No. 725,068. PATENTED APR. 14, 1903.

J. N. GIFFORD.

KNIFE FOR MACHINES FOR MAKING TACKS OR NAILS.

APPLICATION FILED AUG. 7, 1902.

NO MODEL.

Fig. 1.

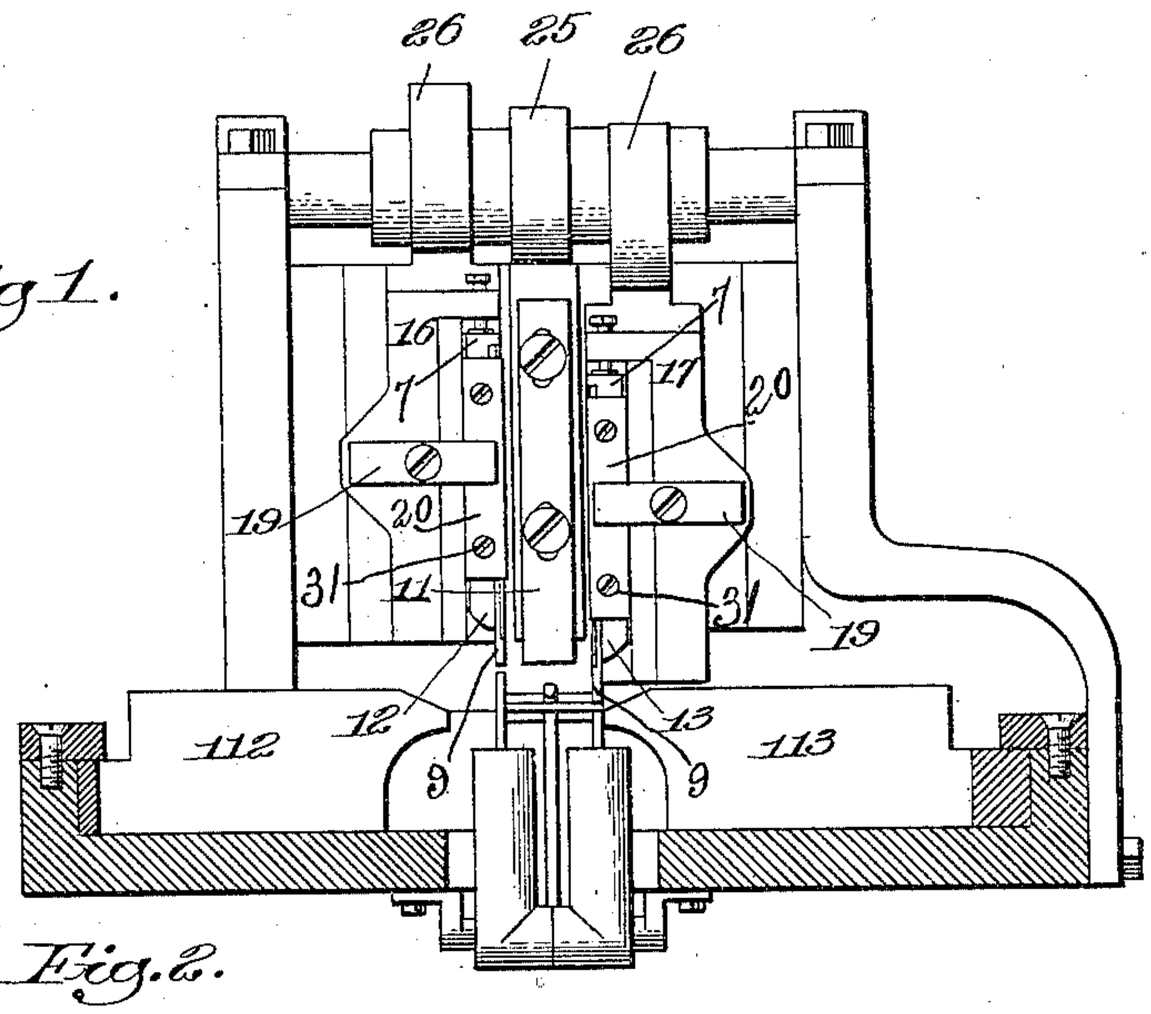


Fig. 2.

