(No Model.) 2 Sheets—Sheet 1.

A. G. WILKINS.

MACHINE FOR ROLLING WIRE NAILS.

No. 385,784. Patented July 10, 1888.

Fig. 1.

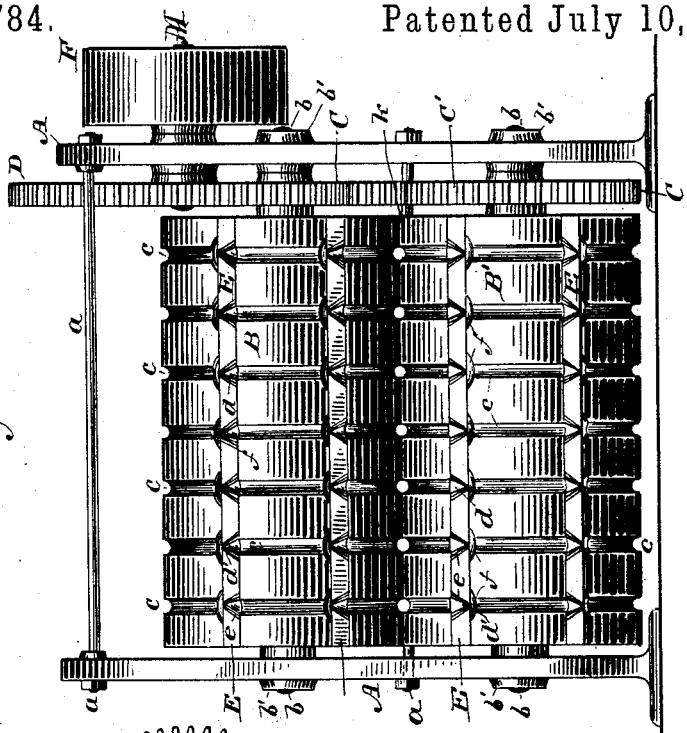
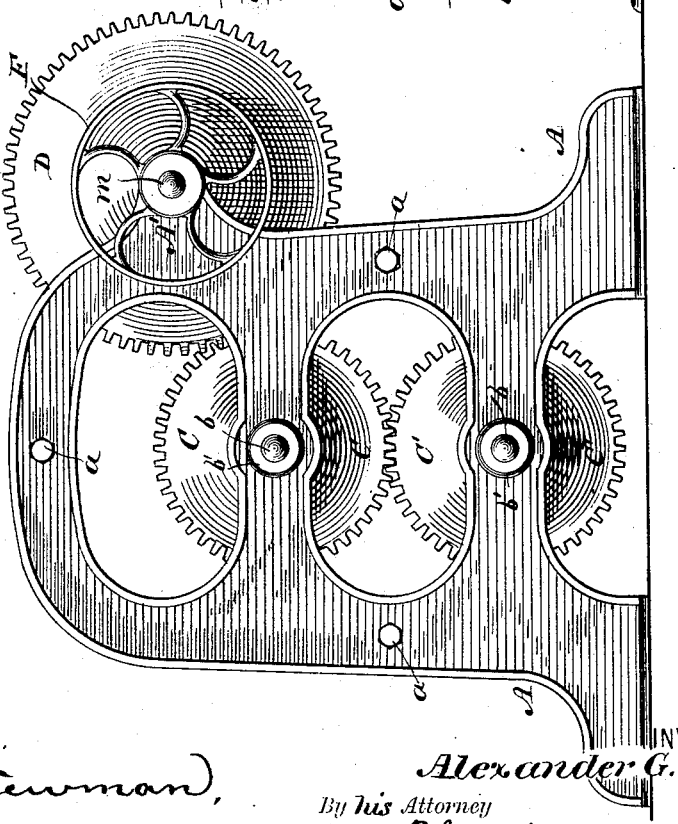


Fig. 2.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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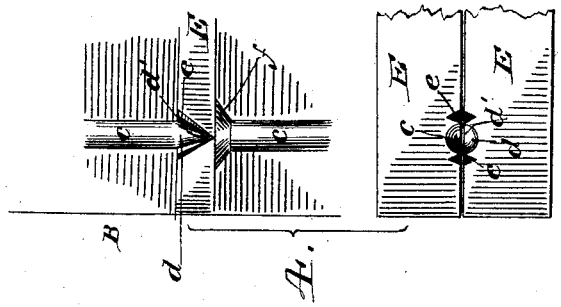

Fig. 4.

Fig. 5.

