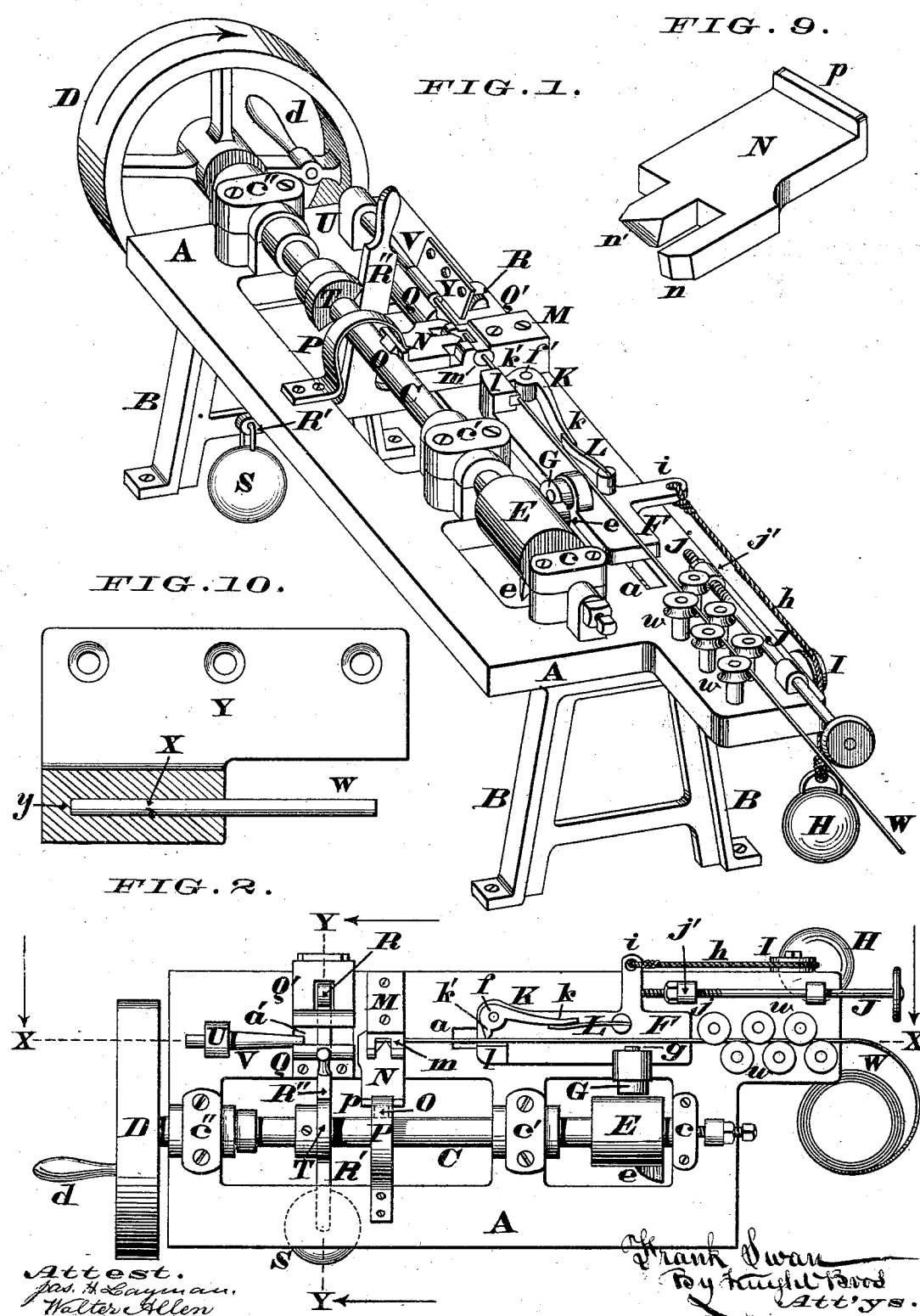


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Machines for Inserting the Pintle in Butt-Hinges.
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FIG. 3.

