(No Model.) 2 Sheets—Sheet 1.

# A. M. BEAUCHAMP.

## WIRE NAIL MACHINE.

No. 456,789. Patented July 28, 1891.

Fig. 1.

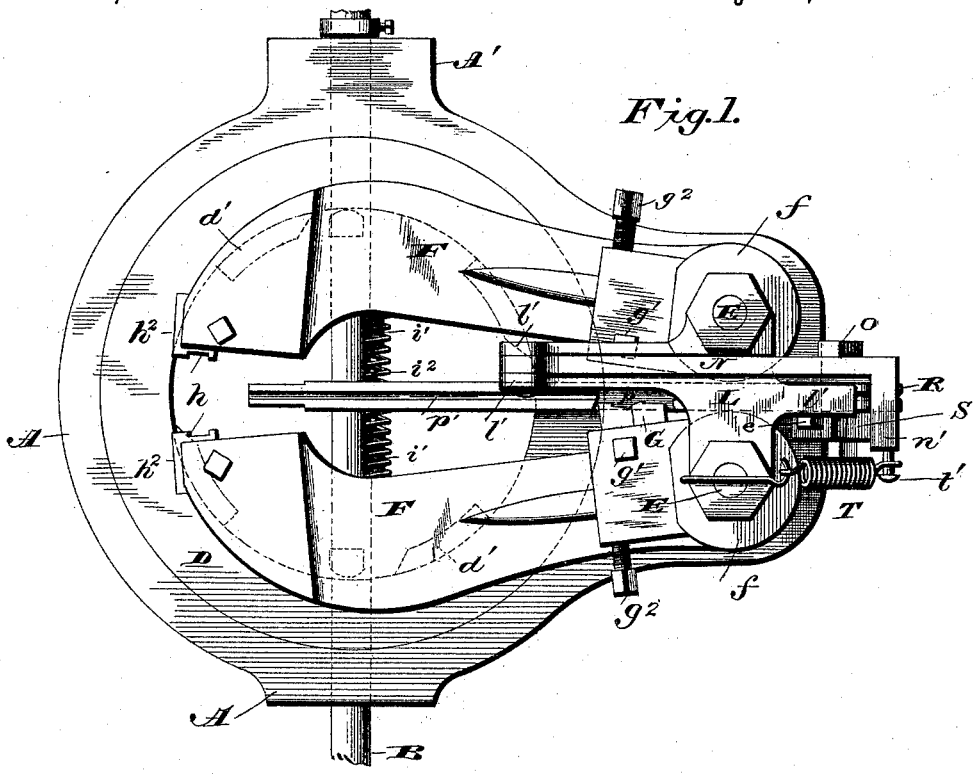
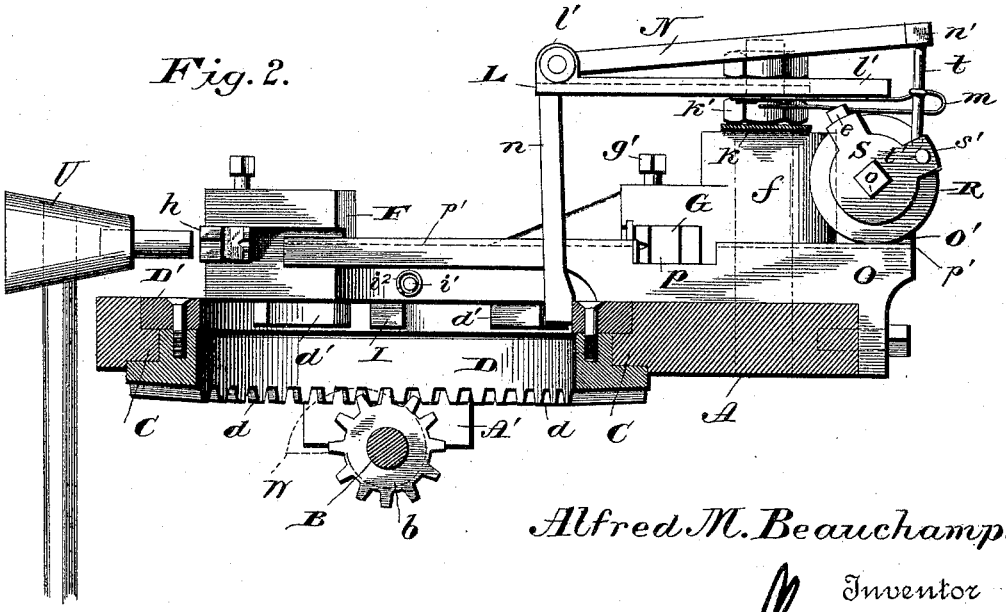



