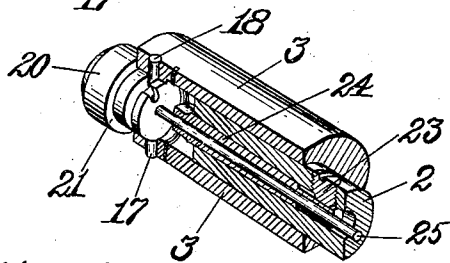
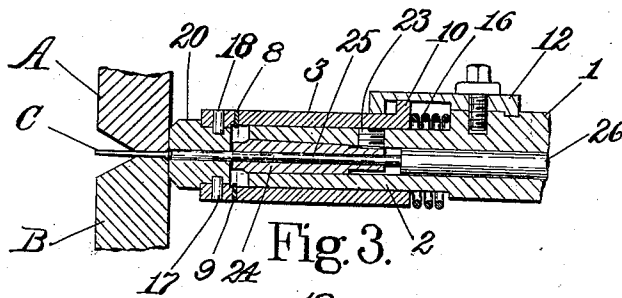
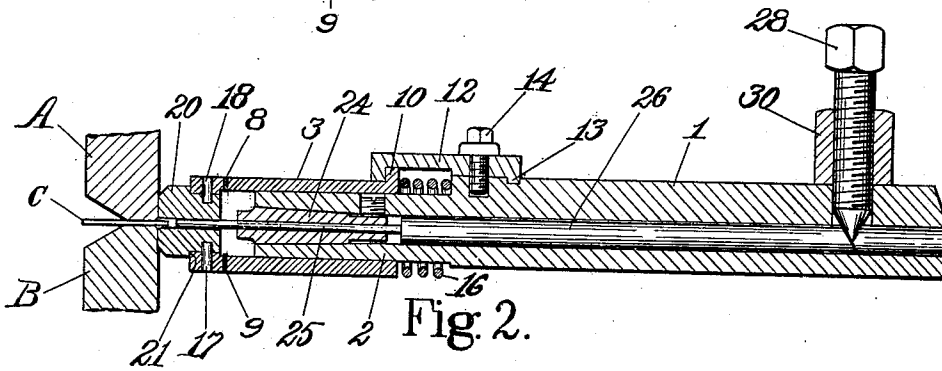
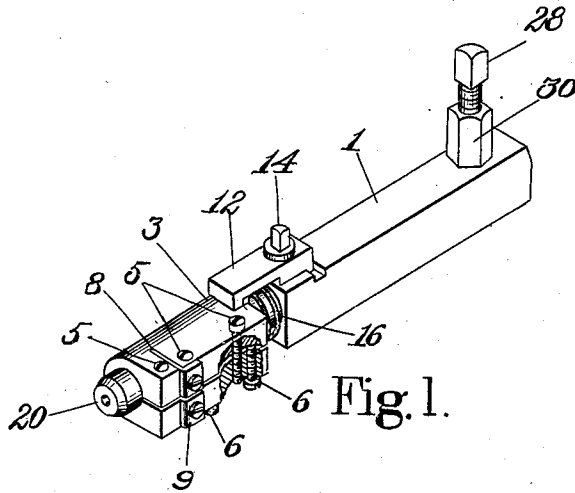


M. BROCK.
 APPARATUS FOR HEADING NAILS OR TACKS.
 APPLICATION FILED MAR. 4, 1908.

977,506.

Patented Dec. 6, 1910.



WITNESSES:
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Fig. 4.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR HEADING NAILS OR TACKS.

977,506.

Specification of Letters Patent.

Patented Dec. 6, 1910.

Application filed March 4, 1908. Serial No. 419,153.

To all whom it may concern:

Be it known that I, MATTHIAS BROCK, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain Improvements in Apparatus for Heading Nails or Tacks, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to nail making machines and more particularly to apparatus for heading nails or tacks.

In nail making machines it is usual to form a head upon one end of a nail blank, while the shank of the blank is held and shaped by suitable dies. The head is usually formed by a reciprocating member which contacts with and upsets the material of the exposed end of the blank into the form and shape of a head, cooperating with the holding and shaping dies in this operation. In forming flat-headed nails the reciprocating member is a simple punch, but where heads of some definite thickness and diameter are desired the heading apparatus includes a heading die in the reciprocating member.

It is an object of this invention to improve the heading apparatus wherein a heading die is employed.