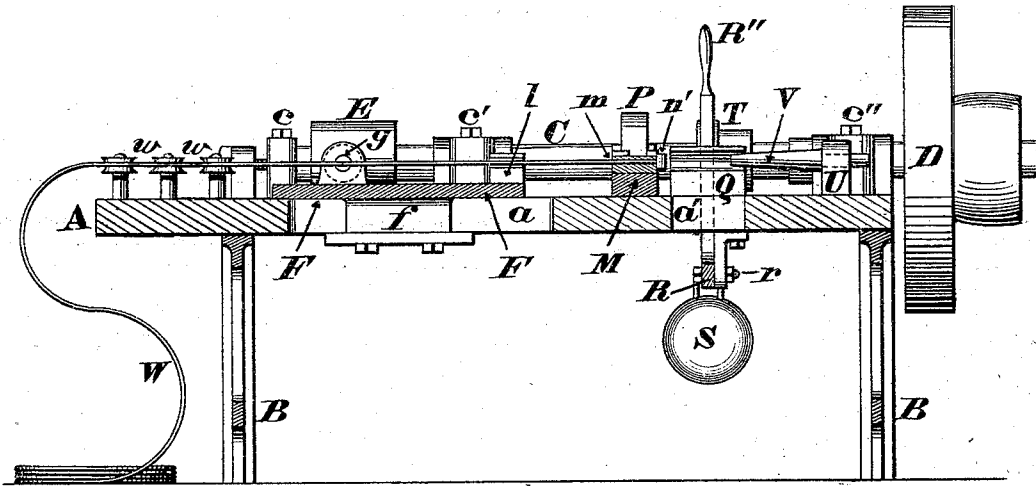


FIG. 4.

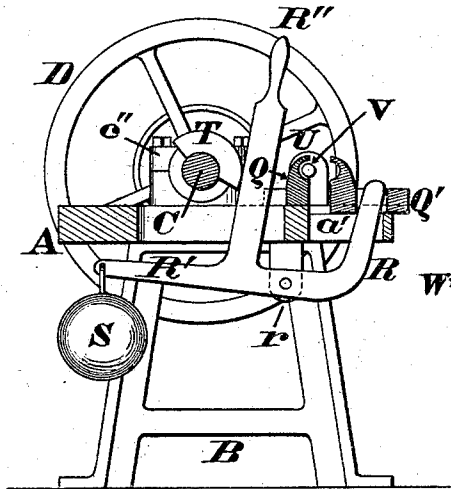


FIG. 5.

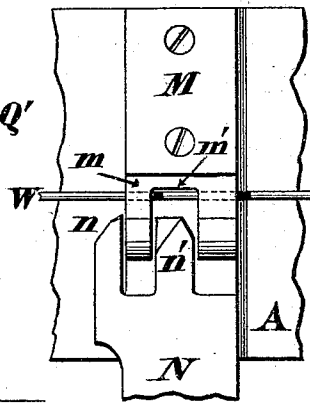


FIG. 6.

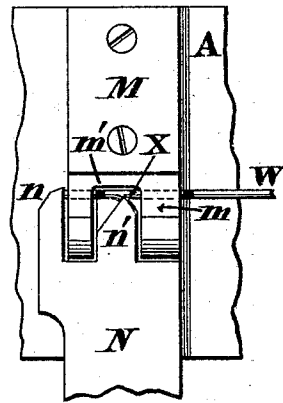


FIG. 7.

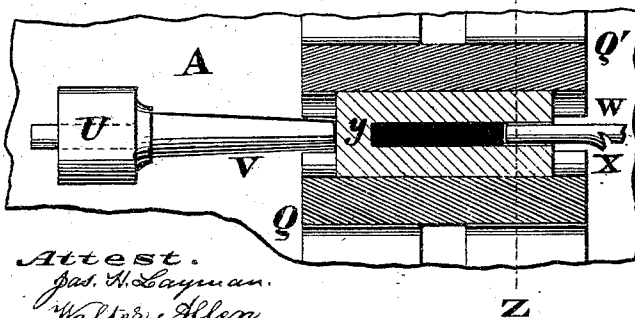
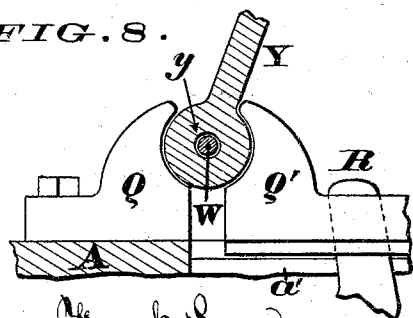


FIG. 8.



