(No Model.) 6 Sheets—Sheet 1.

L. COTÉ.

MACHINE FOR FORMING HEEL STIFFENERS.

No. 469,774. Patented Mar. 1, 1892.

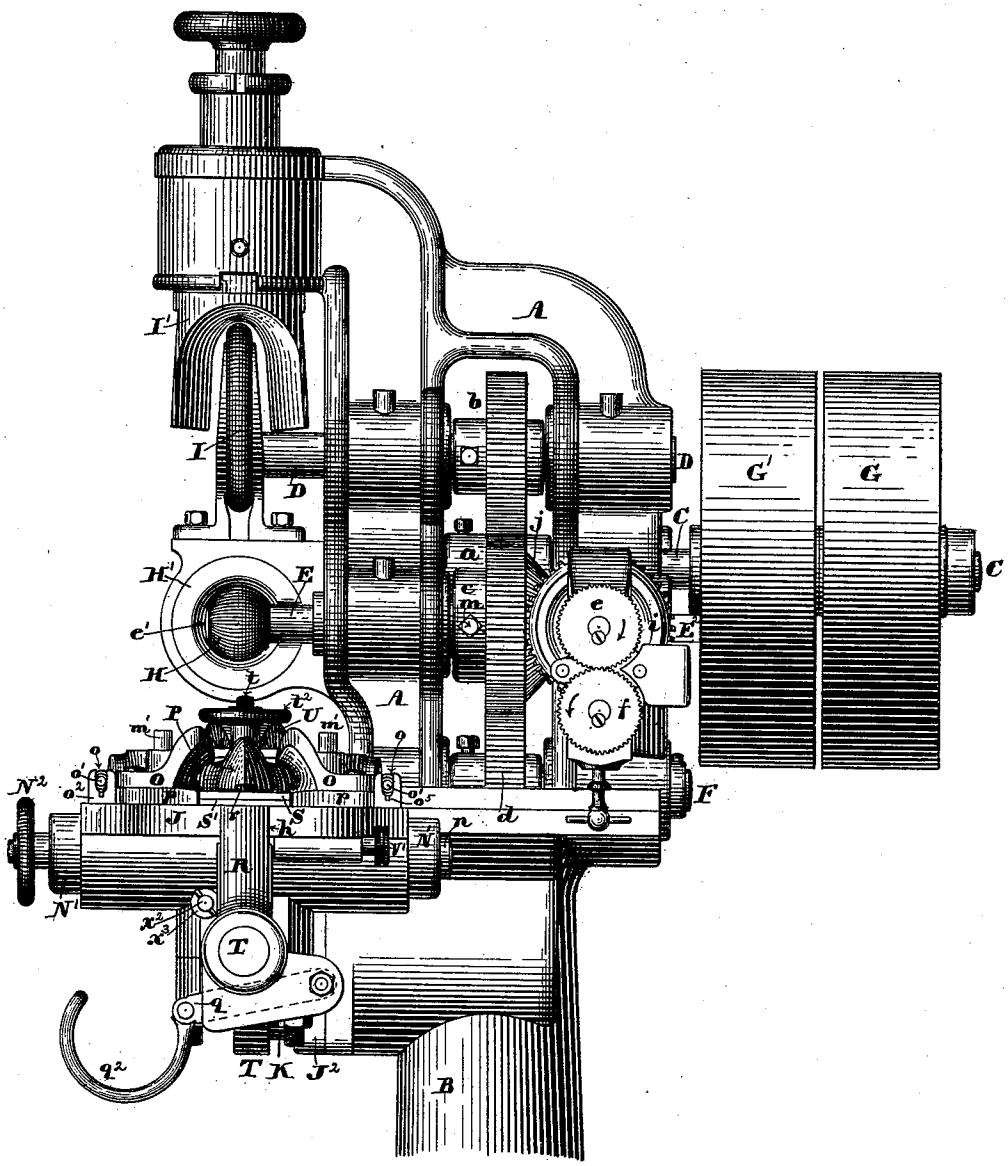

Fig. 1.

Witnesses:
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J. Clifford Entwisle

Inventor:
Louis Coté,
by N. G. Lombard
Attorney.

(No Model.) 6 Sheets—Sheet 2.

