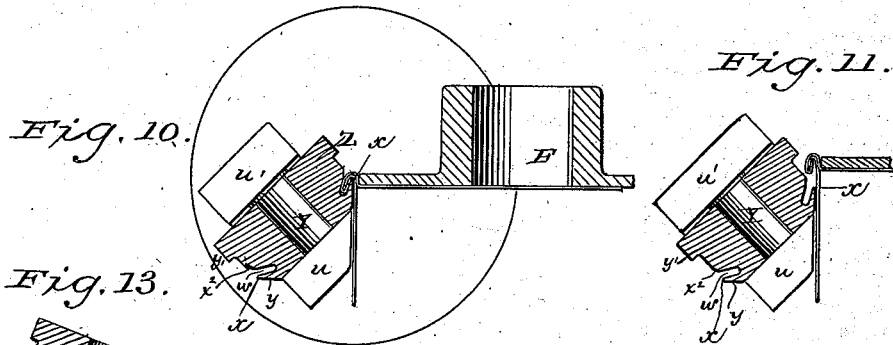
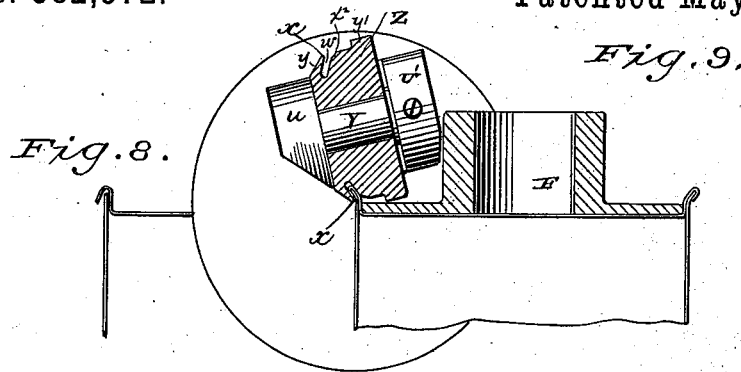
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UNITED STATES PATENT OFFICE.

FRANCIS A. WALSH, OF MILWAUKEE, WISCONSIN.

SEAMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 382,572, dated May 8, 1888.

Application filed September 3, 1887. Serial No. 248,673. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. WALSH, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Seaming-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to machines for seaming sheet-metal vessels; and it consists in certain peculiarities of construction and combination of parts, to be hereinafter described with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a front elevation, partly in section, of a machine embodying my improvements; Fig. 2, a horizontal section on line 2 2, Fig. 1; Fig. 3, a detail sectional view showing the seaming-roll or former and the bearing for the shaft that carries said roll or former; Fig. 4, a side elevation of the machine; Figs. 5, 6, and 7, detail views of the seaming-roll or former; Figs. 8, 9, 10, 11, 12, and 13, diagram views showing the operation of the seaming-roll or former; Fig. 14, a profile view of a cam that forms part of the machine, and Fig. 15 a modification.

Referring by letter to the drawings, A represents the base, and A' the standard, of a seaming-machine. The standard is provided with bearings for a drive-shaft, B, that is geared to a worm-wheel, C, loose on a vertical shaft, D, that has its bearings in arms of said standard. The drive-shaft B is provided with a pinion, B', arranged to mesh with a gear-wheel, E', feathered on a vertical spindle, E, that has its bearings in an arm of the standard A', and to the lower end of this spindle I adjustably secure a chuck, F, in order to accommodate the machine to any slight differences in depth that may occur in stamping the countersink in the ends or covers of sheet-metal vessels.

Fast on the vertical shaft D is a cam-wheel, G, interiorly provided with a clutch mechanism (not shown) similar to that described and illustrated in my patent, No. 321,263, dated June 30, 1885, and in my application, Serial No. 223,200, filed January 3, 1887. By a downward movement of the lever H, fulcrumed to an arm of the standard A', the clutch mechanism is operated to unite the cam-wheel G with the worm-wheel C, and this lever is returned

to its normal position by a spring, I, connecting it with a shelf, A², on said standard.

The lower portion of the vertical shaft D carries a cam-wheel, J, that is provided with a notch, b, to engage a roulette, c, on the inner end of a lever, K, the latter being fulcrumed to a bracket, L, that is suitably secured to the main standard of the machine. The cam-wheel G is also provided with a notch, b', to engage a roulette, c', on the starting-lever H. A rod, d, is designed to connect the lever K with a treadle, (not shown,) and the bifurcated outer end of said lever is connected by links e to a collar, f, suitably secured to a spindle, M, the latter having its bearings in arms of the bracket L in line with the spindle E. The upper end of the spindle M is bored out to receive a spring, N, that is held in a compressed position by means of a slotted block, N', arranged on a pin, g, passed through it and the spindle.

