

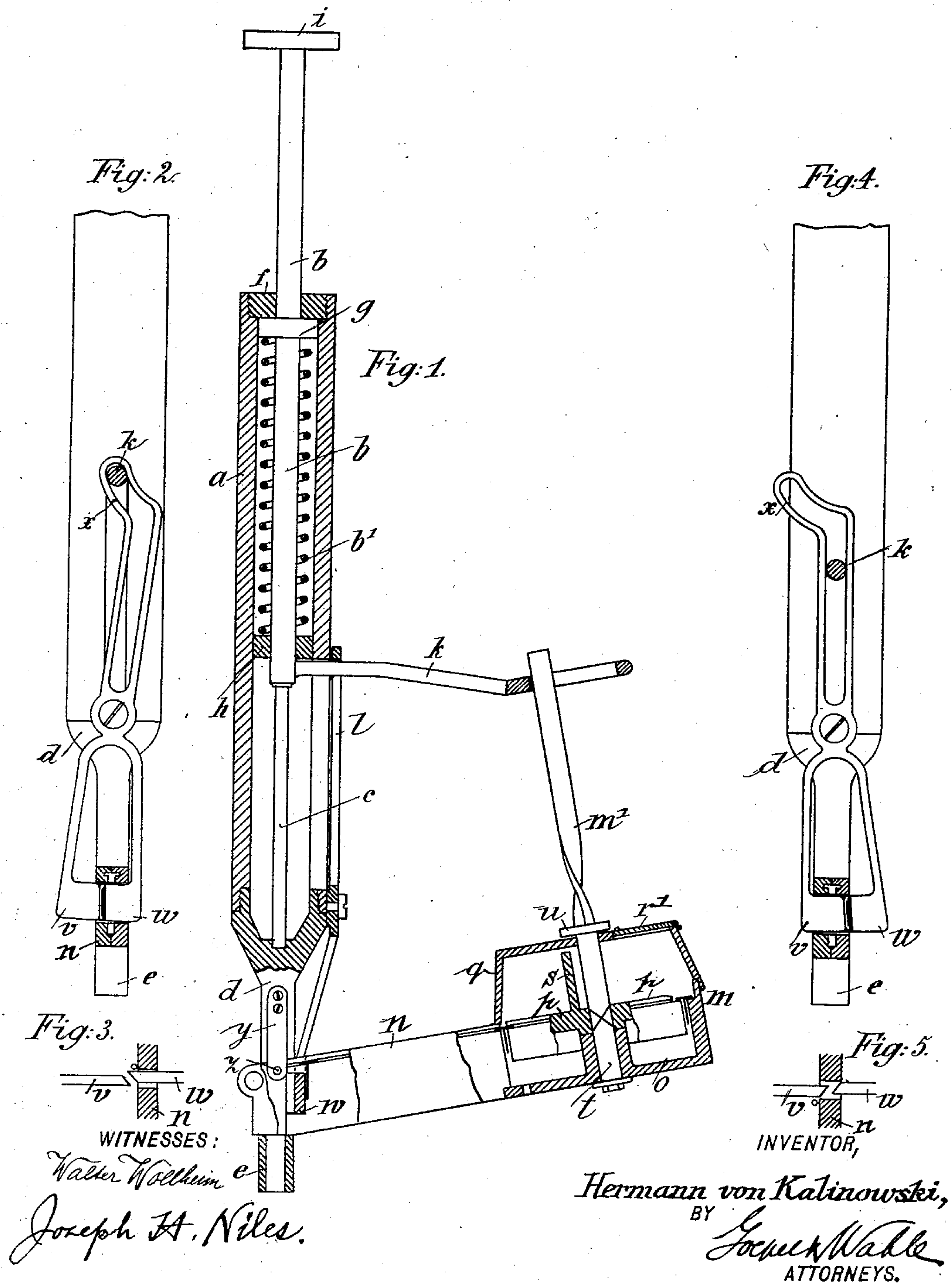
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Patented Mar. 4, 1902.

H. VON KALINOWSKI.
NAILING DEVICE.

(Application filed May 10, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

HERMANN VON KALINOWSKI, OF POSEN, GERMANY.

NAILING DEVICE.

SPECIFICATION forming part of Letters Patent No. 694,649, dated March 4, 1902.

Application filed May 10, 1900. Serial No. 16,152. (No model.)

To all whom it may concern:

Be it known that I, HERMANN VON KALINOWSKI, a citizen of the Empire of Germany, residing at Posen, Germany, have invented certain new and useful Improvements in Nailing Devices, of which the following is a specification.