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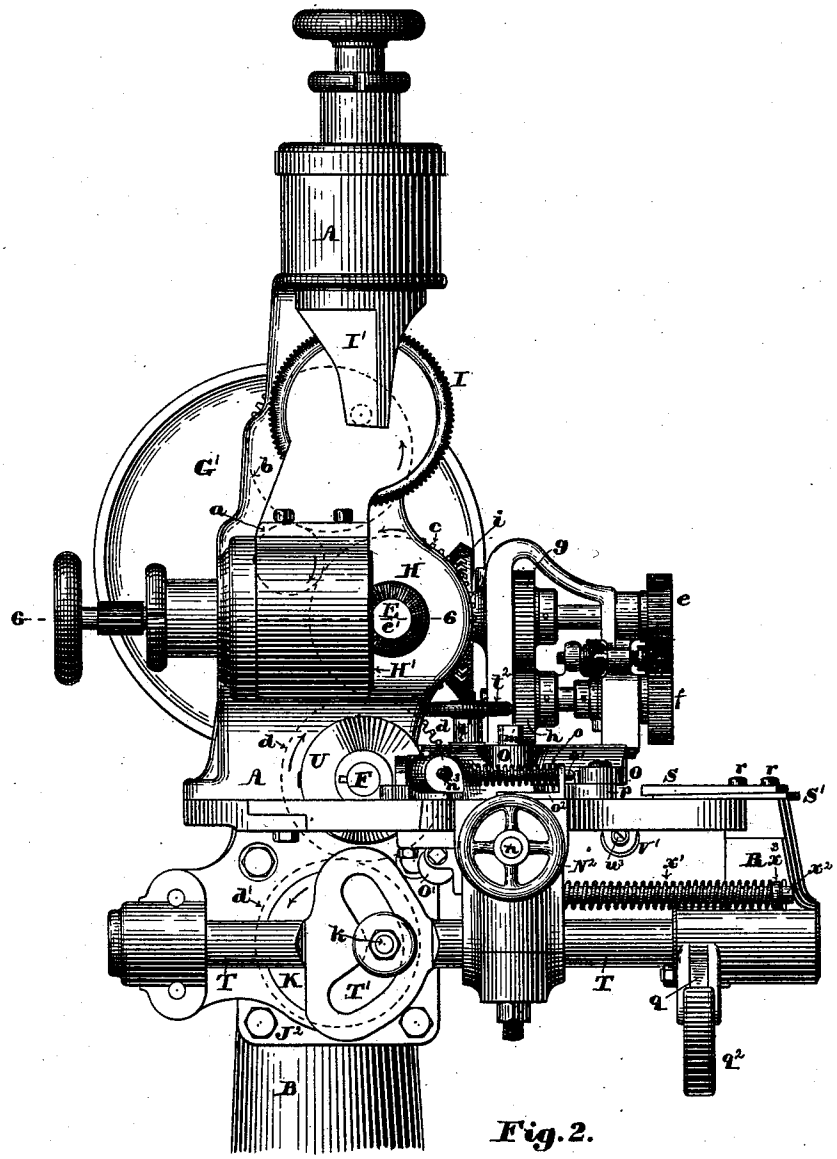

Fig. 2.

Witnesses:
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(No Model.) 6 Sheets—Sheet 3.

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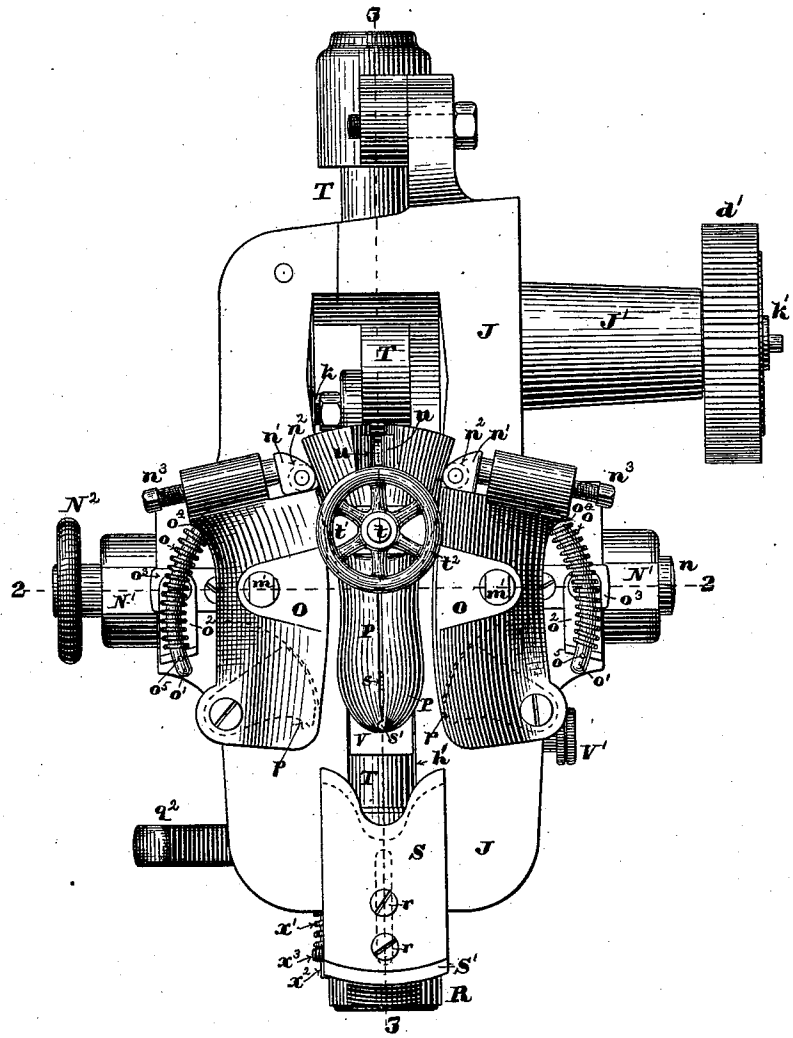