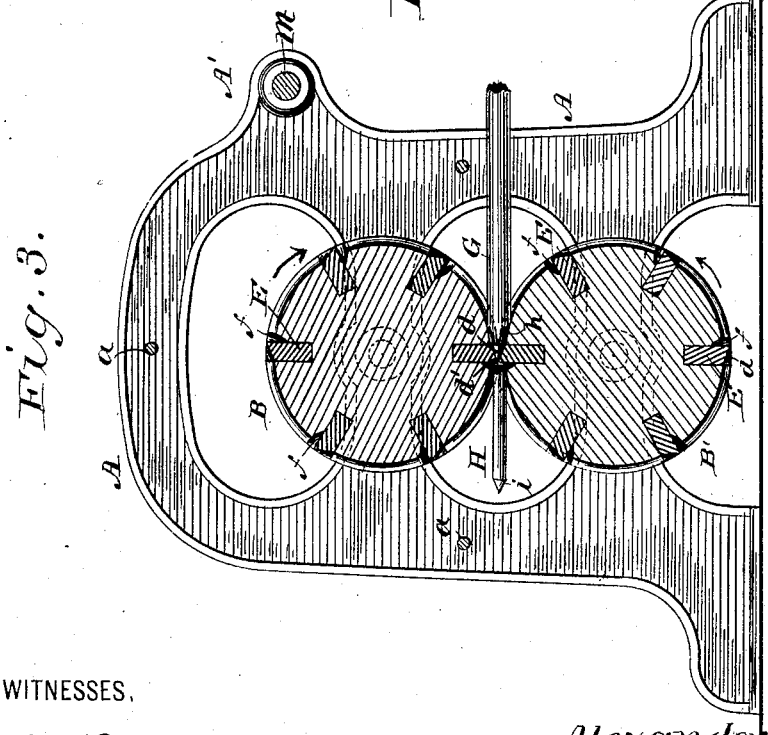

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALEXANDER G. WILKINS, OF MEADVILLE, PENNSYLVANIA.

MACHINE FOR ROLLING WIRE NAILS.

SPECIFICATION forming part of Letters Patent No. 385,784, dated July 10, 1888.

Application filed January 18, 1888. Serial No. 261,140. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER G. WILKINS, of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Making Wire Nails; 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.

My invention relates to an improvement in machines for making nails from wire.

The object of my present invention is to produce a machine by which nails may be made from wire taken from a coil, the nails being headed and pointed at one operation.

A further object is to so construct a machine to make nails from wire that the wire material will be compressed in the body as it is passed into the machine, and thus provide material for an integral head on each nail as it is being formed, and at the same time the following nail is pointed and cut loose from this head.

A further object is to furnish a nail-making machine that will produce nails complete from a continuous wire, and also afford a means for the rapid production of complete nails from one or several coils of continuous wire.

With these objects in view my invention consists in certain features of construction and combinations of parts, that will be hereinafter described, and pointed out in the claims.

Referring to the drawings that accompany this specification, Figure 1 represents a side elevation of the device. Fig. 2 is an end elevation of the machine. Fig. 3 is a cross-section of the die-rolls with dies in place. Fig. 4 is an enlarged view of a portion of one roll and a pointing and heading die. Fig. 5 exhibits a finished nail and an unheaded blank that is still attached to the continuous wire coil, the point being formed and the body of the nail reduced ready to receive the head.

A A represent the frame of the machine, which consists of two sides, preferably made of metal, with boxes *b'* (see Fig. 1) attached to or formed in the frame at proper points to receive the journals *b* of the roll B B', which are thus supported to revolve between the sides of the frame, that are held together by the spacing-bolts *a*, that secure the sides A A in connection, but separated a proper distance to permit the rolls B B' to revolve with their peripheral surfaces in contact, as at *k*, Fig. 1.

The rolls B B' are made of metal of sufficient diameter and length to permit a contact of surfaces, as just stated, and afford space lengthwise for the reception of a series of rounded or angular grooves, *c c*, &c., which are cut or otherwise formed in the cylindrical bodies of the rolls at spaced intervals, as shown in Fig. 1.

At one end of the rolls B B' the gear-wheels C C' are affixed to the shafts, of which the journals *b* are extensions, these toothed wheels having meshing contact with each other. Upon an integral arm, A', formed on one side of the frame A, the driving gear-wheel D is supported to revolve. This wheel, meshing with the gear-wheel C of the top roll, B, is adapted to transmit motion to both the rolls B B', which are caused to revolve toward each other in the direction indicated by the arrows in Fig. 3.

Upon an outward extension of the shaft M, which supports the wheel D, a pulley, F, is attached, which is designed to receive motion by a belt-connection to any source of power that is provided to move the machine.

Each of the rolls B B' is slotted lengthwise at spaced intervals, these slots being radial and equal in number in each roll, and as the rolls are of equal diameter the slots in one roll will exactly register with those formed in the other roll when these rolls are revolved.

Into each of the slots formed in the rolls B B' the dies E are fitted and secured by any proper means. These are preferably made of steel and at intervals in their length that correspond to the distance between the grooves *c c*, &c. These dies E are notched on their exposed edges, which latter conform to the peripheral surface of the rolls, as shown in Fig. 3.

