

J. Copley Jr.

Making Chains.

N^o 68,709.

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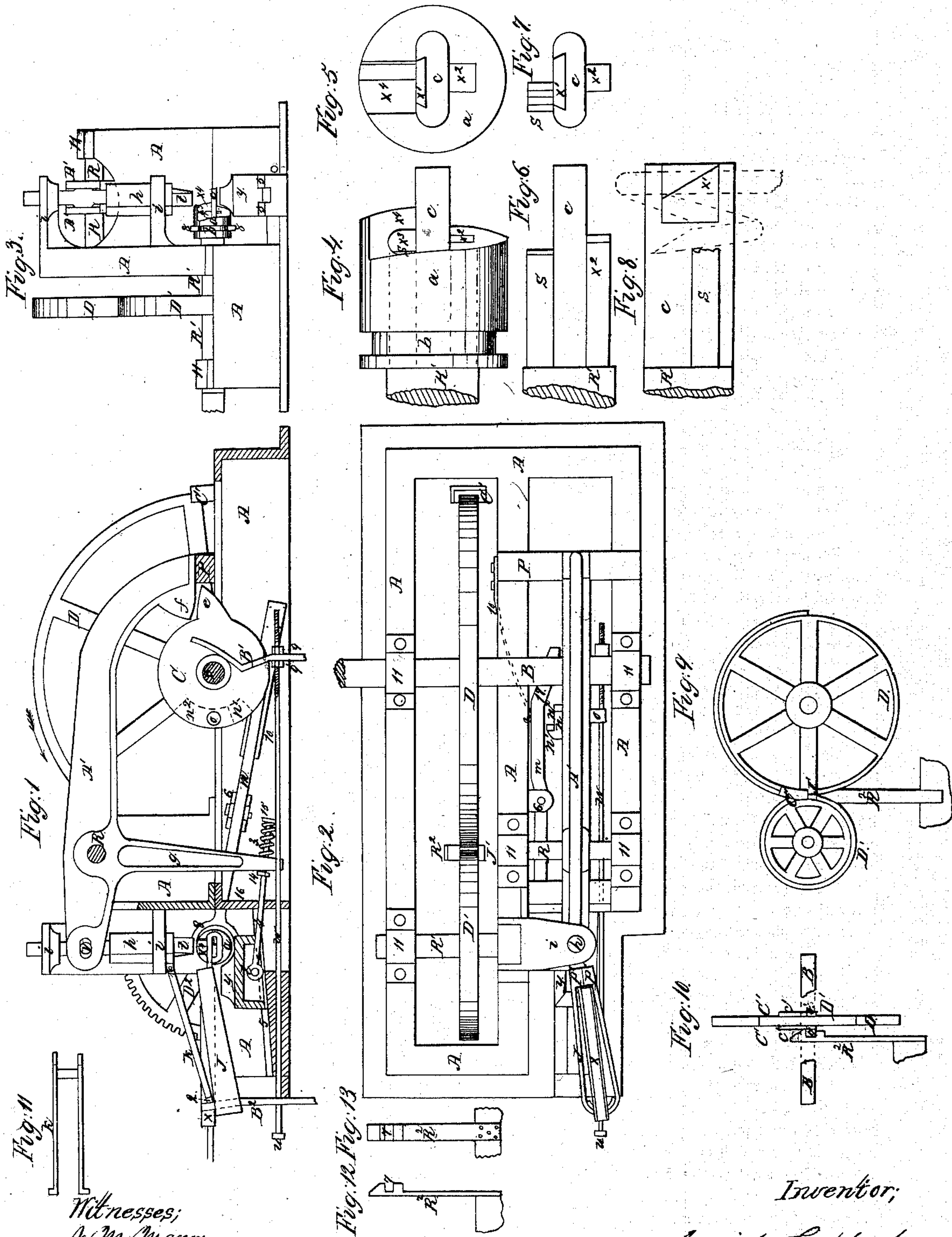


Fig. 11.

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IMPROVEMENT IN MACHINES FOR MAKING CHAINS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSIAH COPLEY, Jr., of Allegheny City, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Chain Machines; and I do hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, and the letters and figures of reference marked thereon.

My invention consists in so constructing a machine for forming links for chains that it will grasp the iron when supplied to it, form the link, cut the scarf, and give the desired overlap for welding, and continue to feed up the iron until it is entirely expended in forming links, said machine being constructed, arranged, and operating substantially in the manner hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation. In the accompanying drawings, which form part of my specification—

Figure 1 represents a side elevation of my improved chain machine, with a portion of the frame removed.