Fig. 3.

Witnesses:
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(No Model.) 6 Sheets—Sheet 4.

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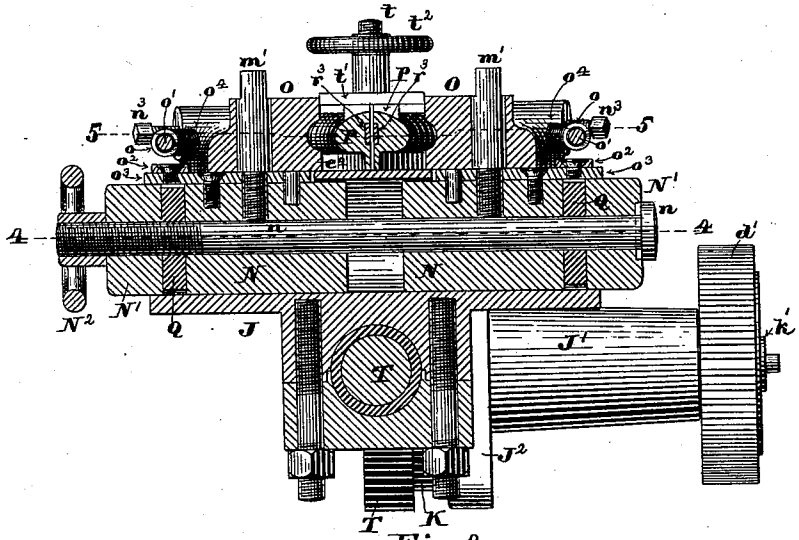

Fig. 4.

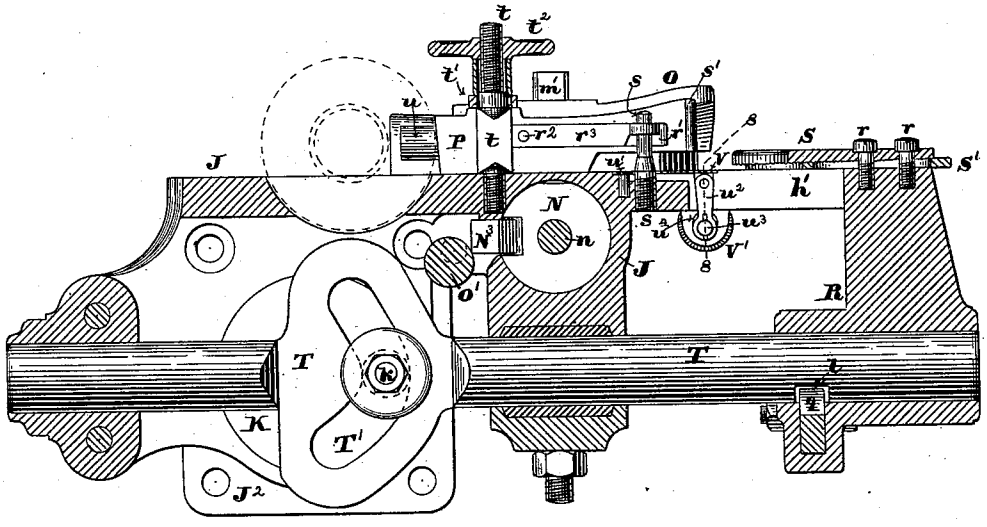

Fig. 5.

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(No Model.) 6 Sheets—Sheet 5.