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FRANK SWAN, OF JOLIET, ILLINOIS.

IMPROVEMENT IN MACHINES FOR INSERTING THE PINTLES IN BUTT-HINGES.

Specification forming part of Letters Patent No. **148,001**, dated February 24, 1874; application filed January 9, 1874.

To all whom it may concern:

Be it known that I, FRANK SWAN, of Joliet, Will county, Illinois, have invented a new and useful Improvement in Machines for the Manufacture of Butt-Hinges, of which the following is a specification:

The object of my invention is to apply the wrought-iron pivot or pintle to the lower half of those butt-hinges which consist of two separable members in a much more rapid, secure, and economical manner than has heretofore been done. To accomplish this result I make use of a coil of wire of suitable diameter, or else of a long round bar or rod of iron, which wire or bar is, by proper appliances, automatically forced into the pintle-socket of one of the leaves, plates, or like member of one of the hinges; after which said wire or rod is severed by a cutter or bit which is brought into action at regular intervals. In order that the pintle may be retained in its proper position within the butt-socket, a small and outwardly-projecting spur, barb, or fin is formed on one side of the wire by the action of a suitable chisel, which is automatically advanced by a cam on the driving-shaft of the machine, and afterward retracted by a spring. This barb or fin projects in such a direction as to offer no opposition to the entrance of the wire into the appropriate socket in the butt, while at the same time it effectually prevents any withdrawal of the pintle, as hereinafter more fully explained. It is evident that the butt must be clamped within suitable jaws and held securely in position until the wire has been nicked or barbed, inserted, and severed; after which the jaws are opened, the butt removed, and another one inserted in its place, so as to render the operation a continuous one. The butt, after being removed from the retaining-clamp, has projecting from it a wire pivot or pintle of suitable length for insertion in the other leaf of the hinge, which latter operation is accomplished by hand.

Having thus briefly described the main feature of my invention, I will now proceed to give a detailed explanation of one of a number of machines that may be advantageously employed for accomplishing said result.

Figure 1 is a perspective view of my preferred form of machine, said machine being

shown with a butt in position and the wire being fed into the butt-socket. Fig. 2 is a plan of the machine, the butt being removed and the feed-carriage retracted. Fig. 3 is a longitudinal section at the line *x x*. Fig. 4 is a transverse section at the line *Y Y*. Fig. 5 is a plan showing the cutter or bit in its opened position. Fig. 6 shows the same closed, the wire severed and in the act of being "nicked" by the chisel. Fig. 7 is a horizontal section through the clamping-jaws, a "butt" being shown inserted between them, and the wire pintle represented as in the act of being forced into the socket of said butt. Fig. 8 is a vertical section through the same at the line *Z Z*. Fig. 9 is a perspective view of the combined cutter and chisel detached from the machine; and Fig. 10 is a sectional view, showing the butt after it has been removed from the machine, with the pintle secured in its proper position.

Of the above-described illustrations Figs. 5, 6, 7, 8, 9, and 10 are drawn on an enlarged scale.

