No. 820,510. PATENTED MAY 15, 1906.

F. W. MALLETT.

MACHINE FOR FORMING METALLIC STAYS FOR GARMENTS.

APPLICATION FILED JULY 6, 1905.

7 SHEETS—SHEET 1.

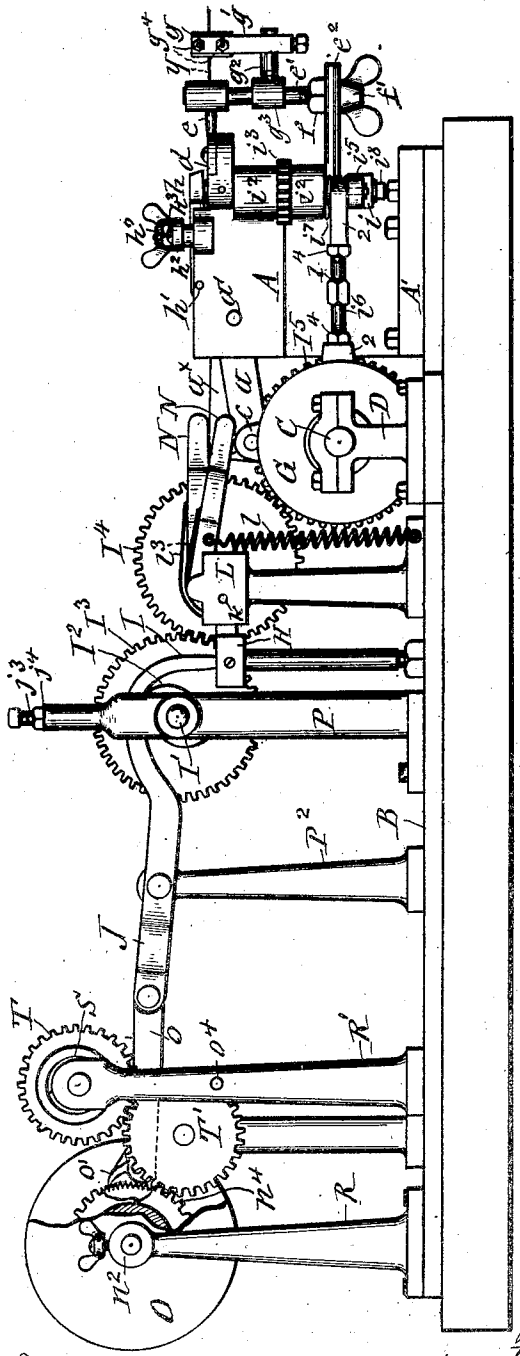


Fig. 1.

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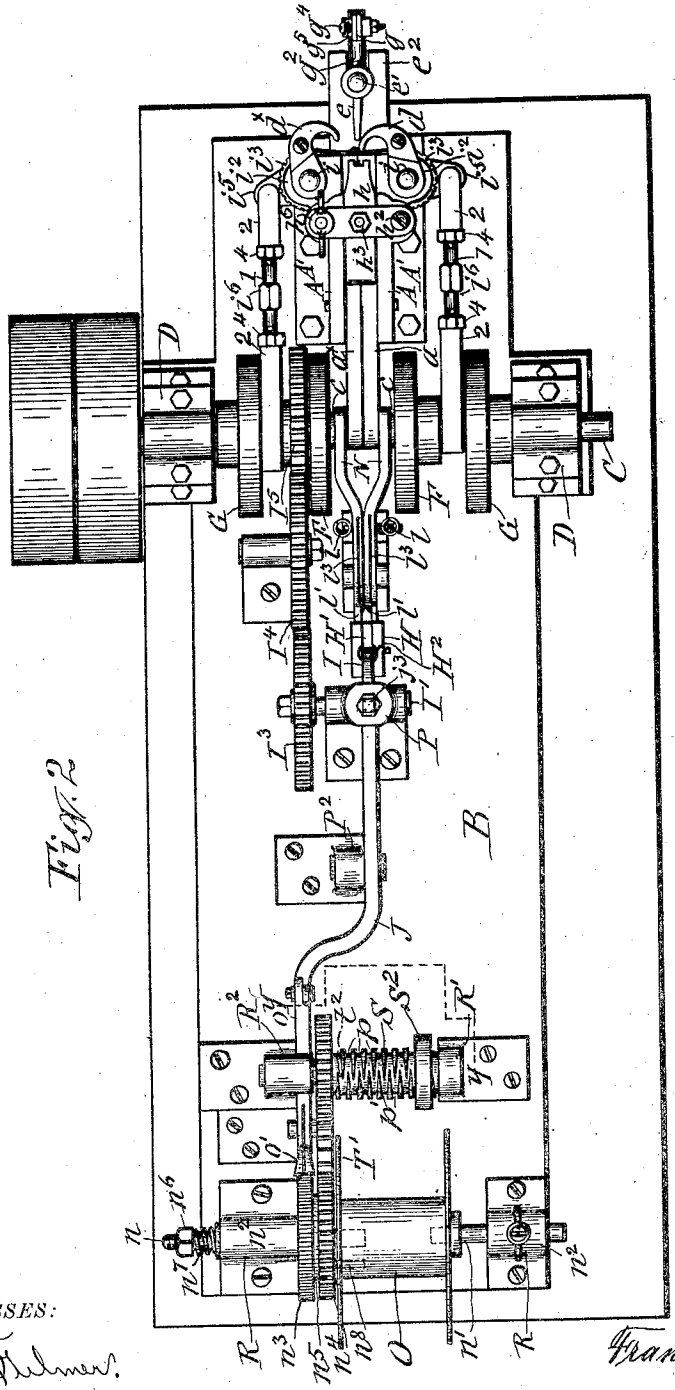


Fig. 2.