The notches *d* (see Figs. 1, 3, and 4) are semi-conical in form, the apexes *d'* of which are located in the edge of the dies on the same side in each die in the roll B, and also in each die of the mating roll B', so that when the dies are made to line with each other the two half-conical excavations in each die will mate and produce a complete conical matrix or pointing-die that is adapted to form a conical point on wire which passes between the mating dies.

Upon each side edge of the conical excava-

tions *d*, that are made in the die E, a groove, *e*, is cut, (see Fig. 4,) these grooves being intended to afford sharp edges to the semi-conical depressions or excavations *d*, which will assure the proper removal of surplus material when the machine is in operation.

At points adjacent to the points of the conical excavations *d* of the dies E semicircular depressions *f* are formed in the grooves *e*, these depressions *f* being of the same depth and width wherever they are produced in the grooves of the rolls B B′, so that when a recess or cavity *f* in one roll mates with a similar depression in the adjacent roll the two will be adapted to produce a substantial head upon a piece of wire inserted between the rolls, providing the wire is of proper relative gage to suit the diameter of the grooves *e*, as will be further explained.

It is essential for the proper and rapid formation of nails in this machine that the wire used should be in a continuous coil as it is fed to each groove in the rolls, and the gage or diameter of the wire must be larger than that of the receiving-grooves *e*, so that the passage of the wire between the rolls will compress it and form a shoulder, as at *h*. (See Fig. 5.)

In operating the machine wire in coils or rolls is so supported that the strands may be entered in the grooves *e* on the sides of the rolls which are rotated in the direction indicated by the arrows in Fig. 3, and as the wire is previously annealed to render it soft the compressing action of the grooves will reduce the diameter and push the excess of material ahead, so that a shoulder, *h*, Fig. 5, is formed, which will be compressed in the cavities *f* of the rolls B B′, to produce heads on nails that have been previously pointed by the preceding set of dies.

It will be apparent from the foregoing description that annealed wire will be automatically drawn from a continuous roll or coil, or any number of coils not exceeding the number of grooves *e* in the rolls of the machine, and be conically pointed, the body compressed, which will render it hard enough to stand driving into wood, and, finally, that the excess of material forced forward by the dies in rolling the body of the nail from a gage of wire larger than the groove will be embedded in the heading-recess *f*, the edge of the dies E severing the head as soon as formed, and thus allowing the finished nail to drop clear of the dies.

The spaces between the dies E, it will be understood, represent the length of the nails, and each revolution of the rolls will form as many nails as there are sets of dies in these rolls multiplied by the number of grooves *e* in use. By a change of spacing distance between the dies E the length of the nails may be changed and longer or shorter nails be produced.

Slight changes might be made in the construction of the frame of the machine, and also of the other parts—as, for instance, the rolls may be made up of a series of disks mounted upon and secured to the shafts, each disk being grooved on its edge, and separate dies may be inserted in the disks, so that each pair that are in running contact will form nails in the manner already explained.

Other slight changes might be made in the constructive details of the device; hence I do not limit myself to the exact forms herein shown; but,

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

1. In a nail-machine, the combination, with two rollers or disks, each having a series of continuous circumferential grooves and a series of longitudinal slots, of bars located in said slots, each bar having a series of excavations or depressions therein registering with the grooves and constituting point-forming dies, substantially as set forth.

2. In a nail-machine, the combination, with a pair of rolls supported to rotate toward each other, and grooved on their cylindrical surfaces and provided with radial notches to receive pointing-dies, of dies that register with each other in pairs, these dies having conical recesses in their faces adapted to point wire nails, the dies having cutting-edges which sever a nail after its head is compressed in heading-recesses formed in the grooves adjacent to the pointing-dies, substantially as set forth.

3. In a nail-machine, the combination, with a pair of rolls supported to revolve and a means of revolving the rolls toward each other, of grooves formed in the rolls, dies located in the rolls transversely of these grooves, so as to lie opposite each other in pairs, conical depressions formed in the dies and adapted to point wire nails, and heading-recesses made in the grooved surface of the rolls adjacent to the pointing-dies, so as to head a nail that has been previously pointed and drawn from wire thicker than the grooves in which the nail is made, substantially as set forth.

4. A nail-machine having in combination two revolving rolls that are in contact and rotate toward each other, these rolls having grooves in their surface which are adapted to compress wire fed thereto from a continuous coil to produce the body of a nail, and also provided with dies which extend lengthwise of the rolls, so as to register in pairs, the dies being excavated to form a conical point on a wire nail, and also act in conjunction with heading-recesses made in the grooves of the rolls, so as to cut off a nail from the wire coil after a head has been formed on it, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXANDER G. WILKINS.

Witnesses:
JOHN REITZE,
B. F. CULP.