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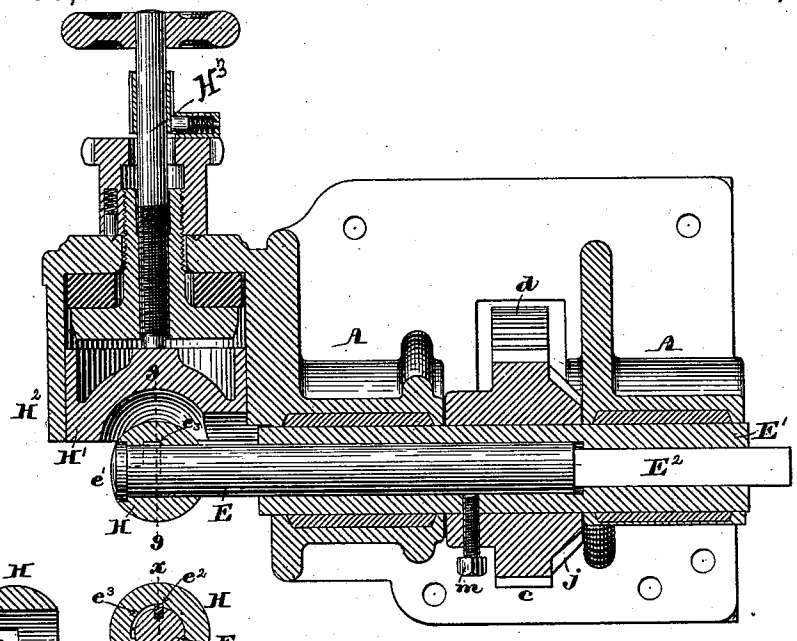

Fig. 8.

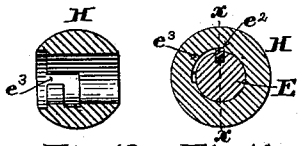

Fig. 12. Fig. 11.

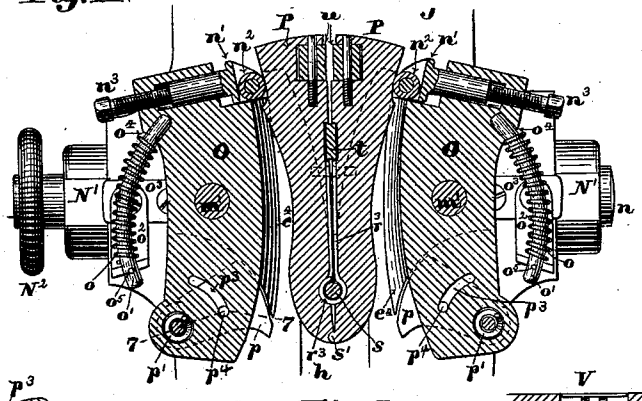

Fig. 7.

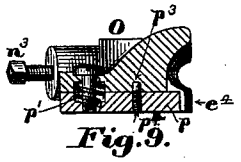

Fig. 9.

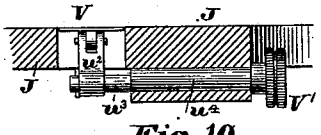

Fig. 10.

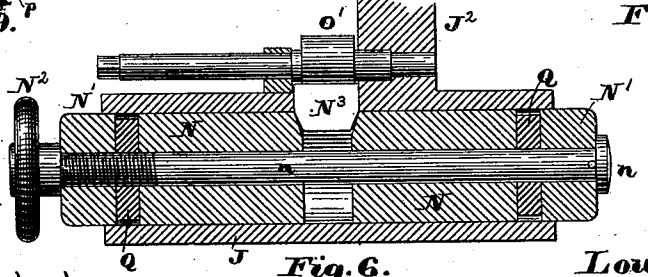

Fig. 6.

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(No Model.) 6 Sheets—Sheet 6.

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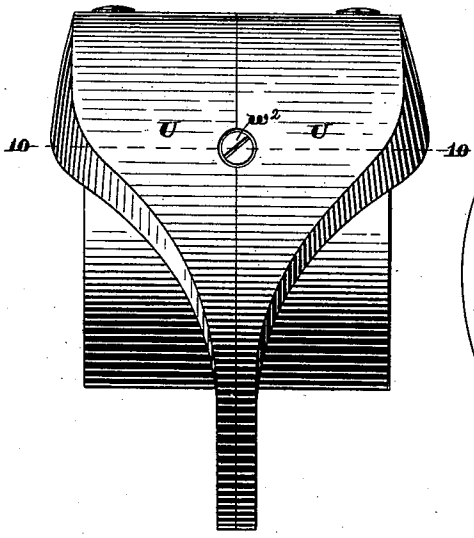

Fig. 13.