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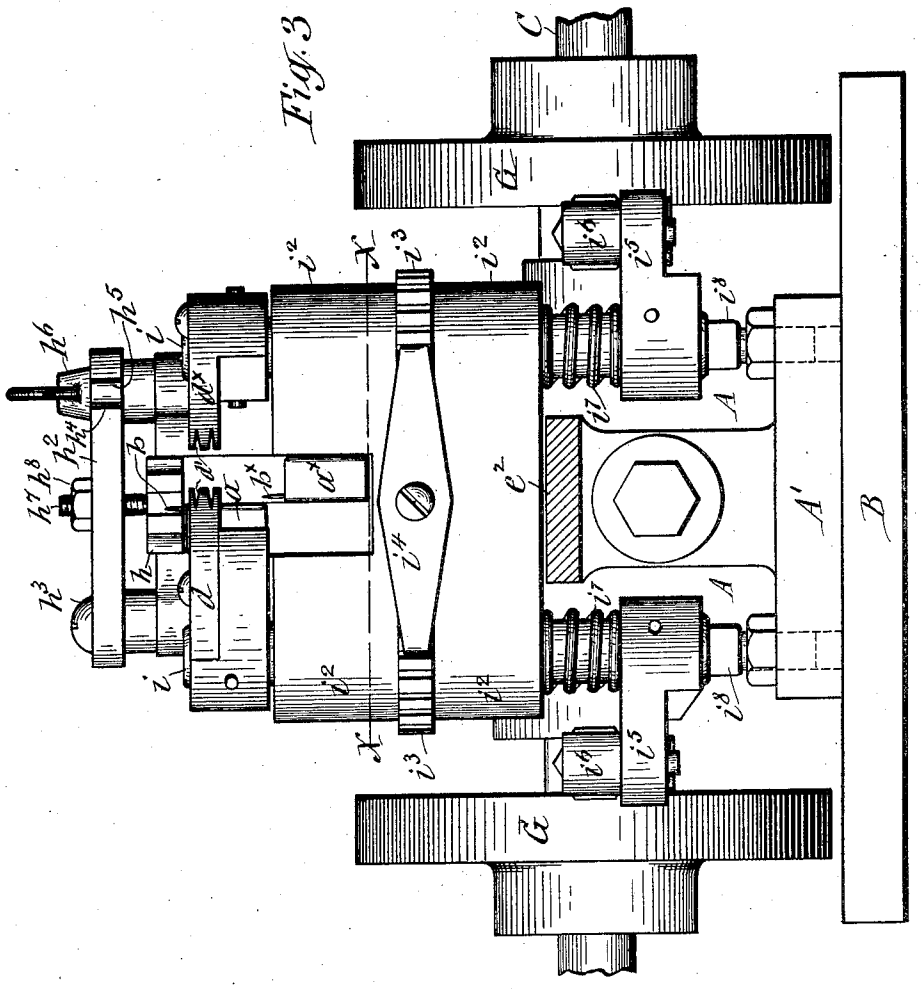
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7 SHEETS—SHEET 3.

Fig. 3



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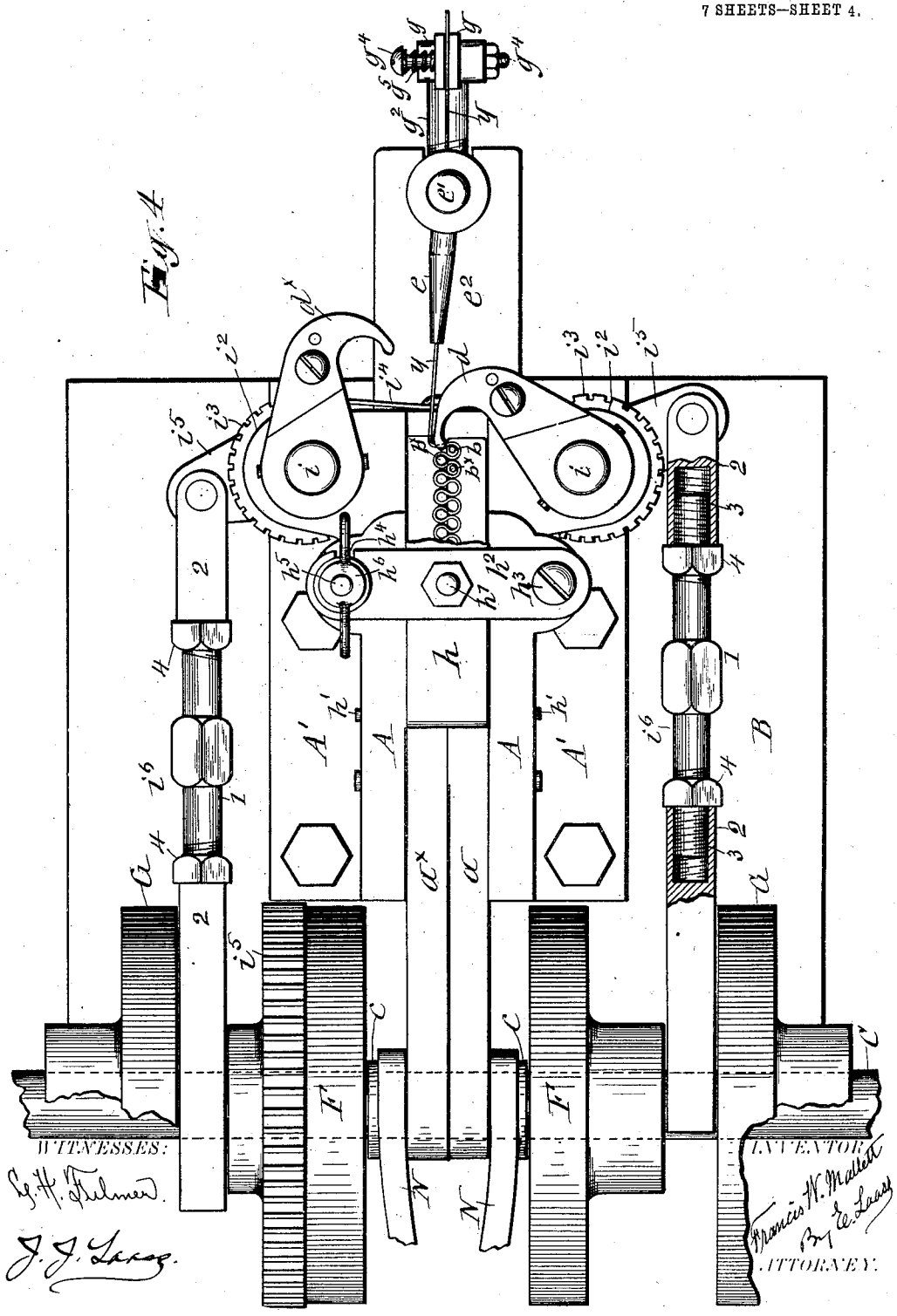
F. W. MALLETT.