The upper face of the block N' is provided with a seat, h, for the reduced end of a stem, O', on a chuck, Q.

The live-spindle E has its upper end bored out to receive the lower end of a stem, P, that is pivotally connected to a lever, Q, fulcrumed to an arm of the standard A', and provided at its free end with a roulette, i, the latter being arranged to impinge upon a cam-wheel, R, on the upper portion of the vertical shaft D. A spiral spring, S, arranged on the spindle E between the gear-wheel E' and a collar, E², serves to support said spindle and keep it up against the stem P.

Fulcrumed to lugs j on the standard A' is a lever-arm, T, that carries a roulette, k, arranged to travel in the cam-groove m of the wheel G, and adjustably secured to the free end of this lever is a shackle, n, to which is pivoted the upper extremity of rod T'. The lower extremity of the rod T' is adjustably connected to a toothed segment, U, journaled to the lateral and vertically-depending flange V' of a bearing, V, the latter being secured to a suitably-grooved block, p, on the standard A' by means of a bolt, q.

Depending from the flange V' of the bearing V is a lug, r, that engages the inner end of an adjusting-screw, W, that has its bearing in a lug, s, on the block p, and is provided with a hand-wheel, W'.

The toothed segment U meshes with a pinion, U', on the inner end of a shaft, X, arranged in the bearing V, and the forward portion of this shaft is reduced, so that its outer end will come one side of the center, as best illustrated by Fig. 2. The outer end of the shaft X is bifurcated, and the bifurcations *u u'* provided with openings. The opening in the bifurcation *u* is screw-threaded to engage the correspondingly-formed end *v* of a stud or support, Y, that passes through the other bifurcation, *u'*, and loosely arranged on this stud or support is a seaming-roll or former, Z. The seaming-roll or former has an annular groove, *w*, that in my invention is at an acute angle to the axis of said roll or former; but in my machine it is possible to employ a roll or former similar to the one shown by Fig. 5, wherein the groove is at a right angle to said axis. From the groove *w* toward the bifurcation *u* of shaft X the periphery of the seaming-roll or former Z is beveled, as shown at *y*, while in the opposite direction it is plain, as shown at *z*; or it may be grooved, and the edge *x* of the beveled portion *y* of said roll or former is always in line with the axis of the shaft Z. I have illustrated said roll or former as provided with an annular shoulder, *y'*; but the latter is not absolutely essential, and may be omitted at pleasure.

In Fig. 7 I show the seaming-roll or former Z as made in sections, held together by means of keys *z'*, and this construction may be found preferable, for the reason that I can more readily compensate for wear in the groove *w*.

In either the solid or sectional roll or former there is wear on the face adjacent to the bifurcation *u'* of the shaft X, and this wear is compensated for by screwing up the stud or support Y; but in said solid roll there is no ready means for taking up the wear in the groove.

To take up the wear in the groove of the sectional roll or former, the pins *z'* are withdrawn to disunite the sections, and the inner face of the section Z' or working side *w'* of said groove is faced or lapped and the parts again united. As shown by dotted lines, Fig. 7, the section Z' of the roll or former Z may be held by means of a pin; or in place of this circular section I may employ a blade or point having its inner face of suitable contour, and in either case the section Z' of said roll or former may be free to revolve.

In the operation of my machine I will describe the same as working a double seam on a straight-sided vessel, (such as shown in my patent, No. 272,500, of February 20, 1883;) but it can be as readily employed for single-seaming this style of vessel; or the machine may be adjusted to double seam vessels that have a laterally-projecting flange, as in the old and well-known method of forming double seams described in Patent No. 228,234, issued to me June 1, 1880.

The vessel shown by Fig. 8 as ready to be seamed is placed on the lower chuck and the latter elevated by a movement of the lever K

to bring said vessel against the chuck F on the live-spindle E. The vessel being chucked, and consequently in revolution, the starting-lever H is drawn down to set the seaming mechanism in motion, and it is obvious that both the chucking and starting can be done by a movement of said lever.

For the operation of seaming, both the cams J R are timed alike to cause a vertical movement of the vessel; but on the completion of a seam the time of said cams varies, for the purpose to be hereinafter described.