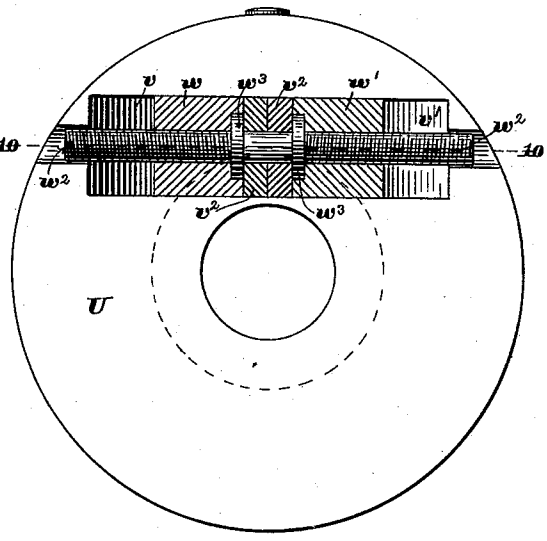

Fig. 15.

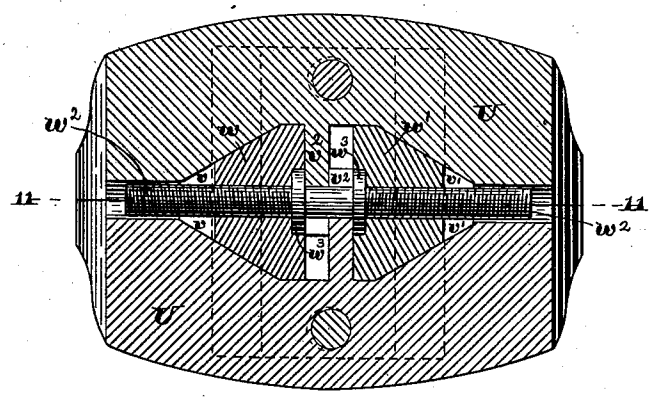

Fig. 14.

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J. Clifford Entwistle

Inventor:
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Attorney.

UNITED STATES PATENT OFFICE.

LOUIS COTÉ, OF ST. HYACINTHE, CANADA.

MACHINE FOR FORMING HEEL-STIFFENERS.

SPECIFICATION forming part of Letters Patent No. 469,774, dated March 1, 1892.

Application filed August 15, 1891. Serial No. 402,708. (No model.)

To all whom it may concern:

Be it known that I, LOUIS COTÉ, of St. Hyacinthe, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Machines for Forming Heel-Stiffeners, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to machines for forming heel-stiffeners and is an improvement upon the invention described in the Letters Patent No. 447,944, granted to me March 10, 1891; and it consists in certain novel features of construction, arrangement, and combination of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of so much of a machine as is necessary to illustrate my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a plan of the divided former, the molds and the table for supporting the same detached from the other parts of the machine. Fig. 4 is a vertical section on line 2 2 on Fig. 3. Fig. 5 is a vertical section on line 3 3 on Fig. 3. Fig. 6 is a horizontal section on line 4 4 on Fig. 4. Fig. 7 is a horizontal section on line 5 5 on Fig. 4. Fig. 8 is a partial horizontal section on line 6 6 on Fig. 2. Fig. 9 is a transverse vertical section through one of the side molds on line 7 7 on Fig. 7. Fig. 10 is a partial vertical section on line 8 8 on Fig. 5. Fig. 11 is a section of the spheroidal former and its shaft on line 9 9 on Fig. 8. Fig. 12 is a section of said former on line x x on Fig. 11. Fig. 13 is an elevation of the cam for operating the former. Fig. 14 is a sectional plan, the cutting plane being on line 10 10 on Fig. 13; and Fig. 15 is a section on line 11 11 on Fig. 14.

In the drawings, A is the main frame of the head of the machine supported upon the column B, only a small portion of which is shown, said frame having mounted in suitable bearings thereon the horizontal shafts C, D, E, and F.

G and G′ are the tight and loose pulleys on the shaft C.

a, b, c, and d are spur gear-wheels connecting said shafts; e and f, the fluted rolls for corrugating that portion of the counter-blank from which the flange or heel seat of the stiffener is to be formed, said rolls being connected together by the spur gears g and h, and have motion imparted thereto by the miter gear-wheels i and j.

H and H′ are respectively the former and mold for performing the second operation upon the blank and of imparting thereto curves both longitudinally and transversely.

I and I′ are respectively a revoluble disk and an adjustable mold for performing the third operation or the reshaping of the center or rear portion of the partially-formed or "clam-shell" counter-stiffener.

J is the table for supporting the molds and former for reshaping the sides of the stiffener, firmly bolted to the column B and having mounted in pendent bearings thereon the horizontally-reciprocating rod T, to which motion is imparted by the crank-pin k, set in the crank-disk K, secured on a short shaft k', mounted in a bearing in the hub J′, projecting horizontally from the foot or flange J^2 of said table J, said shaft k' having secured upon its other end the gear-wheel d', which engages with and has motion imparted thereto from the gear-wheel d. The rod T is provided with the notch l in its under side, with which the latch-lever q engages to lock said rod to the bracket or arm R, fitted to said rod and to a bearing in the slot h in the table J, and carrying at its upper end the flange-turner S.