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7 SHEETS—SHEET 4.

Fig. 4.



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7 SHEETS—SHEET 5.

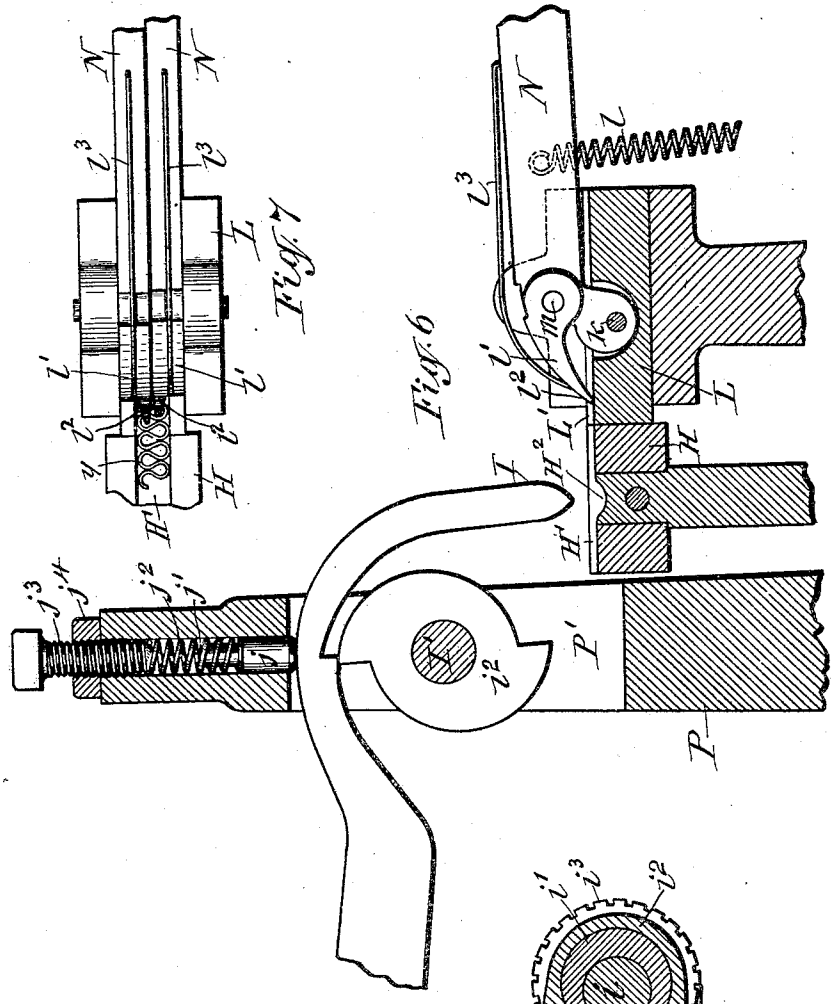


Fig. 4

Fig. 6

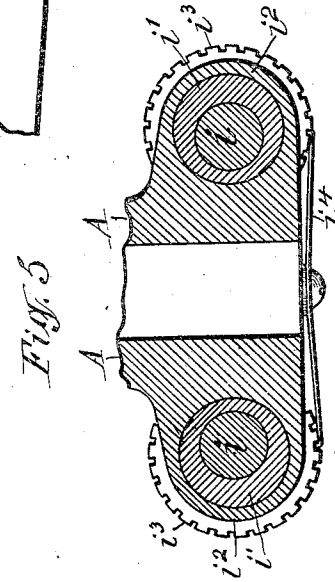


Fig. 5

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7 SHEETS—SHEET 6.