Fig. 2.

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by

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Witnesses

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(No Model.)

2 Sheets—Sheet 2.

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## WIRE NAIL MACHINE.

No. 456,789. Patented July 28, 1891.

Fig.3.

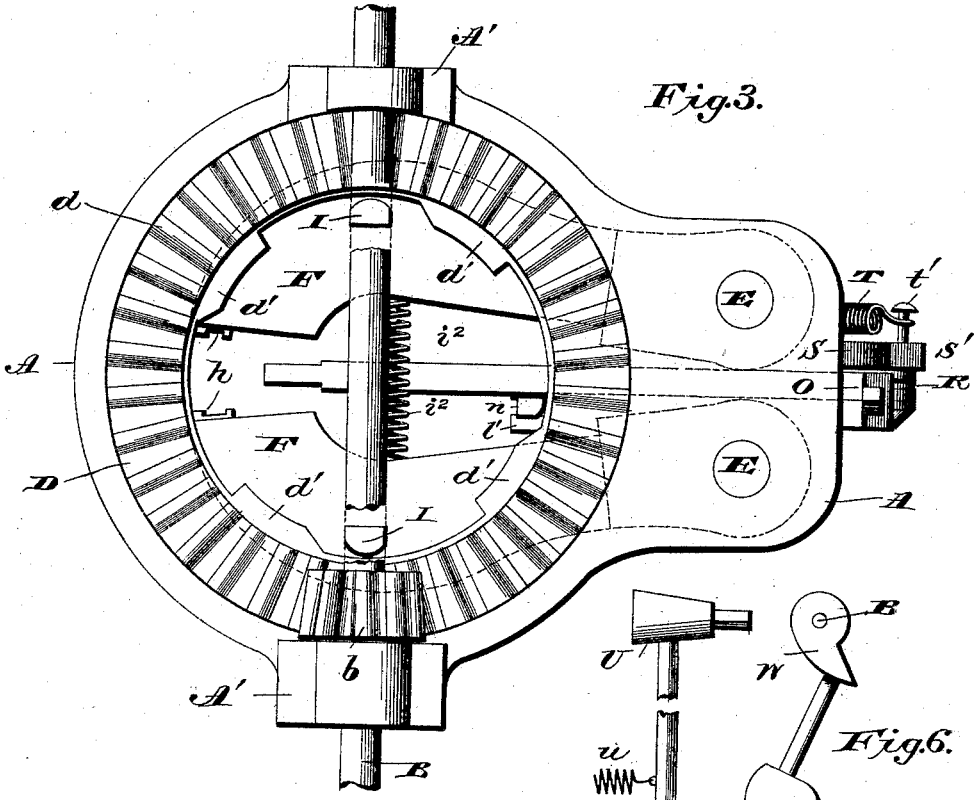



Fig.6.