The distance from 8 to 1 on the cam R, as shown by the profile view Fig. 13, is equal to the time occupied in automatically chucking the vessel by actuating the starting-lever. From 1 to 9 the travel of the cam J causes the lever K to lift and force the vessel upward to bring the flange of the cover-piece and edge of said vessel into the groove *w* of the seaming-roll or former Z, the roll or former being preferably beveled on one side of said groove to widen the latter at its mouth, so as to insure the engagement just described, as well as to form a finishing-face, *x'*, for the purpose to be hereinafter set forth, and should vessels have a slight variance in length the spring and loose block mechanism N N' will compensate for such variation. The vessel and seaming-roll or former are now in the position shown by the diagram Fig. 9. By the time the cams J R have traveled from 1 to 9 the cam G begins to actuate the lever-arm T, that in turn actuates the toothed segment U in mesh with the pinion U' on the shaft X, and the latter is rocked to turn over the single seam and bring the seaming-roll or former to the position shown by the diagram Fig. 10, while said cams J R are traveling the distance from 9 to 10. Instead of rocking the roll or former the distance required to perform the operation just described, the mechanism may be so arranged by adjusting the shackle *n* as to stop the rocking motion midway between the positions shown by Figs. 9 and 10, and then withdraw said roll or former to clear the seam as it rocks back, said seam being then finished for some purposes at right angles to the vessel, as shown by Fig. 13. At the point marked 2 the cams J R drop and the vessel is automatically elevated away from the seaming-roll or former, as shown by the diagram Fig. 11. The cam G is so timed that while the cams J R are traveling the distance from 11 to 12 the seaming-roll or former will be rocked back and held in the position shown by diagram Fig. 12, to close the seam down close against the vessel; or the roll or former may be so timed as to finish on the beveled portion *x'* of the groove as the seam goes out of said groove.

At the point marked 3 the upper cam, R, has a drop that permits the chuck F to rise, and the shoulder *y'* on the seaming-roll or former serves to hold the vessel down on the lower chuck, O, the latter being stationary in a vertical direction during this operation on account of the cam J being horizontal and un-

interrupted from 11 to 13. The cam G is so timed that when the vessel has been unchucked the seaming-roll or former continues to rock back to its original position, and by the time the cams J R have traveled from 13 to 8 the roulettes *c c'* will have dropped into the notches *bb'* to stop the machine and lower the chuck O, so that the finished vessel may be withdrawn.

While I have shown the seaming-roll or former as stationary in a vertical direction and a mechanism for bringing the vessel to and from said roll or former, it is obvious that a machine may be organized wherein the vessel would remain in one position and the roll or former moved to or from the seam at predetermined intervals.

Some mechanism is necessary to withdraw the roll or former from the seam upon its completion at right angles to the vessel, as described with reference to Fig. 13; and, as best illustrated in Fig. 15, I show the block *p* (to which the bearing V is adjustably secured) as pivoted to the standard A' and provided with an arm, *p'*, that extends through a slot in said standard and carries a roulette arranged to come against a cam, D', on the vertical shaft D, this cam being so timed as to swing said bearing in a lateral direction at predetermined intervals. The mechanism just described is also employed when the machine is organized to seam vessels having a laterally-projecting flange, as in the old style of double seaming described in Patent No. 228,234, above mentioned, it being necessary that the roll or former shall have a lateral movement to bring it to and from the seam at predetermined intervals.

The roll or former Z may be made of the right diameter to suit the stock to be worked upon, or, in other words, to have the right amount of space between it and the chuck F for the folds of the stock; or said roll or former may be of less diameter than would simply afford such space and have a motion toward the seam that would compress the latter firmly against the chuck. This latter operation can be accomplished by the mechanism best illustrated in Fig. 15, the cam D' being properly timed.

When the machine is to be used for seaming both ends to the vessel-body at one operation, the seaming mechanism is duplicated and operated to either follow said vessel or simultaneously come on and off the seams. Should the vessels be other than circular in cross-section, the parts carrying the seaming-roll or former would be arranged to have a lateral motion to correspond with the irregular shape of said vessels, this motion being imparted by a pattern-cam (not shown) on the shaft D.

I am aware of a machine in which a single roll (either solid or sectional) has been employed for seaming on the tops and bottoms of sheet-metal vessels, said roller being provided with a series of variously-shaped grooves and pivoted to a lever that is journaled in bearings, one of these bearings having loose play, in order that the roll may be raised or lowered

by hand at different times during the process of seaming to bring a different groove into operation, and such I do not claim.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for seaming sheet-metal vessels, a roll or former having a seaming-groove at an acute angle to its axis, and means, substantially as described, for actuating said roll or former with relation to a vessel, whereby the operation of seaming is accomplished, as set forth.