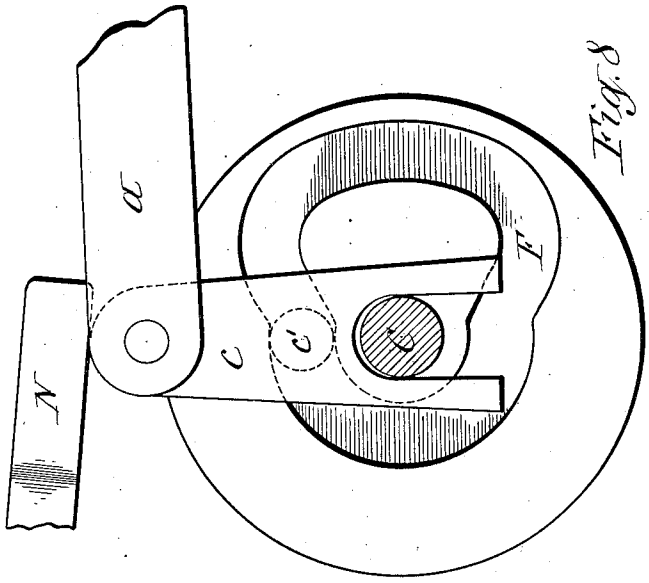


Fig. 8

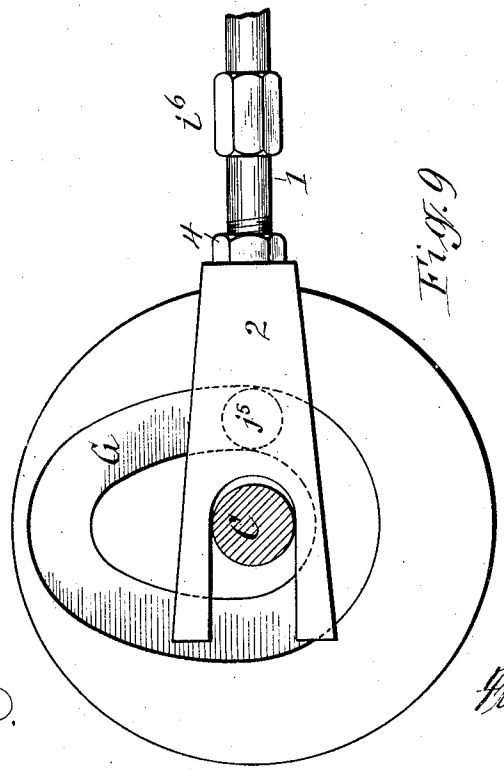


Fig. 9

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7 SHEETS—SHEET 7.

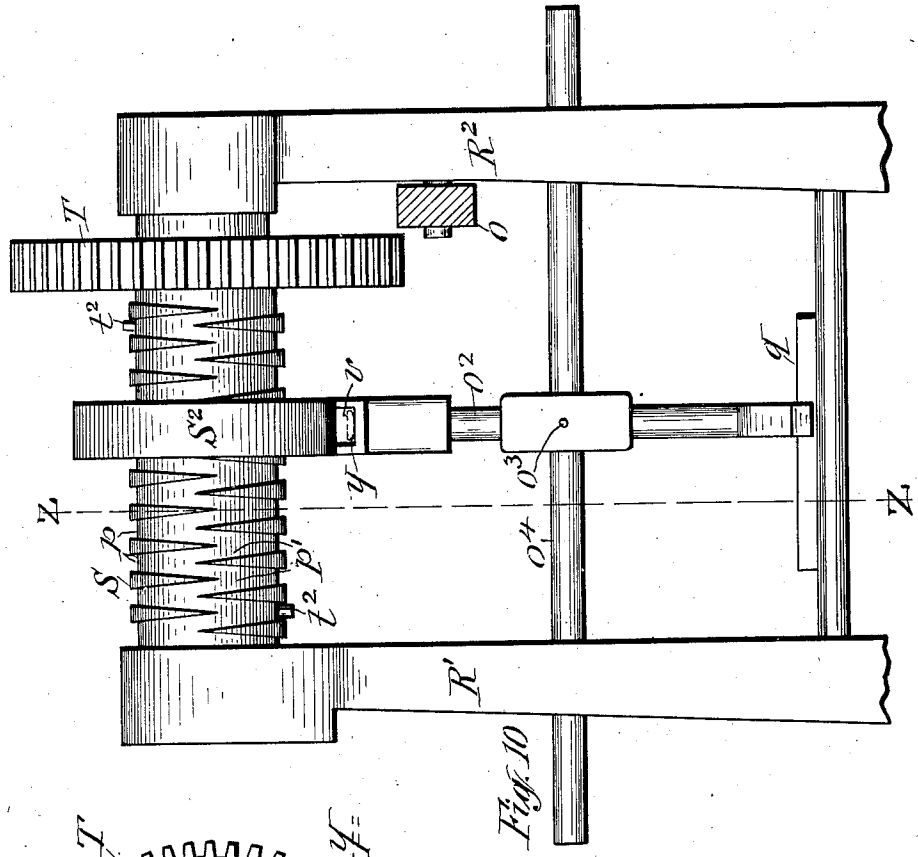


Fig. 10

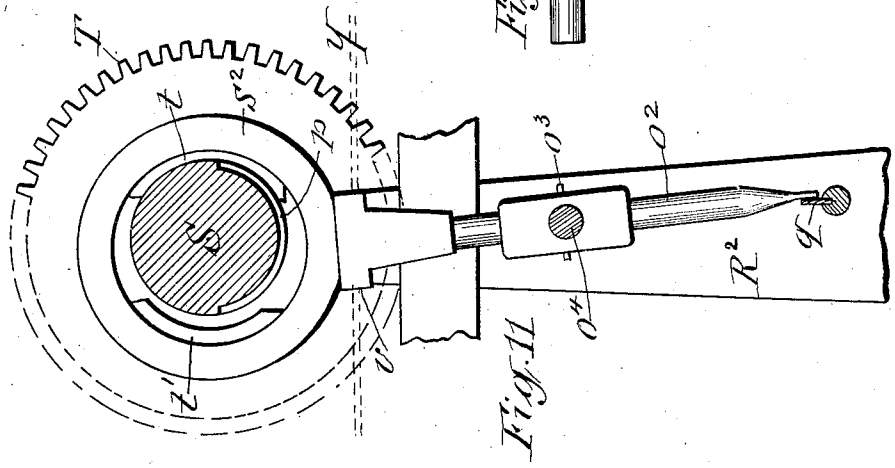


Fig. 11

WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANCIS WILLIAM MALLETT, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR TO THE SPIRELLA COMPANY, OF MEADVILLE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR FORMING METALLIC STAYS FOR GARMENTS.

No. 820,510. Specification of Letters Patent. Patented May 15, 1906.

Application filed July 6, 1905. Serial No. 268,382.

To all whom it may concern:

Be it known that I, FRANCIS WILLIAM MALLETT, of Meadville, in the county of Crawford, in the State of Pennsylvania, have invented new and useful Improvements in Machines for Forming Metallic Stays for Garments, &c., of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of machines which are designed to bend wire into serpentine shape, so as to produce therefrom a metallic band composed of a row of loops arranged contiguously side by side and alternately in reverse positions.

The present invention consists in an improved construction and combination of the actuating mechanisms of the wire-bending machine and auxiliary devices connected therewith and operating to produce improved results, as hereinafter explained and summed up in the claims.