A represents a stout bed-plate or table, which supports the operative parts of the machine, said table being elevated a suitable distance upon legs B. Projecting upwardly from this table are plummer blocks or boxes *c c' c''*, which afford journal-bearings for the driving-shaft, C, that is disposed longitudinally of the machine. This driving-shaft carries at one end a heavy fly-wheel, D, that may be operated either by the winch or handle *d*, or by a suitable belt connection with a steam-engine or other motor. That portion of the driving-shaft the most remote from the fly-wheel has secured to it a drum, cylinder, or hub, E, from a part of whose periphery a helical flange or cam, *e*, projects. The object of this cam is to advance a feed-carriage, F, which it accomplishes by coming in contact at the proper time with a roller, G, that is journaled upon a stud-shaft, *g*, projecting laterally from said feed-carriage or slide. Projecting downwardly from this carriage is a shank or stem, *f*, that traverses a longitudinal slot, *a*, in the table, and thereby serves to maintain said carriage in its proper rectilinear path. This carriage is retracted by a weight, H, although a spring may be substituted therefor. This weight is suspended from a rope or

chain, *h*, which, after being rove around a pulley or grooved roller, *I*, is secured to an arm, *i*, which projects laterally from the carriage *F*. The retraction of carriage *F* is limited by a gage-bar, *J*, whose screw-threaded portion *j* engages with a suitable lug, *j'*, of the table *A*. Pivoted, at *f'*, to the feed-carriage is a jaw or detent, *K*, having the shape of a bell-crank, the long arm of which, *k*, is acted on by a spring, *L*, in such a manner as to force its short arm *k'* toward the shoulder *l* of carriage *F*, for a purpose which will presently appear. Rigidly secured to the table *A* is a short stout block or abutment, *M*, within which is fitted a perforated steel guide, *m*, that receives the wire or rod *W*, to be employed for the pintle of the hinge. Adapted to have a reciprocating movement upon this abutment, and transversely of the machine, is the cutter *N*, which consists of a steel plate having a bit, *n*, and a chisel or nicking device, *n'*, which latter enters the slot *m'* of said abutment. This plate *N*, with its cutter and chisel, is clearly shown in Fig. 4, and it will be seen, by referring to said illustration, that the chisel or nicking device *n'* has an oblique cutting-edge, the object of which is to impart a correspondingly-shaped incision in one side of the wire *W*, and thereby produce an outwardly-projecting barb or fin, *X*, upon said wire, for a purpose which will presently appear. The cutter is advanced toward the abutment or anvil *M* by a pin, *O*, that projects radially from the driving-shaft *C*, the retraction of said cutter being affected by a spring, *P*. One end of this spring is fixed to the table *A*, while its free end engages over a flange or lip, *p*, of the cutter. Secured to the table *A* is the fixed jaw *Q* of a clamp, *Q Q'*, of which the movable jaw *Q'* slides within the transverse slot *a'* of the bed-plate, said sliding jaw being opened and closed by the action of the supplementary arm *R* of a bell-crank, *R R'*, that is pivoted at *r* to the table of the machine, as more clearly shown in Fig. 4. The clamp *Q Q'* not only maintains the butt accurately in line with the guiding-die *m*, but it also prevents the butt being burst or cracked when the pintle is forced into its socket. The horizontally-projecting arm *R'* of this bell-crank carries a weight, *S*, while the upwardly-projecting arm *R''* of the same is adapted to be acted upon at the proper moment by the cam *T*, which is keyed upon the driving-shaft *C*. Secured within a stout lug, *U*, and in line with the perforated guide *m* of the anvil *M*, is a rigid bar, *V*, against which the outer end of the butt rests when the wire or rod is being forced into the same. This rod, by bearing against the solid or unperforated end of the butt *Y*, prevents any longitudinal shifting of the latter by the forcible entrance of the pintle within its socket *y*, as clearly shown in Fig. 7. *W* is the wire or rod to be employed for the pintles of the hinges, and said rod is passed between a number of grooved rollers, *w*, which take out any bends or other irregularities that may exist in said rod. These rollers rotate in

a horizontal plane, and are arranged so as to maintain the straightened wire in line with the perforated guide *m*.

