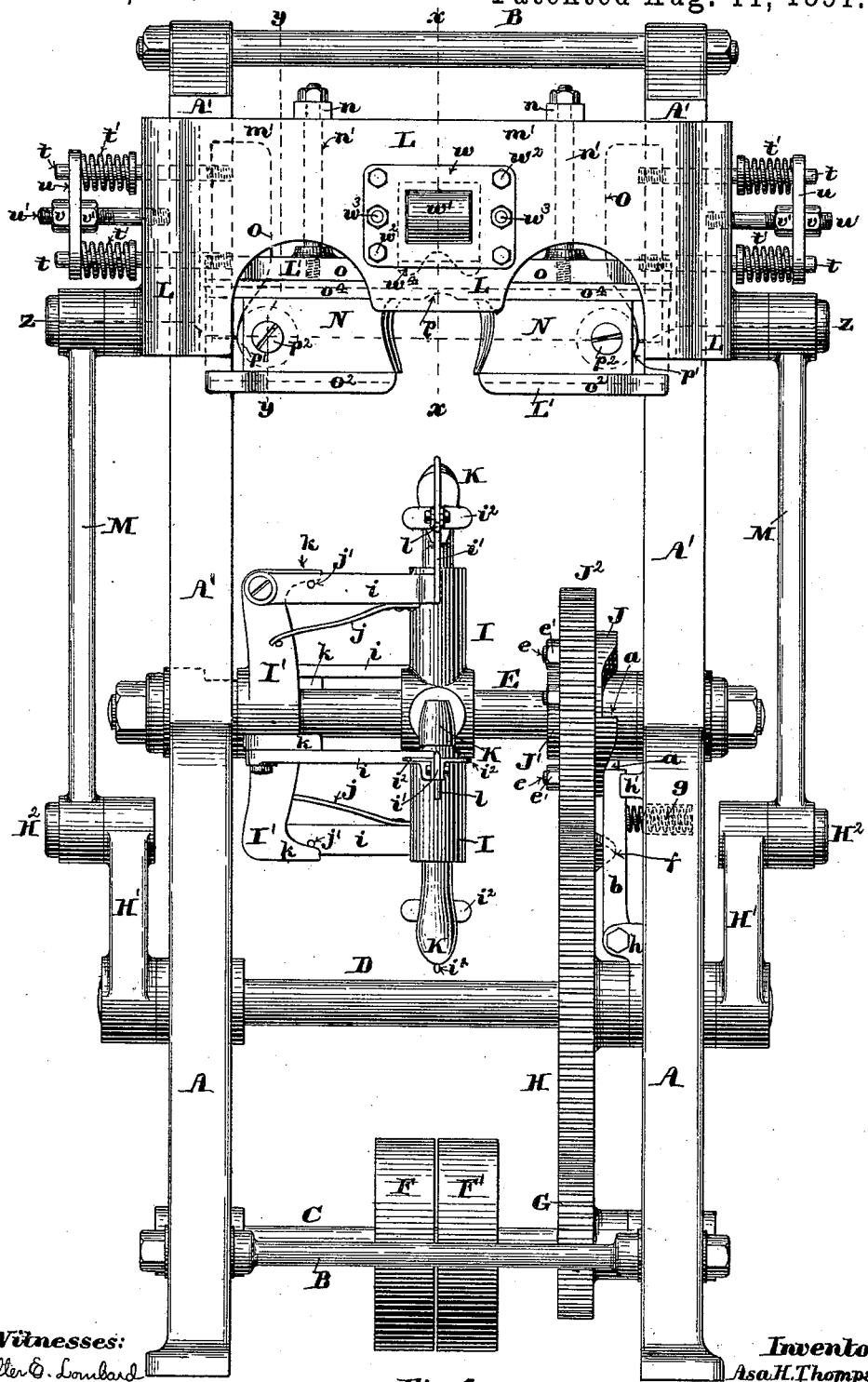
(No Model.) 3 Sheets—Sheet 1.