So far the several parts are constructed, arranged, and operate substantially as described in my before-cited patent, except in some few matters of detail, which will be hereinafter explained.

In the machine described in my prior patent before cited, when it was necessary to change the spheroidal former and its mold or socket for one of a different size, the two caps to the bearings of the former shaft had to be removed, so that the shaft and the former fixed thereon could be removed to permit the mold to be removed. This was found to be objectionable on account of the time lost in making the change. To obviate this objection I mount in bearings in the frame A the sleeve-shaft E′, having formed therein a bearing for the shaft E, so constructed and the shaft E so fitted thereto that said shaft E and the sleeve E′ must revolve together, and at

the same time the shaft E may be adjustable endwise in its bearing in said sleeve to vary the position of the spheroidal former relative to its socket. In the machine illustrated I have accomplished this by making a portion of the inner end of the shaft E square, as shown at E^2, and forming a portion of the bore of the sleeve E′ of a corresponding shape and securing the shaft E in the desired position in said sleeve by means of the set-screw *m*, which passes through the hub of the gear *c*, fast on the sleeve E′, and through said sleeve, as shown in Fig. 8. The left or outer end of the shaft E has formed thereon a head *e′*, which fits into a counterbore in the former H, and the shaft has set in its side, a short distance to the right of said head, the stud e^2. The former H has a hole through it to fit the shaft E at its headed end, and has formed in its inner wall the L-shaped groove e^3, as seen in Fig. 12, into which the stud e^2 enters as the former is moved toward the head *e′*, and locks it in position when said former is turned, so as to bring the stud e^2 into the circumferential portion of said groove. By this construction of the shaft E, sleeve E′, and former H the former and mold H′ can be very readily and easily removed and replaced by simply turning out the set-screw H^3 and pushing back the mold H′ to the position shown in Fig. 8, turning the former on the shaft E until the stud e^2 is in line with the longitudinal portion of the groove e^3, then loosening the set-screw *m*, when the shaft E may be withdrawn from its sleeve and from the former, and then the mold H′ can be readily removed from its socket H^2. This is an important feature of my invention and is of great advantage.

The side-shaping molds O O are mounted upon studs *m′*, set in the pistons N, which pistons are pressed toward each other by the rubber springs Q Q, substantially as shown and described in my before-cited prior patent. In my present invention, however, the tensions of the springs Q Q are adjusted by means of the tension-bolt *n*, which passes through the centers of the pistons N, the springs Q, and the followers N′ N′, and is provided with the wheel-nut N^2, as shown in Fig. 4.

The inner ends of the pistons N are beveled to form a suitable surface for the stop-wedge N^3 to engage with to limit the inward movement of said pistons, said wedge being constructed and arranged to be forced inward to a greater or less distance from the centers of said pistons by the action thereon of the eccentric O′, as shown in Figs. 5 and 6.

The inner ends of the molds O O have mounted therein the forked studs *n′ n′*, each carrying in its forked end an anti-friction roll n^2, against which a suitable surface on the outer sides of the two parts of the divided former P near their inner ends bears, said rolls and studs being adjustable toward and from said formers by means of the set-screws n^3, as shown in Figs. 3, 4, and 7. The roll n^2 is kept in contact with the former by the tension of the spring *o*, mounted upon the curved rod *o′*, fixed at one end in a hole in said mold O and resting at its other end in an open slot in the movable end of the plate o^2, the slotted end of which is turned at right angles to its main body, and the opposite end of which is pivoted to the plate o^3, secured to the piston N, the spring *o* being compressed between the shoulder o^4 of the mold O and the upturned slotted portion of the plate o^2, and the rod *o′* being provided in its outer end with the pin o^5, to serve as a stop to limit the inward movement of the inner end of the mold, all as shown in Figs. 1, 3, and 7.

In my prior patent the molds O were provided with lips to project under the former to turn the side portions of the flange or heel-seat of the stiffener, and a notched reciprocating plate was used to turn the central portion of said flange or heel-seat, and in order to allow the requisite motion to be given to said plate when the molds were clamping the stiffener between them and the former a portion of the lip on each mold had to be cut away. This was found to be objectionable on account of the said lips being thus made too short, so that they did not turn the side portions of the flange sufficiently near to the heel end of the former. This objection is obviated in my present invention by pivoting to the under side of each of said molds O the segmental plate *p*, fitted to fill or partially fill the space formed by cutting away the lip e^4, said plate being normally held in the position shown in Fig. 7 by the tension of the spring *p′*, thus forming an extension of the shortened lip e^4, and at the same time said plate is movable about its pivot p^4 by the forward or inward movement of the notched flange-turning plate S, and limited in its outward movement by the stop-pin p^2 coming in contact with the end of the slot p^3, as shown in Fig. 7.