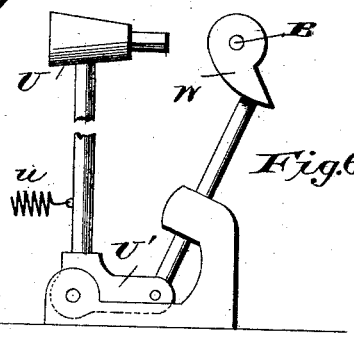
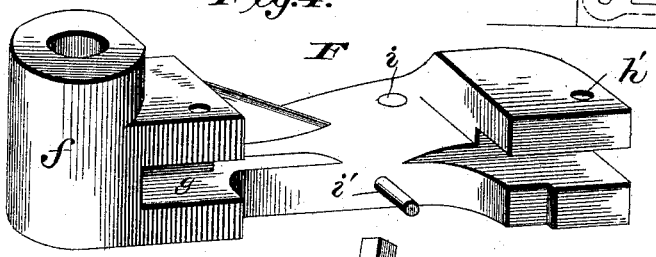



Fig.4.



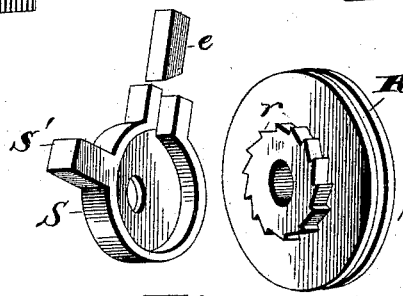




Fig.5.

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# UNITED STATES PATENT OFFICE.

ALFRED M. BEAUCHAMP, OF HINSDALE, MASSACHUSETTS.

## WIRE-NAIL MACHINE.

SPECIFICATION forming part of Letters Patent No. 456,789, dated July 28, 1891.

Application filed September 6, 1890. Serial No. 364,159. (No model.)

*To all whom it may concern:*

Be it known that I, ALFRED M. BEAUCHAMP, a citizen of the United States of America, residing at Hinsdale, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Wire-Nail Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide an improved machine for forming nails from a continuous length of wire; and it consists in the construction and combination of the parts of the machine and dies used in connection therewith, as will be hereinafter fully set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a nail-making machine constructed in accordance with my invention. Fig. 2 is a transverse sectional view. Fig. 3 is an inverted plan view; Fig. 4, a detail perspective view of one of the pivoted jaws detached; Fig. 5, a detail perspective view of part of the feed mechanism; Fig. 6, a side view of the hammer and operating means therefor.

The main frame A consists of an annular casting having at diametrically-opposite points depending bearing-blocks A′, formed integral therewith, within which is journaled a shaft B, driven or rotated in any suitable manner, and one side of this casting is extended or enlarged to provide a bearing for the nail forming and cutting jaws and feeding mechanism, to be hereinafter described.

The annular portion of the casting A has an inwardly-projecting shoulder C, to which is clamped a toothed ring D, the teeth *d* of which are engaged by a pinion *b*, keyed upon the main shaft B. The upper section D′ of the annular ring D is provided with inwardly-projecting lugs *d*′, one of the ends of which is inclined or beveled, as shown in Figs. 1 and 3. These lugs serve to operate or close the movable jaws which carry the dies for forming the nail.

To the enlarged end of the casting A are rigidly secured upwardly-projecting pins E E, which serve as bearings for the movable jaws F F, said jaws having enlarged hubs *f*, which embrace the pins, and said jaws are also provided with die-receiving openings *g*, within which are located the dies G, said dies being retained in place by set-screws *g*′ and adjusting-bolts $g^2$. The jaws F are provided near their free ends with inwardly-projecting portions having recesses for the reception of the dies *h*, and are perforated at *h*′ to receive the set-screws for clamping the dies in place. On the under side of the jaws depend lugs I, which are secured in place by having the stems *i* thereof project up through the said jaws, said stems being either screw-threaded or riveted at their upper ends. The lugs I are adapted to contact with the projections or lugs *d*′, formed on the inner circumference of the upper section of the ring D, and act to bring the free ends of the jaws together when the ring D is operated. The inner sides of the jaws carry pins *i*′, which serve to retain in place a spiral spring $i^2$, the tendency of which is to throw the jaws apart and hold the lugs I in contact with the upper section of the ring D. It will be observed that the dies *h* and G, which form the nail, are both carried by the jaws F F.