A. H. THOMPSON.

HEEL STIFFENER MACHINE.

No. 457,412. Patented Aug. 11, 1891.



Witnesses:
Walter D. Lombard
Robert B. Eddy

Fig. 1.

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Asa H. Thompson,
by N. D. Lombard
Attorney.

(No Model.)

3 Sheets—Sheet 2.

A. H. THOMPSON.

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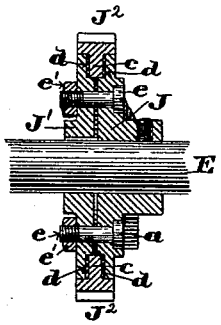

Fig. 8.

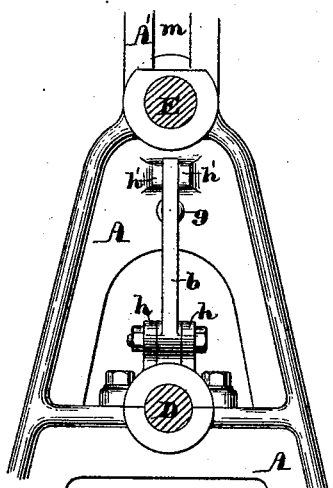

Fig. 7.

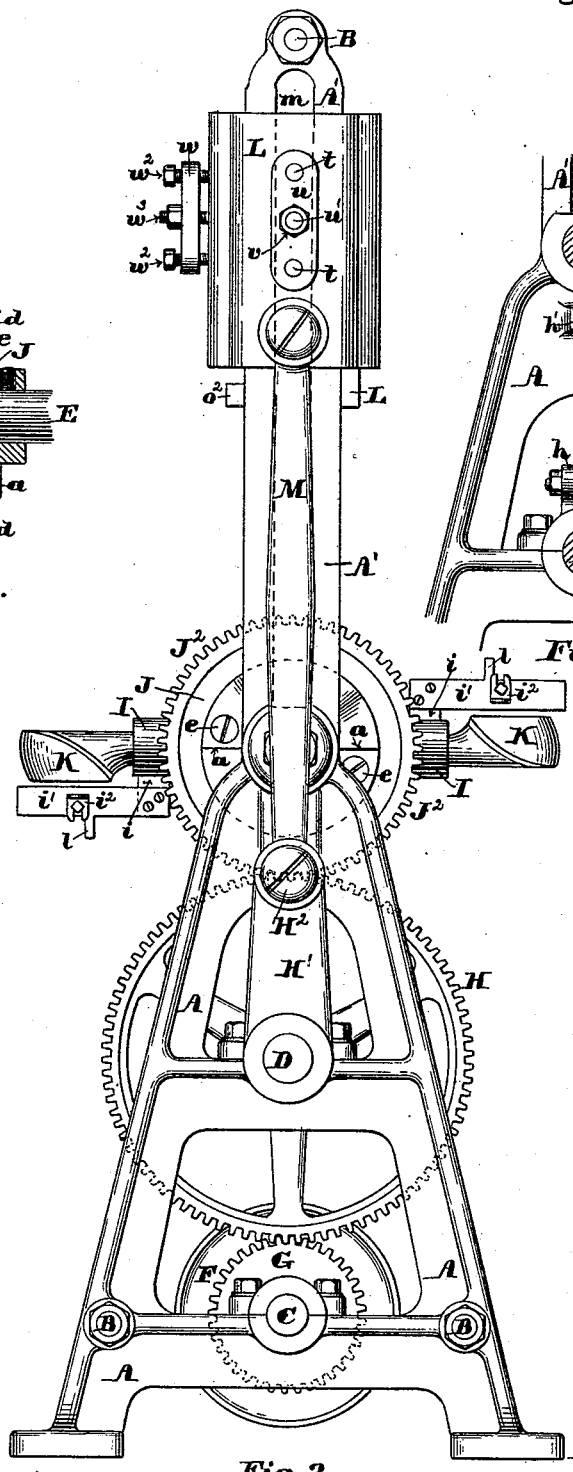

Fig. 2.