The accompanying drawings illustrate the improved machine for bending wire into serpentine shape.

Figure 1 is a side elevation of said machine. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged front elevation of the machine omitting the feed-wire guide. Fig. 4 is an enlarged plan view of the front end portion of the machine. Fig. 5 is a transverse section on the line X X in Fig. 3. Fig. 6 is an enlarged vertical longitudinal section of that portion of the machine which is provided with the anvil and hammer for straightening the metallic garment-stay. Fig. 7 is a plan view of the push-bars which propel the said metallic garment-stay to the anvil. Figs. 8 and 9 are enlarged side views of one of the cams which actuate the wire-carrying bars and one of the cams which actuate the wire-bending fingers. Fig. 10 is an enlarged vertical transverse section on line Y Y in Fig. 2, and Fig. 11 is a vertical longitudinal section on line Z Z in Fig. 10.

Similar characters of reference indicate corresponding parts.

A A represent two parallel vertical walls formed with a base A′, which is bolted or otherwise rigidly secured to a stationary bed-plate B. Between the said walls are the wire-carrying bars a $a^{\times}$, which are pivoted at a' to the walls A A. The front end of each of these bars is provided with upwardly-projecting pins b $b^{\times}$, arranged one back of and at a short distance from the other. Said bars are oscillated alternately by means of the following mechanisms, to wit: Adjacent to the rear end of the bars a $a^{\times}$ is a rotary horizontal driving-shaft C, disposed at right angles to said bars and mounted in bearings on pedestals D D. To the driving-shaft C are attached two grooved cams F F, the grooves of which are shaped correspondingly, but in reversed positions. To the rear end of each of the bars a $a^{\times}$ is connected a depending arm c, the lower end of which is bifurcated and straddles the driving-shaft C, as shown in Fig. 8 of the drawings. To the side of the arm c is attached a stud c', which travels in the cam-groove F during the rotation of the cams. The arm c is thus reciprocated vertically and caused to impart oscillatory motion to the bar a.

The object of using the grooved cams is to dispense with the spring usually employed for maintaining in contact with the cam the part of the mechanism which is to receive motion therefrom.

d and $d^{\times}$ denote the alternately-oscillating wire-bending fingers which are disposed at opposite sides of the front ends of the two wire-carrying bars a and $a^{\times}$ and are curved so as to allow each of the said fingers to pass around the end of the bar adjacent thereto. The free end of each finger is provided with a groove or notch d', which is slightly below the plane of the top of the adjacent bar when in its raised position. I preferably provide the fingers d and $d^{\times}$ each with two notches d', arranged one below the other, as shown in Fig. 3 of the drawings, to allow said fingers to be reversed and used on either the right or left side of the bars a $a^{\times}$. The fingers d and $d^{\times}$ are oscillated alternately by mechanism hereinafter described and are timed in their action to correspond to the oscillation of the bars a $a^{\times}$, so as to cause each finger to swing around the end of the adjacent bar and back therefrom while said bar is in its raised position and the companion bar is depressed.

The operation of the machine thus far described is as follows: Referring to Fig. 3 and assuming the bar a to be in its raised position and the machine at rest, the operator inserts the end of the wire (indicated at y) longitudinally close to the outside of the front pin of

said bar. The machine being then set in motion causes the finger d to swing in across the end of the bar a and push the wire inward over the front pin b of the depressed bar $a^\times$, where it leaves the wire in the shape of a partly-formed loop, while the finger d swings back out of the way of the bar $a^\times$, which then rises and causes its front pin to enter into the said partly-formed loop. Then the bar a descends and releases the wire from the front pin of said bar. Then the finger $d^\times$ swings in and pushes the wire over the front pin of the depressed bar a, which then rises and causes its front pin to catch in the partly-formed loop of the wire over said bar. This completes the first loop on the bar a. The second loop is formed by the action of the finger d. In the release of the loop from the front pin b the wire is allowed to slip longitudinally and causes the released loop to be caught on the rear pin $b^\times$, and thus form the loops contiguously side by side and slightly overlapping. The continuation of the alternate action of the bars and fingers forms a metallic band composed of correspondingly-shaped loops disposed alternately in reversed positions. The notches d' of the fingers $d\ d^\times$ receiving the wire through them and being slightly below the top of the raised bar causes the fingers to bend the wire down across the inner edges of the bars, and thus produce a transverse convexity on the under side of the metallic band formed from the wire. This convexity partly stiffens the said band on one of its sides and increases the flexibility on the opposite side. This feature is especially desirable when the described metallic band is to be used for stays.

e represents a tubular guide which is pivotally supported on a post e', so as to allow said guide to yield laterally to the side thrust of the wire in being pushed alternately toward opposite sides by the fingers $d\ d^\times$. The guide e is rendered adjustable in its elevation by the post e', having its lower end screw-threaded and passing through a horizontal plate e^2, projecting from the front of the lower portion of the walls A A. By means of nuts f and f', applied to the post at the top and bottom of the plate e^2, said post may be raised or lowered and clamped in its desired position. Said adjustability of the guide e is desired to direct the delivery of the wire slightly below the plane of the elevated wire-carrying bar, as shown in Fig. 1, and to cause the wire to enter into the notch d' of the finger for the purpose of convexing the wire band, as hereinbefore described.

g denotes wire-tensioning plates, which are disposed side by side to receive between them the wire y, passing to the guide e, and are provided on the inner sides with friction-faces of either cloth or rubber or other suitable material by which they bear on the wire longitudinally. Adjustable screws g^4 pass through the plates g, and a spring g^5, interposed between the head of one of said screws and outer side of one of the plates, serves to apply the requisite pressure to said plates, as more clearly shown in Fig. 4 of the drawings. These tensioning-plates are supported on a post g', mounted on an arm g^2, projecting from a sleeve g^3, embracing the post e'. Said sleeve is provided with a screw-threaded perforation in its side, and into this perforation is screwed the arm g^2, the inner end of which engages the post e', and thereby fastens the sleeve on the post. By turning the arm g^2 so as to loosen it from the post e' the sleeve g^3 may be raised or lowered, and thus adjust the tension-plates g to bring different portions thereof in contact with the wire y.