It is also an object of this invention to provide means to compensate for the wearing of certain parts of the heading apparatus. As the heading die is actuated at approximately three hundred revolutions per minute, and under great pressure, the wearing away of the sliding bearings is appreciable and any looseness in such bearings results in throwing the heading die off center. Even a slight eccentricity in the die will form the head off center relatively to its shank, and such nails are objectionable and are generally discarded in the subsequent sifting operations. Thus it will be readily seen that a practical compensating means is of considerable value. An important feature of the compensating means herein shown is that the compensating operation also serves to recenter the sliding parts so that they will again run accurately without further adjustment.

In former constructions of heading dies,

such for example as that shown in United States Letters Patent No. 722,669, the sliding bearing of the heading die was so formed that it would not run accurately and was altogether too wobbly for the best work. As above noted, any inaccuracy in the movement in the heading die, whereby the nail heads are formed off center with respect to their shanks, is most undesirable.

It is a further object of this invention to provide means to insure the accurate action of the heading die in its operations, and to obviate any wobbling movement during the reciprocation of the heading die.

Preferably, and as herein shown, the acting portions of both the heading die and heading pin are constructed so as to be easily removed from the rest of the apparatus, and thus can be quickly replaced. Means is also provided to adjust the heading pin forwardly to facilitate forming heads of different thicknesses and to compensate for the wearing away of the acting end of the heading pin.

In a preferred form of the invention, as shown in the drawings, Figure 1 is a perspective view of the die carrier, the heading die, and the sliding sleeve, with a portion of the sleeve broken away. Fig. 2 is an enlarged view, showing the apparatus in cross-section, and a portion of the nail forming dies, with a nail blank in position to be headed. Fig. 3 shows the apparatus in cross-section at the completion of the heading operation, a portion of the shank of the die carrier being omitted. Fig. 4 is an enlarged view partly in section, particularly showing the attaching means of the die and sleeve.

In the drawings A and B designate a portion of the usual nail forming dies which hold and shape the shank of the nail blank and cooperate with the heading die to form the head. C is a nail blank being operated upon.

The die carrier is formed with the shank and with a portion 2 somewhat reduced in diameter and preferably circular in cross-section. The sleeve 3 is constructed to slide upon the reduced portion 2, and said sleeve is sawed or split longitudinally, as shown in Fig. 1. Uniting the split portion are three tightening screws 5, 5, 5, and to oppose their tightening action are two bearing screws 6, 6,

and by means of these two sets of screws the sleeve can be accurately adjusted to fit upon the portion 2 of the die carrier. Said sleeve is also sawed transversely of said longitudinal split, near the end holding the heading die, and shim pieces 8 and 9 are set in said transverse cut and secured by set screws to the exterior of the sleeve. To limit the forward movement of the sleeve 3, a link 12 is secured to the shank 1 as by a screw 14 and a lug engaging a groove in said shank, and this link is provided with a flange on the forward end arranged to contact with a corresponding flange 10 formed upon the sleeve 3. An expansible spring 16 is provided, encircling the reduced portion 2, and bearing against the shank of the carrier and an end of the sleeve 3, acting to hold said sleeve normally at its forward position with the flange 10 in contact with the corresponding flange upon the link 12, as shown in Figs. 1 and 2.

The heading die 20 is secured to the sleeve 3, forward of the shim pieces 8 and 9, and preferably by easily detachable means, such as a bayonet joint effected by the pins 17 and 18 engaging a groove formed in the die 20, as shown in Fig. 4. Said die is preferably formed with an annular shoulder 21, bearing against the adjacent face of the sleeve, this line of contact mainly transmitting the longitudinal strain put upon the die by the operation of the apparatus.

The die carrier is bored from end to end and receives a rod 26. The forward part of said bore is given an outward taper to receive a split chuck 24, said chuck having a longitudinal bore to receive the heading pin 25. The chuck is constructed to clamp the heading pin as the chuck is wedged into the tapering bore of the die carrier, and a set screw 23 may be provided to hold said chuck when wedged into the desired position. The heading pin 25 when clamped by the chuck 24 is arranged with its acting end entering the die orifice, or central bore of the die 20, from the rear of the die, and with its other end abutting against the forward end of the rod 26. To provide for longitudinal adjustment of the heading pin, the rear end of the rod 26 is beveled and the conical end of a screw 28 bears against the rod, as shown in Fig. 2. As the screw 28 is set inwardly the rod 26 and heading pin 25 are moved forwardly. 30 represents a lock nut to maintain the screw 28 in adjusted position.