Figure 2 is a top view or plan of the machine.

Figure 3 represents an end view of the same.

Figure 4 is a side view of the collar and mandrel used for forming the links.

Figure 5 is an end view of the same.

Figure 6 is a side or edge view of the mandrel around which the link is formed.

Figure 7 is an end view of the mandrel.

Figure 8 is a top or face view of the mandrel.

Figure 9 represents in outline a side view of the gear-wheels.

Figure 10 represents a face or front view of the gear-wheels, and a latch used for the purpose of holding the wheel D' and its shaft, and the mandrel connected with it, in a fixed position until the link is cut off and removed from the mandrel and the iron fed up to form the next link.

Figure 11 represents a piece used for moving the spring-clamp back on the iron, for the purpose of obtaining the desired overlap for welding.

Figure 12 represents a side view of the spring-latch used for holding the wheel D' in the desired position.

Figure 13 represents a face view of said spring-latch.

In the drawings, A represents the frame of the machine, which may be made of iron or wood, and may be secured down on any suitable base. B represents the main shaft, which is provided with a driving-wheel, D, and disk C. The driving-wheel D is provided with cogs on only part of its periphery, said cogs being sufficient in number to turn the wheel D' one full revolution. A portion of the cogs of wheel D is provided with shrouds C', which are used in connection with a piece, J', on the wheel D', for bringing into proper gear the wheels D and D', and also for the purpose of preventing the cogs from knocking and jamming against each other while coming into gear. The piece marked J' is put in place of one of the cogs of the wheel D', and extends out beyond the ends of the cogs nearly to the thickness of the shrouds C' on the wheel D.

The disk C on the shaft B is provided with a lifter, e, for operating the cutter-lever A', a pin, o, for operating the spring B', and a projection, n, for imparting the desired motions to the clutch-lever m. The cutter-lever A' is secured on shaft R, and is provided with a lifting-point, f, and an arm, g, for operating the support y for the mandrel c upon which the link is formed. The support y moves on an inclined way, marked 5, and is operated by the arm g, through the medium of the rod 4, which is pivoted and attached to the support y at the point marked l, and is provided with collars 14 and 15 and a spiral spring, 8. The cutter-holder or stock h moves in guides i, and is provided with two trunnions V, which work in suitable slots made in the end of the cutter-holder A'. The cutter t is secured in its holder h by means of a set-screw or other device, and may be adjusted so that it will cut the scarf of the link at any desired angle.

The mandrel c, around which the link is formed, may be part of the shaft R', or it may be made in a separate piece, and secured to the shaft by any suitable means. The upper side of the mandrel c is provided with a rib, marked s, the front end of which is furnished with teeth. In the upper side of the mandrel is made a recess, into which is inserted a steel plate, x', the front end of which must in form correspond to the angle of the cutting edge of the cutter t. The form of and manner of securing the steel plate x' in the mandrel are clearly shown in figs. 7 and 8. On the under side of the mandrel c is a rib or brace, x'', which is used for the purpose of supporting and giving strength to the mandrel.

On the mandrel is placed a collar marked a, which is provided with a helical-formed end, a recess, x'', and a groove marked b, in which the clutch 8 of the lever m works. The recess x'' is used for receiving the end of the rod from which the links are formed; and the key S, in connection with the lip x' of the collar, is used for grasping the end of the rod, which grasping of the rod, and the releasing of it from the grasp of the key and lip x' of the collar, is effected by moving the collar longitudinally on the mandrel, through the medium of the

clutch-lever *m* and the projection *n'* on the disk C. The rod *w* passes through openings in the spring B² and B¹, and is adjusted and secured to the spring B¹ by means of screw-nuts 9. One end of the rod *w* is provided with a head or collar, *u*, which is used for the purpose of drawing forward the spring B², to which is attached the spring-clamp J, which is provided with jaws P', the inner faces of which are grooved out, so that they will grasp around the rod from which the links are formed, and hold it sufficiently firm to cause it to wrap closely around the mandrel in the process of forming the link.

On the upper end of the spring B², just above the spring-clamp J, is secured a U-shaped feed-guide marked *x*. To the stock or cutter-holder *h* is attached and pivoted the piece marked *k*, which is made in the form represented in fig. 11. This piece *k* straddles the feed-guide *x*, the parts marked 2 resting on the spring-clamp, and so arranged that they will press against that part of the spring B² which is secured to the sides of the U-shaped feed-guide *x*, and is of such a length as will allow the spring-clamp J to properly feed up the iron of which the links are formed, and is set at such an angle, with relation to the stock *h*, that the downward motion of the stock will cause the piece *k* to press back against the spring B², and thereby cause the feed-guide *x* and spring-clamp J to slip back on the rod which forms the link a sufficient distance to give the desired overlap for welding.