In my prior patent the flange-turning plate S was secured in a fixed position on the arm R, which was fitted to be reciprocated in the slot *h′* by the rod T, to which it was connected by the latch-lever *q*, which was located above said rod T and was moved into engagement with the notch *l* by means of a treadle on the floor, and was disengaged by a spring, said rod T being provided with a vertical slot, into which projected a crank-pin by which said rod and flange-turner were reciprocated.

In my present invention the notched flange-turning plate S has its under side slightly inclined and roughened or serrated, and has inserted beneath it the correspondingly-tapered plate S′, the upper surface of which is also roughened or serrated, said plates S and S′ being secured to the upper end of the arm R by the bolts *r r*, said plate S′ being slotted, so that it may be adjusted endwise beneath the plate S in such a manner as to raise or lower said plate S to adapt it to different thicknesses of stock.

The latch-lever q, instead of being placed above the rod T, is placed below it and has adjustably pivoted and clamped to its movable end the segmental arm q^2, which the operator touches with his knee to cause said lever to engage the notch l in the rod T, the force of gravity disengaging said lever from said notch when the pressure of the knee is removed.

Instead of making the slot T′ vertical or at right angles to the axis of the rod T, as in my prior patent, I make it curved, with its central portion having a radius at its center line equal to the radius of the crank K, as shown in Fig. 5, whereby the rod T, when at the extreme of its outward movement, has a standstill or rest during nearly one-quarter of the revolution of the crank K, during which time the latch-lever q may be engaged with or disengaged from the notch l with certainty. The curved arm q^2, clamped to the movable end of the latch-lever q, may be adjusted about its pivotal connection to said lever to raise or lower the under side thereof to adapt it to the height of the operator's knee.

The former P is made in two halves, divided longitudinally, as described in said prior patent; but instead of the two parts being hinged together at a point somewhat removed from the heel end of the former, about which point the said two parts vibrate, and having their heel ends beveled on their inner faces to permit said vibration, as in my prior patent, I now form longitudinal recesses r' in the inner faces of the two parts of the former P, in which I secure by screws or rivets r^2 the springs r^3, the opposite end of each spring having formed therein an eye to fit on the stud s, set in the table J, said springs serving to prevent any endwise movement of the former and at the same time permit the two parts thereof to vibrate about a point at the extreme heel end of the former, as represented by the semi-cylindrical rib or lip s' on one part of the former, which fits into a correspondingly-shaped recess in the other part, as clearly shown in Figs. 3 and 7.

A stud t is set in the table J and projects upward therefrom between the two parts of the former P, and has fitted thereon the cross-bar t' and the wheel-nut t^2 for the purpose of preventing the former from being lifted by the action of the lips e^4 on the molds in turning the flange under said former. The inner ends of the two parts of the former P have mounted therein the anti-friction rolls $u\,u$ in position to be acted upon by the cam U in forcing said inner ends outward or away from each other. The cam U is divided transversely of its axis of revolution into two parts, each part having formed in its inner face two rectangular recesses $v\,v'$, the bottoms of which are inclined toward each other and separated from each other by the rib v^2, as shown in Fig. 14. Two wedges $w\,w'$ are placed in said recesses between said two parts of the cam and are adjustable toward and from each other by the screw w^2, having formed thereon two collars w^3 near the middle of its length which embrace the slotted ribs v^2, and having formed on one end thereof a right-hand screw-thread and on its other end a left-hand screw-thread, which threads fit correspondingly-threaded holes in the wedges $w\,w'$, so that by turning said screw the wedges may be moved toward or from each other and thus expand said cam U in the direction of the length of its axis to compensate for the wear of the operating-surface of said cam and the peripheries of the rolls $u\,u$, all as shown in Figs. 13, 14, and 15.

V is a spring-plate, attached to the table J at its inner end by rivets or screws u' and extending beyond the heel end of the former P, and has pivoted to ears on its under side, near its outer end, the connecting-rod u^2, the lower end of which is fitted to the crank-pin u^3, carried by the shaft u^4, provided on its other end with the milled wheel V′, by means of which the outer end of said plate may be adjusted to a higher or lower level to gage the width of flange to be turned on the stiffener, all as shown in Figs. 5 and 10.

The shaft E and sleeve E′ may be fitted together, so as to be revoluble together, and the shaft movable endwise in said sleeve in other ways than that shown—as, for instance, the bore of the sleeve may be cylindrical its entire length, and a short key, gib, or pin may be set therein, so as to project into said bore, and the shaft may be cylindrical throughout its length, except that it may have a longitudinal groove or keyway formed therein, into which the key, gib, or pin enters to insure the rotation of the shaft with said sleeve.