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

A. H. THOMPSON.

HEEL STIFFENER MACHINE.

No. 457,412. Patented Aug. 11, 1891.

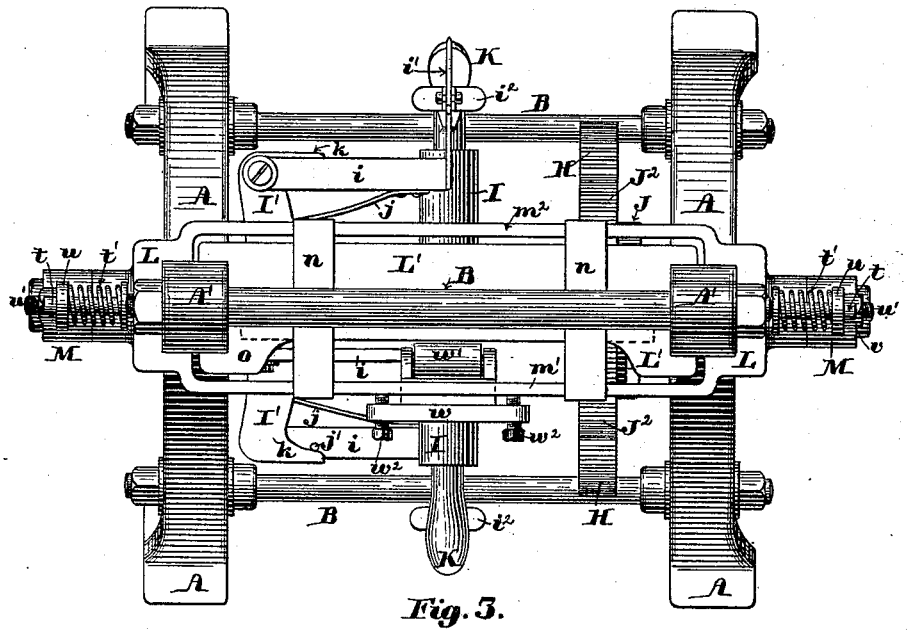

Fig. 3.

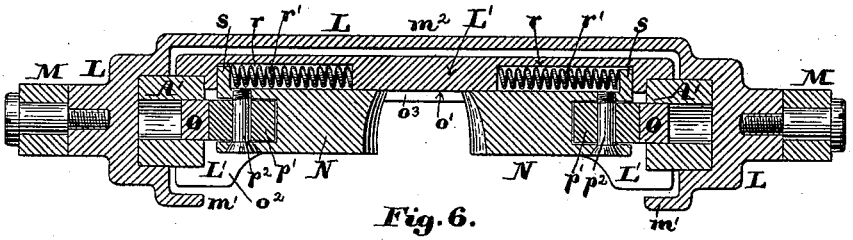

Fig. 6.

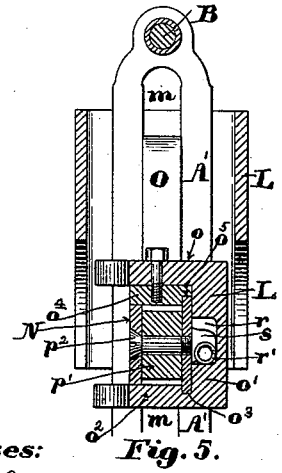

Fig. 5.

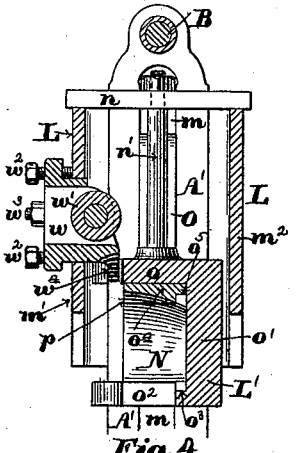

Fig. 4.