h represents a plate disposed longitudinally over the bars a and $a^\times$ and pivoted at its rear end to the walls A A, as shown at h' in Fig. 1 of the drawings. Over the plate h is a transverse bar h^2, one end of which is pivotally connected at h^3 to the top of one of the walls A, and the opposite end of said bar is provided with a transverse slot h^4 through one side thereof and receives through said slot a stud-pin h^5, the upper end of which is screw-threaded and provided with a thumb-nut h^6, which bears on top of the bar, as shown in Figs. 1, 3, and 4 of the drawings. Centrally over the plate h the bar h^2 is provided with a screw-threaded vertical perforation through which passes a screw h^7, bearing on the top of the plate h and sustaining said plate a proper distance from the top of the bars a and $a^\times$ to allow the bent wire y to pass under the plate h and maintain said wire in a plane to allow the pins $b\ b^\times$ of the ascending wire-carrying bar to enter the previously-formed loops of the wire.

The wire-bending fingers $d\ d^\times$ receive their alternate oscillatory motion from the following mechanisms, to wit: Said fingers are attached to the upper ends of vertical shafts $i\ i$, which are journaled in eccentrics $i'\ i'$, pivoted in sleeves $i^2\ i^2$, formed on the front of the walls A A, as more clearly shown in Fig. 5 of the drawings. Said eccentrics are formed with annular plates i^3, which protrude through slots between the sleeves $i^2\ i^2$ and have their peripheries notched to afford the necessary hold for the operator to turn the eccentrics, and thereby adjust the shafts i of the wire-bending fingers a greater or less distance apart, and thus regulate the thrust of said fingers. A spring-plate i^4 is attached to the front of the walls A A and has its ends engaging the peripheries of the plate i^3, so as to prevent them from turning around, and thus to retain the shafts $i\ i$ in their adjusted position. The lower end of each shaft i rests on an adjustable bearing i^8 and has attached to it an arm i^5, to which is connected a longitudinally-adjustable reciprocating rod i^6. A spring i^7, surrounding the shaft i between the

arm i^5 and bottom of the lower sleeve i^2, serves to hold the said shaft down on the bearing i^8, which consists of the head of a screw inserted in a pocket in the base A', as indicated in dotted lines in Fig. 3 of the drawings. Said adjustment of the shafts i i is necessary to dispose the wire-bending fingers d $d^\times$ in the requisite plane in relation to the wire-carrying bars a $a^\times$. Grooved cams G G (shown in Fig. 9) of reversed contours are mounted on the driving-shaft C, on which the bifurcated rear ends of the rods i^6 ride. Rollers or studs j^5, projecting from the sides of the rods and engaging the cam-grooves G, impart alternate reciprocating motion to the said rods. To allow the thrusts of the fingers d $d^\times$ to be regulated to properly coöperate with the pins b $b^\times$ of the bars a and $a^\times$, the rods i^6 are each formed of a central section 1, which is provided with right and left threads at opposite ends and screwed into corresponding sockets 3 3 in the end sections 2 2 of the rod. By means of nuts 4 4 the rod is retained in its adjustment.

The hereinbefore-described operation of forming the wire band and convexing it on one side imparts to the said band a tendency to curl or twist longitudinally, so as to hinder its being properly wound upon a reel. This difficulty is overcome by passing the said wire band onto a suitable anvil and subjecting it to the blows of the hammer. The detail construction of said anvil and hammer is susceptible of various modifications which will readily suggest themselves to a mechanic conversant with the use of tools of that character. The accompanying drawings illustrate the preferred construction, in which H represents the anvil, which is in range with the bars a $a^\times$ and is provided with a longitudinal groove H' in its top and a depression H^2 in said groove, as shown in Fig. 6 of the drawings. At the rear of the anvil is a post P, which is provided with a vertical slot P', through which passes a rearward extension of the hammer I, which is pivoted to a post P^2. Through the slotted portion of the post P extends a transverse shaft I', on which is mounted a suitable cam I^2, which is under the hammer. The shaft I' has attached to it a gear I^3, which receives rotary motion from the driving-shaft C by a train of gears I^4 I^5. The cam I^2 is thus rotated and caused to intermittently lift the hammer. Over the hammer is located a plunger j, which is guided in a vertical channel j', extending through the top of the post P and screw-threaded in its upper end portion. The top of the plunger bears a spring j^2, which is compressed endwise by a screw j^3, inserted in the upper end of the channel j'. Said screw can be adjusted to apply the desired pressure on the plunger and obtain the desired force of the stroke of the hammer. A jam-nut j^4, applied to the screw j^3, retains it in its adjustment. The looped wire y, passing longitudinally through the groove H' of the anvil H and subjected to the strokes of the hammer I, straightens the wire longitudinally.

To facilitate the movement of the wire to the anvil, suitable push-bars are employed to engage the wire and propel the same. The preferred construction of said push-bars is illustrated in Figs. 6 and 7 of the drawings, in which a block L is disposed in front of the anvil and provided with a longitudinal guide-groove L', which is in line with the groove H' of the anvil and receives the wire through it. To the said block are pivoted the rear ends of the bars N N, as shown at k. The front ends of said bars are directly over the arms c c, which are reciprocated vertically, as hereinbefore described. Said movement of the arms c c imparts oscillatory motion to the bars N N, which, by means of springs l l, are drawn down to maintain them in contact with the arms c c. To each of the bars N is pivoted at m a dog l', which is provided on its rear end with a pointed toe l^2, by which it engages the loop of the wire in transit through the groove L'. A spring-finger l^3 is attached at its front end to the bar N and bears with its rear end on top of the dog to insure its engagement with the wire. The oscillations of the bars N cause the dogs l' to alternately push the wire toward the anvil.