The bolts E E pass through the apertures in the hub portions *f* of the jaws, and immediately above said hub portion is placed a flat plate *k*, which prevents the bolts E separating, nuts *k*′ being secured upon the bolts immediately above the plate *k*. A plate or casting L is secured between the bolts E by means of nuts, as shown, and this plate has an extended portion *l*, to which is attached a flat spring *m*, which bears upon the face of the feed-wheel. The opposite extended end of this plate L is provided with ears *l*′, between which the plate is cut away to permit the lower member of the bell-crank lever N to lie therein, said bell-crank lever being pivoted to said ears. The upper surface of the plate L is channeled its full length to allow the upper member of the bell-crank lever to lie partially therein. The lower member *n* of the bell-crank lever N extends downwardly between the jaws F F and is engaged by the projecting lugs *d*′ on the ring D′ to operate the bell-crank lever to depress the angular projecting end *n*′ thereof and actuate the feed

mechanism by an intermediate connection or pin.

To the enlarged end of the casting A is secured a casting or forging O, to near the upper end of which is journaled by a horizontal bolt *o* the feed mechanism, (shown more clearly in Fig. 5,) and which consists of the feed-wheel R, provided on its periphery with a groove, the base of which is milled, said groove lying immediately above the groove *p'* in the casting O. On one side of the feed-wheel R is formed a ratchet-wheel *r*, a casing S lying over said ratchet-wheel, said casing being provided with an opening through which passes a pawl *e*, which may either operate by gravity or a spring. The covering-plate S is also provided with a projection *s'*, which is recessed on one side to provide a socket-bearing for a pin *t*, which rests in said socket and in a similar socket in the end *n'* of the bell-crank lever N. The projection *s'* is also provided with an outwardly-projecting pin *t'*, with which engages a suitable spring T, attached at its other end to the nut on the upper end of the bolt E in any suitable manner. The central opening of the feed-wheel R is preferably of larger diameter than the bolt which passes through the same, so that said feed-wheel may have a slight vertical play thereon, the feed-wheel being held down against the wire, which passes under the same by the pressure exerted by the spring *m*, hereinbefore referred to.

The casting O extends between the jaws for near their full length, and its upper surface is longitudinally grooved, and at the point between the dies G is cut away at *p* to permit said dies to operate upon the wire, which is fed along the groove *p'* by the feed mechanism hereinbefore described.

The dies G may be so constructed as to form either one or two nails, said dies shaping the wire to partially complete the points and partly separate the wire, and as the wire is forced forward by the feed-wheel it is cut by the last dies *h*, clamped between the same, and one end of the wire upset upon the outer face $h^2$ of the dies *h* by the hammer U, said dies of course being in a closed or clamping position. The hammer U is retracted by a spring *u*, said hammer being suitably journaled in a frame, and to the handle or bar of said hammer is secured a plate U', pivoted to the supporting-frame. The portion U' carries pivotally a bar, which passes loosely through an opening in the frame, its upper end contacting with a cam W, keyed upon the shaft B, which forces the hammer upon the metal beyond the dies *h* to upset the same and form the head.

By means of the machine hereinbefore described nails can be made from a continuous piece of wire, and it will be observed that the dies G, which have to exert the greater force upon the wire in cutting the same, are located near the fulcrum, while the outer dies, which merely have to finish the nails, are at the end of the jaws.

A machine constructed as hereinbefore shown is comparatively light and simple, and by changing the feed-wheel and dies the machine may be used in manufacturing nails of different lengths and thicknesses.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wire-nail machine, the combination of the main frame carrying a rotatable circular ring with lugs, pivoted jaws mounted on the main frame and provided with depending portions or lugs with which the first-named lugs engage, said jaws carrying dies, and feed mechanism intermittently rotated by a bell-crank lever actuated by the lugs on the annular ring, substantially as set forth.