Witnesses:
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Inventor:
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by N. C. Lombard
Attorney.

UNITED STATES PATENT OFFICE.

ASA H. THOMPSON, OF GROTON, ASSIGNOR TO SPAULDING BROTHERS, OF TOWNSEND, MASSACHUSETTS.

HEEL-STIFFENER MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,412, dated August 11, 1891.

Application filed May 7, 1891. Serial No 391,852. (No model.)

To all whom it may concern:

Be it known that I, ASA H. THOMPSON, of Groton, in the county of Middlesex and State of Massachusetts, 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 to that class of such machines which are used for reshaping the stiffeners after they have been partially formed by a previous operation; 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 a machine embodying my invention. Fig. 2 is an end elevation. Fig. 3 is a plan. Fig. 4 is a vertical section of the reciprocating cross-heads on line *x x* on Fig. 1. Fig. 5 is a similar section on line *y y* on Fig. 1. Fig. 6 is a horizontal section on line *z z* on Fig. 1. Fig. 7 is an elevation of the inner face of a portion of the left-hand end frame of the machine and the stop-lever for locking the former-carrying shaft, and Fig. 8 is a section of the frictionally-acting gear for driving the former-carrying shaft.

In the drawings, A A are the end frames of the machine connected together by the tie-rods or girts B B, and having mounted in suitable bearings formed thereon the shafts C, D, and E. The shaft C has mounted thereon the tight and loose pulleys F and F′ and the pinion G, the teeth of said pinion engaging with the teeth of the gear-wheel H, firmly secured upon the shaft D, which projects beyond its bearings at each end and has secured thereon the cranks H′ H′, one at each end, as shown. The shaft E has firmly secured thereon the four-armed spiders I and I′ and the disk J, the latter having formed upon its outer face the four stop-shoulders *a a*, which co-operate with the stop-lever *b* to lock said shaft E and intermittently stop its revolution. A second disk J′ is fitted to said shaft E in such a manner that it may be moved endwise thereon and at the same time be compelled to revolve therewith.

J^2 is a ring-gear provided with the inwardly-projecting rib *c*, which fits between the disks J and J′, with annular packings *d d* of leather or other suitable frictional material interposed between the inner surfaces of said disks and said rib, said disks being clamped together with just sufficient force by the bolts *e* and nuts *e′* to create the requisite friction to cause said disks, the shaft E, and the spiders I and I′ to be moved about the axis of said shaft by the action of the spur-gear H upon the ring-gear J^2 whenever the stop-lever *b* is removed from contact with the shoulder *a*, which is accomplished once to each revolution of the shaft D by the action of the cam *f*, formed upon the rim of the gear-wheel H, upon said lever *b* to move it against the tension of the spring *g*, which tends to press said lever toward the disk J. The lever *b* is pivoted to ears *h h*, formed on the cap of the bearing for shaft D, in the right-hand frame A, and its free end is guided in its vibrations and held in position against the impact of the shoulders *a a* by the ears *h′ h′* cast upon the frame A.

The spider I has fitted to a socket in each arm thereof a heel-shaped former K, said spider being so arranged on its shaft that when one of the shoulders *a* is in contact with the lever *b* the center lines of two of the arms shall be vertical and the other horizontal, as shown in Figs. 1 and 2.

Each of the four arms of the spider I′ has pivoted to its outer end an arm *i*, to the inner end of which is firmly secured at right angles thereto the arm *i′*, to which is adjustably secured the gage-plates i^2 i^2, upon which and the end of the arm *i′* the lower edge of the partially-formed stiffener rests when placed upon the former in the horizontal arm of the spider I at the front of the machine, the end of the arm *i′* entering the notch in the center of the flange-edge of the counter-stiffener to properly center or register the same on the former. The inner faces of the gage-plates i^2 i^2 are adjusted to a distance from the tread-surface of the former K equal to the width of the flange that it is desired to have formed on the stiffener.