O represents a reel upon which is wound the looped wire passing from the anvil. Said reel is pivotally supported at its ends on two mandrels n n', mounted in bearings n^2 on the standards R R. On the mandrel n is loosely mounted a ratchet-wheel n^3, which abuts against the inner end of the bearing n^2. Near to the inner side of said wheel is a gear-wheel n^4, fastened to the mandrel, and between the said two wheels is interposed a disk n^5 of suitable material to transmit motion by frictional contact with said wheels.

The mandrel n is extended beyond the outer end of the bearing n^2 and has its protruding end screw-threaded and provided with a nut n^6. A spiral spring n^7 embraces the mandrel between the nut and outer face of the bearing n^2, and by pressing on said parts it forces the mandrel endwise, and thus causes the side of the gear-wheel to press on the disk n^5, which by frictional contact transmits rotary motion from the ratchet-wheel to the gear-wheel. A stud-pin n^8 projects from the inner face of the wheel n^4 and engages a socket in the head of the reel, and thus imparts rotary motion to the reel. The ratchet-wheel n^3 receives rotary motion from a lever o, fulcrumed intermediate its ends on a post R' and pivotally connected at front end to a rear extension J of the arm of the hammer I. The opposite end of the lever o is provided with a dog o', which engages the ratchet-wheel n^3. In order to wind the looped-wire band properly and

evenly upon the reel *o*, a suitable guide is employed to travel back and forth in a line parallel with the axis of the reel and carry the said wire band in transit to the reel. The construction of the said guide and mechanisms used in connection therewith admits of many variations. The construction shown in Figs. 1 and 2 of the drawings consists of a roller S, disposed in front of and parallel with the axis of the reel and mounted in bearings on standards R′ R², secured to the bed-plate B. Said roller is provided with right and left or crossing grooves *p p′* and is surrounded by a ring S², from which depends a stem *o²*, which is fastened intermediate its ends, as shown at *o³*, to a horizontal bar *o⁴*, sliding longitudinally in bearings *o⁵* in the standards R′ R². Beneath the bar *o⁴* and parallel therewith is a track *q*, on the side of which bears the lower end of the stem *o²*. On opposite sides of the interior of the ring S² are tongues *t t′*, which are inclined in opposite directions corresponding to the inclinations of the right and left grooves *p p′*. The inner circumference of the ring S² is sufficiently greater than the roller S to allow said ring to move toward and from opposite sides of the roller and cause the tongue *t t′* to alternately engage the right and left grooves *p p′*. To the roller S is attached a gear T, which receives rotary motion from an intermediate gear T′, meshing with the gear *n⁴* on the mandrel *n* of the reel, as shown in Figs. 1 and 2 of the drawings. At each end of the roller S is a lug *t²*, set in one of the grooves *p p′*, which serves to pry the engaged tongue out of the groove, and thereby cast the ring S² in a direction which causes the other tongue to engage the coinciding groove, and thus compel the ring S² to move to the opposite end of the roller. It will thus be observed that the movement of the ring S² is automatically reversed at each of its arrivals at the ends of the roller. The thrust of said ring toward opposite sides of the roller causes the lower end of the stem *o²* to be thrown from one side of the track *q* to the opposite side thereof and caused to engage said side, and thereby maintain the ring in position to hold the tongue in the groove of the roller.

v denotes a guide which is carried on the exterior of the ring S² and leads the wire band *y* to the reel O, upon which it is to be wound.

What I claim as my invention is—

1. In combination with the alternately-oscillating wire-carrying bars, vertical shafts at opposite sides of said bars and adjustable in their distances from the same, wire-bending fingers attached to said shafts, and mechanisms imparting alternate oscillatory motion to the shafts as set forth.

2. In combination with the alternately-oscillating wire-carrying bars, pivotally-supported eccentrics at opposite sides of said bars, means for locking said eccentrics adjustably in position, shafts pivoted in the eccentrics, wire-bending fingers attached to said shafts, and mechanism imparting alternate oscillatory motion to the shafts as set forth.

3. In combination with the pivotally-supported wire-carrying bars, wire-bending fingers disposed at opposite sides of said bars, and means imparting alternate oscillatory motion to said fingers, a rotary horizontal shaft disposed at right angles to the wire-carrying bars, grooved cams attached to said shaft and reversed in their contours, arms pivoted to the said bars and engaging said cams to impart alternate oscillating motion to said bars as set forth.

4. In combination with the alternately-oscillating wire-carrying bars, vertical shafts at opposite sides of said bars, wire-bending fingers attached to said shafts, a rotary horizontal shaft disposed at right angles to the aforesaid bars, reversely-disposed grooved cams attached to said horizontal shaft, arms attached to the vertical shafts, and rods connected to said arms and receiving reciprocating motion from the grooved cams as set forth.

5. In combination with the pivotally-supported wire-carrying bars, vertical shafts at opposite sides of said bars, wire-bending fingers attached to said shafts, a rotary horizontal shaft disposed at right angles to the wire-carrying bars, two sets of grooved cams attached to said horizontal shaft, the contours of the cams of each set being reversed to each other, arms connected to the wire-carrying bars and receiving reciprocating motion from one set of said cams, arms attached to the vertical shafts, and rods connected to said arms and receiving reciprocating motion from the other set of cams as set forth and shown.

6. In combination with the alternately-oscillating wire-carrying bars, vertical shafts at opposite sides of said bars, and provided with laterally-projecting arms, and wire-bending fingers attached to said shafts, a rotary horizontal shaft disposed at right angles to the aforesaid bars, grooved cams of reversed contours attached to said horizontal shaft, and rods transmitting motion from said cams to the arms of the vertical shafts and each of said rods composed of two end sections provided with sockets and intermediate sections having right and left threaded ends screwed adjustably into the aforesaid sockets to adjust the length of the rod as set forth.

7. The combination with the wire-carrying bars, and alternately-oscillating wire-bending fingers, of a wire-guide leading to said bars and pivoted to swing laterally within limits of the sweeps of said fingers as set forth.