2. In a wire-nail-making machine, the combination of the main frame, rotatable ring or disk supported thereby and provided with projecting lugs, jaws carrying adjacent to their fulcrums and at their outer ends dies adapted to be closed by the lugs engaging lugs on said jaws, intermittent feed mechanism also operated by the lugs on the rotatable ring, and a hammer adapted to form the heads of the nails operated from the main shaft, substantially as set forth.

3. In a nail-making machine, the combination of the main frame or casting A, a driving-shaft journaled thereto and provided with a pinion which engages with the teeth of the ring D, said ring being made in two sections, the upper section D' having inwardly-projecting lugs, each having a beveled end, die-carrying jaws F, pivoted above the main frame and provided with depending lugs with which the inwardly-projecting lugs *d'* engage, and feed mechanism also operated by said lugs, and a swaging-hammer operated from the main shaft B, substantially as shown, and for the purpose set forth.

4. A feed mechanism for wire-nail machines, constructed substantially as shown, consisting of a bell-crank lever, grooved feed-disk R, having a ratchet-wheel, covering-plate carrying a pawl, and a recessed arm with which a link-pin actuated by the bell-crank lever engages, and a spring for retracting the covering-plate, substantially as set forth.

5. In a machine for manufacturing wire nails, the combination of the annular bed-plate, ring D, with projecting lugs or cams *d'*, die-carrying jaws adapted to be closed by said lugs, a wire-supporting frame O, having a grooved extension cut away in the path of the first dies, a grooved feed-wheel R, located above said frame O and held in spring contact therewith, means for intermittently rotating said feed-wheel, and a swaging device operated from the main driving-shaft, substantially as set forth.

6. In a wire-nail machine, the combination

of the annular casting A, within which is secured a rotatable ring made up of the parts D and D′, the lower portion of said ring having gear-teeth with which a pinion mounted on the main shaft engages, lugs or cams *d′*, formed on the inner edge of the upper ring D′, die-carrying jaws F, pivotally secured to the main frame, a spring for throwing said jaws apart, depending portions I, connected to said jaws to lie in the path of the lugs *d′*, a casting O, having an upwardly-extending portion to which a feed-wheel is journaled and a horizontally-grooved extension in which the wire travels, a bell-crank lever having one end extending downwardly between the jaws to contact with the lugs *d′*, the opposite end of said bell-crank lever being in engagement with the feeding mechanism, and a spring adapted to bear upon the feed-wheel, substantially as set forth.

7. In a nail-making machine, the combination of the swaging-hammer, main driving-shaft having a cam W, a frame to which the hammer is pivoted, and a bar loosely supported to engage with the face of the cam, substantially as set forth.

8. In a machine for forming wire nails, the combination of the jaws F F, provided with die-receiving recesses and depending lugs with which cams or lugs engage to move said dies toward each other, and pins for maintaining a spring which tends to throw said jaws apart, substantially as shown, and for the purpose set forth.

9. In combination with a feed-wheel R, having a ratchet-wheel formed thereon, a casing for covering said ratchet-wheel, said casing also carrying a pawl, a projecting arm formed on the casing with which a pin engages for rotating the feed-wheel, and a spring for retracting the casing, substantially as set forth.

10. In a machine for manufacturing nails, the feed mechanism herein shown and described loosely journaled on a shaft so as to be capable of a vertical movement, a spring adapted to bear upon the periphery of the feed-wheel to hold the same in contact with the wire which is fed to the nail-forming dies thereby, substantially as set forth.

11. In a nail-making machine, the combination of the pivoted jaws F F, having recesses near their hubs for the reception of double dies G and at their ends for single dies *h*, and means for opening and closing said jaws upon the wire from which the nail is made, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED M. BEAUCHAMP.

Witnesses:

JOSEPH N. PEARTREE,

W. C. PRESTON.