In the manufacture of shoes it is necessary after the upper has been stretched around the last to connect the upper quickly with the insole on the last. This operation was heretofore performed almost exclusively by hand and forms an expensive and tedious operation in the manufacture of shoes. The same objection—namely, the lack of means for quickly driving the required nails—was met in the manufacture of cigar-boxes and similar articles. Attempts have been made to accomplish the operation by means of a machine; but none of the machines devised have been practically successful, for the reason that they were not sufficiently reliable and uniform in operation.

The machine which forms the subject-matter of this application meets all the requirements which can be demanded of a nailing-machine. It nails quickly, is reliable in operation, and can be attended to even by unskilled workmen.

The invention consists in the construction, arrangement, and combination of certain operative parts, whereby the machine is adapted for reliably performing its work, which will be more fully described hereinafter and finally pointed out in the claim.

In the accompanying drawings, Figure 1 is a vertical central section, partly in side elevation, of my improved nailing device. Figs. 2 and 4 are details of the mechanism by which the nails are fed to the nozzle or nail-tube of the machine, and Figs. 3 and 5 are detail horizontal sections showing the nail-feeding teeth in positions corresponding to Figs. 2 and 4, respectively.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, *a* represents an upright cylinder, in which is located a nailing-plunger composed of a shank *b* and a nailing-pin *c*, carried at the lower end of the same. To the lower end of the cylinder *a* is screwed the upper end of a guide-tube *d* for

the nailing-pin *c*, said guide-tube being extended so as to form a nail tube or nozzle *e*. The cylinder *a* is closed at its upper end by a disk *f*, which is screwed up against an interior shoulder of the cylinder. The nailing-plunger is guided in the disk *f* and provided with a collar *g*, which is rigidly brazed to the plunger. The lower end of the plunger-shank *b* is guided in a disk *h*, which is arranged near the middle of the cylinder *a* and rigidly attached thereto. Between the guide-disk *h* and collar *g* is interposed a helical spring *b'*, said spring holding the nailing-plunger in its raised normal position shown in Fig. 1. To the upper end of the shank *b* is attached a disk *i*. To the shank *b* is attached below the guide-disk *h* a laterally-extending arm *k*, which is guided in a slot of the cylinder *a* and which serves to actuate the anchor *l*, while its slotted opposite end engages an inclined shank *m'* of a nail-feeding device, so as to move said shank *m'* in the nail-receptacle *m* whenever the plunger is moved.

To the guide-tube *d* of the cylinder *a* is secured one end of a feed-channel *n*, which communicates with the bore of the guide-tube through an opening in the same, said opening having a cross-section corresponding to that of the feed-channel *n*, so that a nail which slides down in the inclined channel *n* is delivered into the bore of the nail guide or nozzle *e*.

On the upper end of the feed-channel *n* is mounted the nail-receptacle *m*, which consists of a lower part *o*, having a removable cover *q*. The lower part *o* is provided with a central hub or bearing, in the bore of which is rotatably located a shaft *t*, to which the feed-wheel *p* is secured. The feed-wheel is of such size and so mounted relatively to the part *o* that between the inner circumference of said part *o* and the outer circumference of the wheel *p* is a space of sufficient width so that the shank of a nail can move freely between the parts, while the head of the nail moves in a larger recess between the wheel *p* and the lower part *o*. Free movement of the nail between the parts *p* and *o* is thereby permitted. The guide-passage in the feed-channel *n* corresponds in cross-section with the space between the lower portion *o* and feed-wheel *p*. The lower portion *o* is provided

with an opening in its periphery, so that the nails which move along in the space between the lower portion and wheel *p* are fed into the feed-channel *n* and from there pass into the bore of the nozzle. The cover *q* extends over the lower portion *o* and filling-wheel *p* and is provided with an opening for the shaft of the filling-wheel and with an opening through which nails can be charged into the receptacle on raising the lid *r'*. On the feed-wheel *p* is arranged a transverse partition *s* in such a manner that the space below the cover *q* is divided into a larger and a smaller compartment, said partition being arranged preferably parallel to a plane passing at the axis of the feed-wheel *p* transversely through the nail-receptacle. The shaft *t* of the feed-wheel extends through the cover *q* and is provided above the same with a collar *u* and a spirally-bent portion *m'*, hereinbefore referred to. The outer slotted end of the arm *k* engages the spirally-bent portion and produces by its movement on the same an oscillating motion of the feed-wheel *p*, rotating it by the downward motion of the arm *k* in one direction and by the return motion of the same in the opposite direction. As before stated, from the space below the cover *q* the nails contained in the receptacle fall through the recess in the circumference of the feed-wheel *p* into the space between the same and the lower portion of the receptacle, from which they are conducted along the feed-channel to the nozzle *e*.