This machine operates in the following manner: The wire or rod *W* is first passed through between the rollers *w*, arm *k'*, and shoulder *l*, and then inserted within the perforated guide *m*, the butt *Y* of the hinge being placed in the opened jaws *Q Q'*, with the outer or unperforated end of said butt resting against the rigid bar *V*. In this position of the butt it will be seen that its socket *y* is exactly in line with guide *m*, and, as soon as the driving-shaft *C* is rotated in the direction indicated by the arrow upon the fly-wheel in Fig. 1, the weight *S* operates the bell-crank *R R' R''* in such a manner as to close the sliding jaw *Q'*, and thus temporarily clamp the butt *Y* immovably to the machine. As soon as the butt has been thus clamped in its proper position, the rotation of shaft *C* causes the cam *e* to revolve against the roller *G*, so as to advance the feed-carriage *F* toward the abutment or anvil *M*. During this advancement of said carriage, the rod *W* is securely gripped between the arm *k'* and shoulder *l*, and consequently the wire is fed forward a distance equal to the stroke or travel of said carriage *F*, which length of stroke has been previously regulated by the gage *J*. The rod is thus carried forward through the guide *m* with a positive movement, and forced into the socket *y* of the butt, barbed end foremost, into the supporting blind-knuckle or member of the hinge. The pin *O* now strikes against the cutter *N*, and advances it toward the anvil *M* with such force as to cause its bit *n* to sever the wire. As soon as the wire is secured, the chisel *n'* is brought to bear within the recess *m'*, so as to prevent the wire or rod being withdrawn by the retraction of carriage *F*, which retraction of said carriage is effected the moment the cam *e* has ceased to act upon the roller *G*. This prong or chisel *n'* serves the double purpose of retaining the wire within the die *m*, while the carriage or feeding mechanism *F K L* is being retracted, and it also nicks said wire obliquely, so as to form an outwardly-projecting barb, *X*, as seen in Figs. 6, 7, and 10. This yielding barb or fin curves in such a direction as to allow the wire to enter the butt with comparative ease; but the moment any attempt is made to withdraw said wire, the barb then impinges against the side of socket or recess *y*, so as to hold the pintle securely in its proper axial position within the butt. While the carriage is being retracted the wire *W* passes freely between the arm *k'* and shoulder *l*, as the detent *K* acts only during the forward stroke of said carriage. Immediately upon the severing of the wire the continued rotation of shaft *C* brings the cam *T* to bear against the arm *R''*, in such a manner as to rock the bell-crank *R R' R''* upon its pivot *r*, thereby retracting the sliding jaw *Q'*, and allowing the wired butt to be removed from the machine, and an unwired or pivotless one to be substituted for it, after which the

above-described operations are again repeated. When removed from the machine, the butt has projecting from its socket a wire pin, pivot, or pintle of sufficient length to engage with the socket of the other leaf or member of the butt, as seen in Fig. 10. The act of applying the other hinge-leaf may then be accomplished by hand in the usual manner. Owing to the manner in which the eccentrics *e* T and pin O are disposed upon the shaft C, the various operations of nicking the wire, feeding it in, severing it with the bit, clamping it so as not to be withdrawn, and then releasing the wired butt, are all performed in an automatic and consecutive way, which not only insures the most perfect uniformity in construction, but enables a large number of hinges to be manufactured in a short time, thereby diminishing the cost of these articles.

I have described a machine such as employed by myself for inserting the wires in butt-hinges, but reserve the right to modify or entirely to reorganize the apparatus, as it is evident that my invention consists in the auto-

matic formation of butt-hinge pintles from a coil of wire or a continuous rod, without any reference to the special appliances by which the feeding in and severing of the rod or wire are accomplished.

I am aware that it has been proposed to secure the two members of the common or inseparable hinge by roughening or rusting that end of the pintle which occupies the uppermost knuckle, and which, consequently, is the end last inserted. I, therefore, disclaim novelty in such roughening and mode of insertion after the two parts or butts are set together.

I claim as my invention—

The combination, with the reciprocating feed-carriage F *f*, guide *m*, jaws Q Q', and cutter N, the retaining and nicking die *n'*, substantially as and for the purpose designated.

In testimony of which invention I hereunto set my hand.

FRANK SWAN.

Attest:

GEO. H. KNIGHT,
JAMES H. LAYMAN.