The arms *i i* are maintained in their normal positions substantially parallel to the axis of the shaft D by the springs *j j*, the tensions of which force the free ends of said arms upward until the pins *j' j'* come in contact with the lugs *k k* projecting inward from the inner edges of the arms of said spider I', as shown in Figs. 1 and 3.

The arms *i' i'* are each provided with the laterally-projecting pin or lug *l*, with which the center of the lower edge of the cross-head L comes in contact when it is moved downward to move the gage-plates i^2 and the arm *i'* out of the way of the flange-turning roll.

The upper portions A' of the frames A A are straight bars, having their outer edges and sides planed so as to form guideways for the cross-heads L and L', and each of said bars has formed therein a slot *m*, which extends from near the upper ends of said frames to the bearing of the shaft E, as shown in Figs. 2 and 7.

The cross-head L consists of two parallel plates *m' m²* connected together outside of the guide-bars A', all formed in one piece and fitted to slide upon the guide-bars A, as shown in Fig. 3, and has pivoted thereto one end of each of two connecting-rods M M, one at each end, the opposite ends of which are mounted upon the crank-pins H^2 H^2, as shown in Figs. 1 and 2.

The cross-head L' is fitted to slide on the inner portions of the guide-bars A', and is supported in its normal position by the bars *n n* resting upon the upper edges of the side plates *m' m²*, and the rods *n' n'* screwed into said cross-head by their lower ends, and at their other ends into said bars *n n*, as shown in Fig. 1.

The cross-head L' is in the form of a grooved bar having upper plate *o*, back plate *o'*, and bottom plate o^2, the latter being provided with the guiding-groove o^3, and having its central portion cut away, as shown in Figs. 1, 4, and 6. To the under side of the upper plate *o* is bolted the plate o^4, having its inner lower corner rabbeted, as at o^5, and has formed in the center of its length and its under side a shallow-curved cavity *p*, of a shape to fit a portion of the rear or heel end of the former K, as shown in Fig. 4 and in dotted lines in Fig. 1.

N N are two side jaws fitted to slide horizontally in the cross-head L', being guided therein by lips formed thereon and fitting in the grooves o^3 and o^5, and each having mounted in a recess in its outer end a roll *p'*, arranged to rotate on its axial pin p^2, as shown in Figs. 1, 5, and 6. The inner ends of the sliding jaws N N are molded to conform to and fit the sides of the former K, as shown in Figs. 1, 4, and 6.

The back plate *o'* has formed in its inner face two recesses *r r*, in which are placed the coiled springs *r' r'*, the outer ends of which are engaged by the lugs or ears *s s* projecting from the back sides of the jaws N at their outer ends, so that the tension of said springs shall act to force said jaws outward or away from the former K and keep the rolls *p'* in contact with the cams O, all as shown in Figs. 1, 5, and 6.

The cams O O are fitted to move up and down with the cross-head L, being mounted on the rods *t t*, fitted to bearings in said cross-head, and provided with the springs *t' t'*, which tend to force said cams inward and yield to compensate for any variation in the thickness of the stock of which the counter-stiffeners are composed, said springs *t' t'* being made of the requisite stiffness to impart sufficient pressure to the stiffener on the former K, when said side jaws or molds are forced inward by the cams O O. The tensions of said springs *t' t'* may be regulated to a limited extent by adjusting the bar *u* on the stud *u'* by means of the nuts *v* and *v'*, as shown in Figs. 1, 2, and 3.

The front plate *m'* of the cross-head L has cut through it at the center of its length a rectangular opening, in which is fitted the flanged housing *w*, in which is mounted, so as to be revoluble therein, the flange-setting roll *w'*, the same being adjustable toward or from the center of said cross-head by means of the set-screws w^2 and clamping-bolts w^3. The housing *w* has formed on the inner edge of its lower side a downwardly-projecting lip w^4, in which is formed an obtuse V-shaped notch, which acts upon the flange portion of the counter-stiffener to turn said flange in advance of the action of the roll *w'* thereon to set the same.