The die 20 is formed with the die orifice or bore of a size desired for the diameter of the heads of nails to be made. The heading pin 25 is similarly proportioned and is intended to enter and fit accurately the die orifice, but is loose enough to slide in said orifice relatively with the die 20. The nail forming dies A and B may be provided with a slight die orifice to form a conical portion

of the nail head in cooperation with the heading die, the cylindrical portion being formed within the die 20. The longitudinal adjustment of the heading pin 25 within the die 20 and the length of nail blank available for the heading operation determine the thickness of the head to be formed.

The die carrier is usually adjustably secured by its shank 1 upon a heading lever, and the lever is so actuated that the die carrier and the heading die are reciprocated toward and away from the dies A and B, as is well known in the art, it being intended that the heading die 20 shall contact with the sides of the dies A and B, as shown in Figs. 2 and 3. It will be noted that the long bearing afforded by the sleeve 3 upon the reduced portion 2 of the die carrier, insures accurate reciprocation of the die 20 during the operation of the apparatus.

The transverse slit in the sleeve in which the shim pieces 8 and 9 are affixed, enables that section of the sleeve 3 which slides upon the reduced portion 2 of the carrier to be adjusted to fit closely thereon and thus to compensate for the wearing of the sliding parts, while the forward section of the sleeve 3 remains as adjusted to hold the die 20. The shim pieces 8 and 9 prevent the die holding section of the sleeve from being bent and thrown out of line by the constant hammering of the die 20 against the dies A and B in the operation of the apparatus.

The operation of the apparatus is as follows:—When the dies A and B have gripped a nail blank C, the die carrier is actuated forwardly, thus moving the heading die 20 toward the sides of the dies A and B. As the die orifice in the heading die 20 is arranged to be substantially in line with the nail blank C, the die orifice will inclose the projecting end of the nail blank during the forward actuation of the die carrier, and thereafter the die 20 will contact with the sides of the dies A and B as shown in Fig. 2. At this stage in the operation of the apparatus the die 20 and its sleeve 3 are stationary relatively to the die carrier, but the carrier has not as yet reached the limit of its forward movement and its forward actuation continues while the portion 2 of the carrier slides within the sleeve 3, the spring 16 being compressed between the sleeve and the shank 1 of the die carrier. Simultaneously the heading pin 25, held by the chuck 24 and rod 26, slides forwardly in the bore of the die 20, contacting with the end of the nail blank projecting within the bore or die orifice, upsetting the material of the blank projecting within the orifice and forming the head. The apparatus is then in the position shown in Fig. 3, at the completion of its forward movement and having formed the head upon the blank. The die carrier is then moved backwardly. During the first

portion of such retraction the spring 16 maintains the die 20 in contact with the sides of the dies A and B until the link 12 engages the flange 10 upon the sleeve, when, during the second portion of said retraction, the sleeve and die 20 take up the movement of the die carrier, and the apparatus is soon in starting position and ready to repeat the operation.

10 Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a heading apparatus, a die, a carrier and a sleeve to hold said die and arranged to slide upon the carrier, said sleeve having separately adjustable portions, whereby one portion may be adjusted to fit the carrier and another portion adjusted to hold the die.

20 2. In a heading apparatus, a die, a carrier, a sleeve arranged to hold the die and to slide upon the carrier, said sleeve having separately adjustable end portions whereby one end portion may be adjusted to slide on said carrier and the other end portion may be adjusted to hold the die.

3. In a heading apparatus, a die, a carrier, a sleeve to hold the die and arranged to slide upon the carrier, said sleeve having longitudinal and transverse splits therein, shim pieces in said transverse splits, and means to adjust the sleeve to compensate for

the wear of said carrier and of said sleeve upon each other.

4. In a heading apparatus, a carrier having a longitudinal bore, a sleeve arranged to slide upon the carrier, a die removably attached to the forward end portion of the sleeve, a heading pin extending into the die, a chuck to hold the heading pin, said chuck being fitted into the bore of the carrier, means to adjust the heading pin longitudinally in the chuck, a spring arranged to hold said sleeve and die normally in forward position and means to adjust the sleeve to compensate for the wear of both the carrier and the sleeve upon each other.

5. In a heading apparatus, a die, a carrier, and a sleeve to hold the die and arranged to slide upon the carrier, said sleeve having a longitudinal split in the portion constructed to slide upon the carrier and bearing and tightening screws uniting said split portion whereby the sleeve may be adjusted to fit the carrier and to compensate for the wear of both sleeve and carrier upon each other.

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

MATTHIAS BROCK.

Witnesses:

CHAS. T. CAHILL,
JAMES R. HODDER.