The operation of my improved nailing device is as follows: The required nails are first placed in the space below the cover *q*—i. e., in the larger of the two compartments of the feed-wheel. By the vertically-reciprocating motion of the nailing-plunger the arm *k* is reciprocated upon the spiral upper end of the shaft *t*. This imparts oscillating motion to the feed-wheel *p*. As the nails cannot follow the quick reversals of motion of the feed-wheel, they are more or less agitated and thrown about by the partition *s* and drop successively into the space between the feed-wheel *p* and the lower portion *o*, from which they are guided into the feed-channel *n* and from the same into the nozzle *e*. Without any additional mechanism the nails would be dropped through the nozzle during both the upward and downward motion of the plunger. It is therefore necessary to provide means for holding the nails as they are delivered from the feed-channel into the nozzle and also to provide means for regularly feeding the nails. The latter is accomplished by arranging on the cylinder *a* a laterally-oscillating escape-ment-anchor *l*, the construction and operation of which will be described. The anchor-teeth *v* and *w* each close the feed-channel *n*, but in two planes located one beyond the other, said planes being at a distance from each other corresponding to the thickness of a nail. When the apparatus is in the normal position of rest, a nail lies in position in front

of the tooth *w* and is arrested by the same. When the nailing-plunger *p* is pressed in downward direction, the arm *k* slides in the inclined upper recess *x* of the anchor-lever *l* in downward direction and causes thereby a lateral motion of the same. This imparts a sidewise motion to the tooth *w*, so that the tooth *v* is moved across the feed-channel *n*, and thereby closes the same. The nail which is located in front of the tooth *w* moves then, as there is no obstruction in its path, in the feed-channel *n* and rests against the tooth *v*, which closes in this position of the nailing-plunger the feed-channel *n*. When the nailing-plunger is moved in upward direction, the tooth *v* is moved laterally, so as to clear the feed-channel *n*, and permits the nail which lies against the same to pass into the bore of the nozzle *e*, the path in front of the same being clear. The tooth *w* of the anchor is moved simultaneously before the next following nail, so as to arrest its forward motion in the feed-channel *n*. For holding the nail in position in the nozzle *e* a retaining-spring *y* is secured to the outside of the same and provided with a projection or pin *z*, which extends through a perforation in the nozzle to a point in the same immediately below the level of the guide-passage of the feed-channel, so that when a nail is fed into the bore of the nozzle its head is supported on the projection *z* and the nail thereby retained. The nailing operation is performed by exerting pressure on the disk *i*, so that the nailing-plunger is pressed in downward direction, and the pin *c* carries the nail along, presses the projection *z* and retaining-spring *y* outwardly, and drives, finally, the nail that has been dropped through the nozzle into the work to be nailed. During the upward motion of the nail-plunger *b* a second nail is supplied to the nozzle *e*, and on again depressing the nailing-plunger said nail is driven into the work. The up-and-down motion of the plunger is repeated as many times as necessary, a nail being driven at each downward stroke. The arrangement of the feed-channel and nail-receptacle in a somewhat inclined position relatively to the axis of the nailing-plunger insures the reliable feeding of the nails by gravity from the nail-receptacle to the nozzle.

It is obvious that the mechanical construction of the nailing device can be altered in various ways without departing from the spirit of the invention, and the machine can be used for riveting as well as nailing.

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

In a nailing and riveting machine, the combination, with a nailing-tube, of a nailing-plunger in the same, a nail-receptacle, a feeding-channel connecting the nail-receptacle with the lower end of the nailing-tube, a shaft journaled in said nail-receptacle and extending upwardly from the same at an inclination to the nailing-tube, said shaft being spirally

bent at its exterior portion, a feed-wheel
mounted on said shaft within the nail-recep-
tacle, an escapement-anchor pivoted to the
nailing-tube, and at its lower end entering
5 the feeding-channel, the upper end of said
escapement-anchor being slotted and pro-
vided with an inclined slotted portion, and
an arm extending laterally from said nailing-
plunger through the nailing-tube and engag-
10 ing said escapement-anchor, and provided at

its outer end with a slotted portion engaging
the inclined spirally-bent shaft, substantially
as set forth.

In testimony that I claim the foregoing as
my invention I have signed my name in pres- 15
ence of two subscribing witnesses.

HERMANN VON KALINOWSKI.

Witnesses:

HERMANN BARTSEL,
ALBERT SCHENK.