2. In a machine for seaming sheet-metal vessels, a roll or former having a seaming-groove at an acute angle to its axis and a finishing-face approximately parallel to said axis, and means, substantially as described, for actuating said roll or former with relation to a vessel, whereby the operation of double-seaming may be accomplished, as set forth.

3. In a machine for seaming sheet-metal vessels, a roll or former having a seaming-groove at an acute angle to its axis, a finishing-face approximately parallel to said axis, and a shoulder at an angle to the finishing-face, and means, substantially as described, for actuating said roll or former with relation to a vessel, whereby the operation of seaming is accomplished, as set forth.

4. In a machine for seaming sheet-metal vessels, a roll or former made in two sections, said sections so constructed and arranged that a groove at an acute angle to the axis of the roll or former is left between the opposing surfaces of said sections, and means, substantially as described, for actuating said roll or former with relation to a vessel, whereby the operation of seaming may be accomplished, as set forth.

5. In a machine for seaming sheet-metal vessels, a roll or former made in two sections, so constructed and arranged that a groove at an acute angle to the axis of the roll or former is left between the opposing surfaces of the sections, and means, substantially as described, for holding one of said sections against rotation and for actuating said roll or former with relation to a vessel, whereby the operation of seaming is accomplished, as set forth.

6. In a machine for seaming sheet-metal vessels, a roll or former provided with a seaming-groove and beveled on one side of this groove to form a finishing-face, and means, substantially as described, for actuating said roll or former, whereby the operation of seaming is accomplished, as set forth.

7. In a machine for seaming sheet-metal vessels, a bifurcated rock-shaft, a stud or support adjustable in the bifurcation of the shaft, a seaming-roll or former arranged on said stud or support, and means, substantially as described, for actuating said shaft with relation to a vessel, whereby the operation of seaming may be accomplished, as set forth.

8. In a machine for seaming sheet-metal vessels, the combination of a chucking mech-

anism, a shaft, a roll or former carried by the shaft, and mechanism, substantially as described, connecting the shaft and chucking mechanism, whereby the shaft is rocked and the chucking mechanism is reciprocated at predetermined intervals, as set forth.

9. In a machine for seaming sheet-metal vessels, the combination of a chucking mechanism, a shaft provided with a pinion, a roll or former carried by the shaft, a toothed segment arranged to mesh with the pinion, and suitable mechanism for actuating the segment, substantially as set forth.

10. In a machine for seaming sheet metal vessels, the combination of a live-spindle carrying a chuck, another spindle in line with the live one and having its opposing end provided with a bore, a spring seated in the bore, a block loosely arranged above the spring, a chuck having a stem that fits said bore and rests upon the block, and a seaming mechanism, substantially as set forth.

11. In a machine for seaming sheet-metal vessels, the combination of a live-spindle carrying a chuck, another spindle in line with the live one and having its opposing end provided with a bore, a spring seated in the bore, a block loosely arranged above the spring, a chuck having a stem that fits said bore and rests upon the block, mechanism for bringing the latter spindle to and from the former, and seaming mechanism, substantially as set forth.

12. In a machine for seaming sheet-metal vessels, the combination of two oppositely-arranged and movable spindles, a chuck carried by each spindle, a shaft carrying two cams having a portion thereof timed alike, a lever mechanism connecting each spindle with one

of the cams, and a seaming mechanism, substantially as set forth.

13. In a machine for seaming sheet-metal vessels, the combination of two oppositely-arranged and movable spindles, a chuck carried by each spindle, a shaft carrying two cams having a portion thereof timed alike, a lever mechanism connecting each spindle with one of the cams, a shaft carrying a roll or former, a segment geared to the shaft, a lever mechanism connected to the segment, and a cam for actuating the lever mechanism, substantially as set forth.

14. In a machine for seaming sheet metal vessels, the combination of a shaft carrying a roll or former and provided with a pinion, a toothed segment arranged to mesh with the pinion, a lever-arm, a rod adjustably connected to the segment and lever arm, and a cam for actuating said lever-arm, substantially as set forth.

15. In a machine for seaming sheet metal vessels, the combination of a main standard, a block pivoted to the standard and provided with an arm, a bearing arranged on the block, a rock shaft journaled in the bearing, a roll or former carried by the rock shaft, and a cam arranged to impinge against the arm of said block and move the latter on its pivot at predetermined intervals, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANCIS A. WALSH.

Witnesses:

N. E. OLIPHANT,

MAURICE F. FREAR.