The operation of my invention is as follows: The parts being in the positions shown in the drawings and a partially-formed counter-stiffener, such as is termed by the trade a "clam-shell counter," being upon the upper former K, if the shaft C be set in motion by shipping the belt (not shown) from the loose pulley F' to the tight pulley F, the shaft D will be revolved, the two cross-heads L and L' will be moved downward together until the molded recess in the plate o^4 rests upon and clamps the center portion of the stiffener to the upper end of said upper former, when the continuation of the revolution of the shaft D causes the cross-head L to continue its downward movement, carrying with it the cam-blocks O O, thereby forcing the side mold-jaws inward upon the sides of the stiffener and firmly clamping them to the former K, when the lower edge of the front plate *m* comes in contact with the pin or lug *l* and moves the stiffener-gage, with the arms *i* and *i'* downward, to uncover the tread-surface of the former when the flange-turning lip w^4 comes in contact with and turns the flange down upon the tread-surface of the former and the roll *w'* following sets the flange by giving it an increased pressure. While this is being accomplished the shaft E remains stationary, being prevented from revolving by the stop-lever *b* and the shoulder *a* on the

disk J, the ring-gear J^2 revolving without moving the disks J and J′, and during this time the operator places another clam-shell counter on the front horizontal former, preparatory to its being carried into the position occupied by the upper former in the drawings. When the shaft D has completed a half-revolution and commences on its other half-revolution, the cross-head L moves upward, carrying with it the flange-turner and setting-roll and the cams O O, until the side jaws N are moved away from the former by the springs r', when the upper edges of the plates m' and m^2 of the cross-head L come in contact with the bars n n, and then both cross-heads move upward together. In the meantime the cam f on the side of the gear-wheel H has forced the stop-lever b outward against the tension of the spring g to release the shoulder a, when the friction between the disks J J′ and the ring-gear J^2 will cause the shaft E to move about its axis to carry the front horizontal arms of the spiders I and I′ into upright positions, the spring j having in the meantime moved the arms i and i' and the stiffener-gage, that were moved downward by the descent of the cross-head L, into their normal positions relative to the former to which they belong.

The operations above described will be repeated at every revolution of the shaft D.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a counter-stiffener machine, the combination of an intermittently-rotating shaft, a plurality of formers carried thereby and radiating therefrom, a frictionally-mounted gear on said shaft, a stop-lever and a ratchet-like stop-wheel for locking said shaft against revolution, a cam for releasing said stop, a pair of reciprocating cross-heads, one within the other and guided by the same guide-bars, a crank mechanism connected to and adapted to impart a positive reciprocation to said outer cross-head, a pair of reciprocating cams carried by said outer cross-head, and a three-part mold carried by said inner cross-head, one of which is in a fixed position thereon and the other two are fitted to be moved toward and from each other and the former by said reciprocating cams and the springs r' r'.

2. The combination of the guide-frames A′ A′, the cross-heads L and L′ guided thereby, the revolving shaft D, the cranks H′, the connecting-rods M M, the cams O O, carried by said cross-head L, the springs l' l' for pressing said cams inward, the bars n n, connected to the cross-head L′ in positions to be engaged by the cross-head L, the former K, held in a fixed position while the counter is being shaped, the rear section p of the divided mold, the side jaws or sections N of the mold, each provided with the roll p', the notched flange-turner w^4, and the flange-setting roll w'.

3. In combination with the revolving shaft D, the spur gear-wheel H, provided with the side cam f, the shaft E, the disks J and J′, the former provided with a plurality of shoulders a on its outer side, the ring-gear frictionally mounted on and clamped by said disks, the stop-lever b, the spring g, and the spider I, having mounted thereon a plurality of heel-shaped formers K, constructed and arranged to be intermittently moved about the axis of said shaft E, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 2d day of May, A. D. 1891.

ASA H. THOMPSON.

Witnesses:
N. C. LOMBARD,
WALTER E. LOMBARD.