The operation of my invention will be readily understood from the foregoing without further description herein.

The notched flange-turner S will be moved outward by the action of the spring x', mounted on the rod x^2, fixed at one end in a pendent part of the table J, and having a bearing at its other end in an eye x^3, set in the arm R, as shown in Fig. 2.

I claim—

1. In a machine for forming heel-stiffeners, the combination, with the frame A, provided with the mold-socket H, of the mold H′, fitted to and movable in said socket, the sleeve-shaft E′, mounted in bearings in said frame, the shaft E, mounted in said sleeve so as to be revoluble therewith and movable endwise therein and provided with the head e' and the stud e^2, and the spheroidal former H, provided with an axial bore to receive said shaft E, and with the L-shaped groove e^3 to receive the stud e^2, substantially as described.

2. In a machine for forming heel-stiffeners, the combination, with a former divided longitudinally into two parts and constructed and arranged to be movable about a fulcrum at the heel end of said former, and a double-faced cam for moving the free ends of said parts away from each other, of two pivoted

side molds, each provided with a curved rod set therein near one end, a spring on said rod, and a pivoted plate having a slotted upright portion at its free end to serve as a bearing for the free end of said curved rod, and an abutment for said spring.

3. In combination with the divided former P, provided with a lip or lips on its under side, and a revolving wedge-like cam for moving the free end of the two parts of said former away from each other, a pair of pivoted side molds, arranged one upon each side of said former and each provided with a lip extending about four-fifths (more or less) of its length from its inner end and adapted to pass beneath said former to turn portions of the flange on the side of the stiffener, a segmental plate pivoted to the under side of said mold at or near its front or outer end and constructed and arranged to serve as an extension of said flange-turning lip, a spring the tension of which tends to maintain said plate in its normal position, a stop to limit the movement of said plate in the direction which it is pressed by said spring, and a reciprocating notched plate for turning the heel portion of the stiffener-flange and constructed and arranged to abut against and move said segmental plate about its axis against the tension of said spring when said flange-turner is moved inward to turn the heel portion of the flange.

4. In combination with the divided former P, the two parts of which are fulcrumed at or near the heel end thereof, and a wedge-like cam for moving the free ends of said two parts away from each other, the pivoted side molds O O, each provided with an adjustable anti-friction roll to bear against the side of said former at or near its movable end.

5. The combination of the former P, divided longitudinally into two parts and fulcrumed at or near the heel end thereof and provided at or near their opposite ends with anti-friction rolls, and a wedge-like cam constructed and arranged to act upon said rolls to force the free ends of the two parts of said former asunder, substantially as described.

6. The combination of the former P, divided longitudinally into two halves, each provided in its inner face with a longitudinal recess, a vertical semicircular rib on the inner face of one of said halves at its heel end, a correspondingly-shaped groove or recess in the inner face of the other half at its heel end to receive said rib, a leaf-spring secured by one end to each of said halves within said longitudinal recesses and having formed in its other end a circular eye, the table J, and a stud set in said table and projecting upward therefrom through the eyes in said two springs, substantially as described.

7. In a machine for forming heel-stiffeners, the combination, with the longitudinally-divided former P and the pivoted side molds O O, of the notched flange-turning plate made in two parts, one above the other, and having their contiguous faces inclined to a horizontal plane and serrated or roughened, and suitable means for securing said parts together and to their carrying-arm, whereby the upper or working face of said plate may be adjusted to a higher or lower level.

8. The combination of the divided former P, the pivoted side molds O, provided with lips to pass beneath the former to turn the side portions of the flange or heel seat, a cam for vibrating the two parts of the former and the side molds, and a holding-down bar for preventing the two parts of the former from being lifted when the flange or heel-seat is being turned.

9. The combination, with the divided former P, the pivoted side molds O O, the notched flange-turning plate S, and its carrier-arm R, of the horizontally-reciprocating rod T, provided with the notch *l* and the curved slot T′, the constantly-revolving crank K *k*, and the latch-lever *q*, pivoted to said arm R and adapted to engage the notch *l* in the rod T, substantially as described.

10. The combination of the notched flange-turning plate S, its carrier-arm R, the rod T, provided with the notch *l* and the slot T′, the crank K *k*, the latch-lever *q*, and the adjustable segmental extension q^2 of said lever.

11. In combination with the divided former P, the side molds O O, provided with flange-turning lips, and the notched reciprocating flange-turning plate S, the spring-plate V, arranged beneath the heel portion of the former, and mechanism having provision for raising or lowering the movable end of said plate, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 10th day of August, A. D. 1891.

LOUIS COTÉ.

Witnesses:
F. X. A. BOISSEAU,
J. P. BAZINET.