8. In combination with the wire-carrying bars and alternately-oscillating wire-bending fingers, a wire-guide leading to said bars and

supported yieldingly to the thrust of the wire, tensioning-plates disposed at opposite sides of the path of the wire to said guide, and means for adjustably pressing said plates into contact with the wire as set forth.

9. The combination with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and in line therewith to receive the bent wire, a hammer over said anvil, and mechanisms actuating said hammer to successively strike the said bent wire in transit on the anvil.

10. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and in range herewith to receive the bent wire, a guide leading said wire to the anvil, a hammer over said anvil, and mechanisms actuating said hammer to successively strike the wire in transit on the anvil.

11. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and provided with a longitudinal wire-receiving groove in its top and with a depression in said groove, a hammer over said depression, and mechanisms actuating said hammer to successively strike the wire in transit as set forth.

12. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and provided with a longitudinal groove in its top, push-bars forcing the bent wire into said groove, mechanisms actuating said push-bars, a hammer over the groove of the anvil and mechanisms actuating said hammer.

13. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and provided with a longitudinal groove in its top, a block formed with a guide-groove leading the bent wire to the groove of the anvil, levers pivoted to said block, wire-pushing dogs pivoted to said levers and riding in the guide-groove of the block, springs depressing said dogs, mechanisms imparting oscillatory motion to said levers, a hammer over the groove of the anvil, and mechanisms actuating said hammer.

14. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond the said bars and in range therewith, a hammer over said anvil, a spring depressing the hammer, and a rotary cam lifting the hammer as set forth.

15. The combination, with the wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and in range therewith, a hammer over the anvil and pivoted beyond the same, a post between the anvil and the pivot of the hammer and provided with a vertical guide-slot receiving the hammer through it, a horizontal shaft extending through said slot under the hammer and journaled in the post, a hammer-lifting cam-wheel attached to said shaft within the slot of the post, a spring supported in the post and bearing on the top of the hammer, a screw connected to the post and pressing on the top of the spring, and mechanisms transmitting rotary motion to the aforesaid shaft as set forth.

16. The combination, with the pivoted wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and in range therewith, a hammer over said anvil and actuated to successively strike the bent wire in transit, a block interposed between the anvil and aforesaid bars and provided with a guide-groove leading to the anvil, wire-pushing levers pivoted to the interposed block, a rotary horizontal shaft disposed at right angles to the wire-carrying bars, cams of reverse contours mounted on said shaft and imparting oscillatory motion to said bars and to the wire-pushing levers.

17. The combination, with the pivoted wire-carrying bars and wire-bending fingers, of an anvil located beyond said bars and in range therewith, a hammer over said anvil and pivoted beyond the same, a post between the anvil and the pivot of the hammer and provided with a vertical guide-slot receiving the hammer through it, a horizontal shaft extending through said slot and journaled in the post, a hammer-lifting cam-wheel attached to said shaft a block interposed between the anvil and the wire-carrying bars and provided with a guide-groove leading to the anvil, wire-pushing levers pivoted to the interposed block, a rotary horizontal shaft disposed at right angles to the wire-carrying bars, cams of reverse contours mounted on said shaft and imparting oscillatory motion to said bars and to the wire-pushing levers, and a train of gears transmitting motion from said shaft to the shaft of the hammer-lifting cam-wheel as set forth and shown.

18. In combination with the wire-carrying bars, wire-bending fingers, wire-band-straightening hammer, the driving-shaft and mechanisms transmitting motion from said shaft to the aforesaid parts, a reel mounted on mandrels, a wheel fastened to one of said mandrels and provided with means for imparting rotary motion to the reel, a ratchet-wheel mounted loosely on said mandrel, a friction-disk interposed between said wheels, and a lever actuated by the oscillations of the hammer and imparting rotary motion to the aforesaid ratchet-wheel as set forth.

19. In combination with the alternately-oscillating wire-carrying bars provided with upwardly-projecting pins on their front end, the wire-bending fingers movable across the ends of said bars and provided with wire-engaging notches lower than the top of the bar in raised position to bend the wire partly down on the top edge of the bar as and for the purpose set forth.

20. In combinaion with the wire-carrying bars and oscillatory wire-bending fingers, a laterally-yielding wire-feed guide leading the wire to the path traversed by the aforesaid fingers.

21. In combination with the wire-carrying bars and oscillatory wire-bending fingers, a laterally-yielding wire-feed guide supported adjustably in elevation and leading the wire to the path traversed by said fingers.

22. In combination with the wire-carrying bars and oscillatory wire-bending fingers, a post supported adjustably in elevation, and a wire-feed guide pivotally supported on said post.

23. In combination with the wire-carrying bars and wire-bending fingers, a post supported adjustably in elevation, a wire-feed guide pivotally supported on said post, a sleeve embracing the post and provided with a screw-threaded perforation in its side, an arm screwed into said perforation and engaging the post, a post secured to the free end of the arm, and wire-tensioning plates attached to the latter post as set forth.

24. In combination with the reel, a roller parallel with the said reel and provided with right and left grooves in its periphery, a ring surrounding said roller and movable toward and from the same, tongues in opposite sides of the interior of the ring and inclined corresponding to the aforesaid grooves, means for shifting the ring toward and from the roller at opposite ends thereof, a guide on the aforesaid ring carrying the wire band toward the reel, and means for transmitting motion to the aforesaid roller.

25. In combination with the reel, a roller parallel with said reel and provided with right and left grooves in its periphery, a ring surrounding said roller and movable toward and from the same, tongues in opposite sides of the interior of said ring and inclined corresponding to the aforesaid grooves, a lug in each of the grooves and disposed at opposite ends of the roller to throw the ring alternately toward and from the roller, a track parallel with the roller, a stem extending from the ring and disposed to engage the track alternately at opposite sides, a guide on the ring carrying the wire band toward the reel, and means for transmitting motion from the reel to the roller as set forth.

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Witnesses:
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