The form, size, and arrangement of the several parts herein described may be varied, and the same general result obtained; therefore I wish it clearly understood that I do not confine myself to any one form, size, or arrangement of the parts, but leave this to the taste, skill, and judgment of the mechanic. As the construction and arrangement of the parts, and the relation that these parts bear to each other will readily be understood by the skillful mechanic from the description above given, and by reference to the accompanying drawing, I will therefore, without further description, proceed to describe the operation of my improvement in chain machines.

When it is necessary (which will always be the case in making heavy links) the iron is heated in suitable furnace. It is then placed in the feed-guide *x*, and in between the jaws P' sufficiently for the feed device to bring it into the recess *x*³ of the collar *a*; and as the shaft B, wheel D, and disk C revolve, the pin *o* will come in contact with the spring B¹, which draws back the rod *w*, and the head *u* of the rod *w* pressing against the spring B², will carry forward the spring-clamp J and feed-guide *x*, which will thrust the projecting end of the iron into the recess *x*³ of collar *a*, which is held out toward the end of the mandrel *c*, by means of the clutch-lever *m*, acted upon by the elevation *n*² of the projection *n* on the disk C. The projection *n* having passed beyond the end of the lever *m*, the spring 10, pressing it toward the disk C, causes it to move the collar *a*, so that lip *x*⁴, pressing the iron against the end of the rib *s*, holds it fast. Then the shroud *c'* on wheel D, striking against bevel face of the latch R², presses it back, releasing the cross-piece J' on wheel D', which is then set in motion by shroud C' acting on the cross-piece J', which motion is continued until it, together with the mandrel, has made one full revolution, wrapping the iron around the mandrel, the helical face of the collar *a* guiding it and giving it the desired form of an open link. The lifter *e* on disk C, acting on the point *f* of the cutter-lever A', causes the cutter-stock *h* to descend, which will cause the piece *k* to press back the spring B², together with the spring-clamp J, slipping the jaws P' of said clamp back on the iron sufficiently to give the desired overlap for the next link. At the same time the support *y* is drawn up under the end of the mandrel *c*, by the arm *g* pressing against the spring 3 on the connecting-rod 4. The motion of the support being checked by the web 16 of the frame A, the spring 3 yields to the further motion of the arm *g*. The descent of the cutter-stock *h* causes the cutter *t*, which, in connection with the steel plate *x*¹ in the mandrel, forms a pair of shears to cut off the iron, leaving the iron with a scarf corresponding with the angle at which the cutter is set. The link being cut off, the remaining iron in the spring-clamp J will be carried back by the action of the spring B². At the same time cutter-lever A' falls back to its original position on the cross-piece P, raising the cutter and its stock, and drawing back the piece *k*, and, by means of the arm *g* and rod 4, pushing back the support *y* from beneath the mandrel. The bevel face *n*¹ of the projection *n* on the disk C, pressing against incline 17 of lever *m*, moves the collar *a* outward, causing the collar to push the link off the mandrel. The end of lever *m* then drops down on the elevation *n*² of the projection *n*, carrying the collar *a* back to the proper position for receiving the iron into the recess *x*³ for the next link.

Having thus described the nature, construction, and operation of my improvement, what I claim as of my invention, is—

An improved machine for forming links for chains, that shall grasp the iron supplied to it, form the link, cut the scarf, and give the desired overlap for welding, and continue to feed up the iron until it is entirely expended in forming links, constructed, arranged, and operating substantially in the manner herein described and set forth.

Also, the combination of the collar *a*, mandrel *c*, and rib *s*, constructed, arranged, and operating substantially as herein described and for the purpose set forth.

Also, the support *y*, or its equivalent, when used for supporting the mandrel, operated by means and in the manner substantially as herein described and set forth.

Also, the combination and arrangement of the springs B¹ and B², rod *w*, spring-clamp J, feed-guide *x*, and piece *k*, constructed, arranged, combined, and operating substantially in the manner herein described, and for the purpose set forth.

Also, the combination of the shrouds C', cross-piece J', and latch R², when used in connection with the wheels D and D', as herein described, and for the purpose set forth.

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