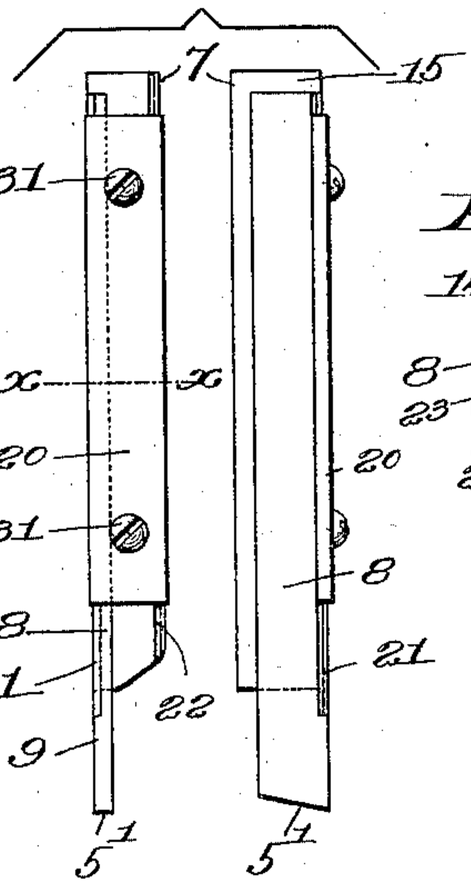


Fig. 3.

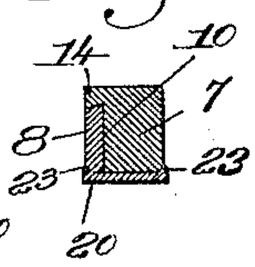
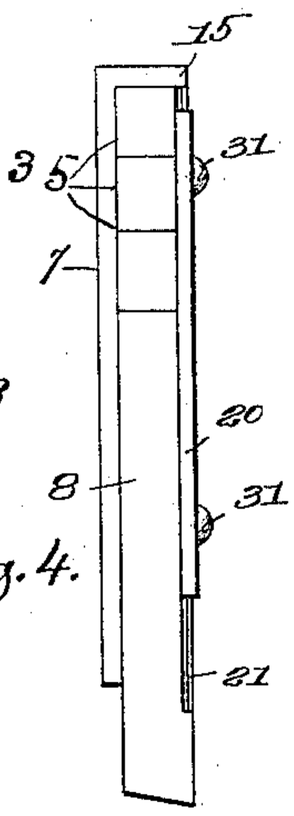


Fig. 4.



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UNITED STATES PATENT OFFICE.

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KNIFE FOR MACHINES FOR MAKING TACKS OR NAILS.

SPECIFICATION forming part of Letters Patent No. 725,068, dated April 14, 1903.

Application filed August 7, 1902. Serial No. 118,709. (No model.)

To all whom it may concern:

Be it known that I, JAMES N. GIFFORD, a citizen of the United States, residing at Fairhaven, county of Bristol, State of Massachusetts, have invented an Improvement in Knives for Machines for Making Tacks or Nails, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to knives which are especially designed to be used in machines for making tacks or nails, one type of which machine is illustrated in my Patent No. 684,364, dated October 9, 1901. The machine described in the said patent includes three reciprocating knives which coöperate with a bed-knife to cut a strip or sheet of metal into tack-blanks. The sheet or strip of metal which is fed to the cutting mechanism is mounted upon an oscillatory or vibrating table, which by its vibration presents the sheet to the cutting mechanism at different angles. The two outside knives of the three have been referred to in the said patent as "leader" knives, and in the operation of the machine the center knife and one leader knife descend to cut a tack-blank from the sheet, and thereafter the center knife is retracted or moved upwardly, while said leader knife continues its downward movement and carries the severed tack-blank into position to be gripped or held between vise-like jaws, which hold the blank while a header operates thereon to make the head upon the tack. While said leader knife is thus carrying the severed tack-blank into position to be operated upon by the header the center knife is being retracted, as stated above, and as the said leader knife begins its upward movement the center knife and the other leader knife descend to sever the next succeeding tack-blank. The last-named leader knife after the tack-blank has been severed continues its downward movement and operates to carry the said severed tack-blank downward below the bed-knife into position to be operated upon by the header mechanism, during which operation the center knife and the first-named leader knife are cutting a third tack-blank. The construction of the machine is such that the cutting edge of the leader knives must of necessity be rather thin in order not to interfere with the operation of the header mechanism. In order, however, to provide the requisite stiffness or rigidity in the leader knives to prevent them from yielding or springing while cutting the blank from the sheet, it is necessary to make the body portion of the knives of considerable size. Accordingly the leader knives in the machine described in said patent were formed by taking a piece of steel having a body portion of sufficient size to furnish the required rigidity and forging one end of said piece of metal to form a comparatively thin cutting-blade, as shown in Figs. 5 and 13 to 16 of said patent, and thereafter tempering the forged portion to the proper degree of hardness. With this form of knife it is obvious that after a certain amount of use and constant grinding to keep the cutting edge sharp the thin forged tempered portion of the knife becomes worn away to such an extent as to bring the thicker body portion thereof into position to interfere with the operation of the header. When this occurs, it is necessary to reforge the end of the knife to form or draw the same into a thin cutting portion and to again temper the cutting portion, as above described. This operation is repeated as necessity requires until by repeated reforgings and consequent shortenings of the stock of the knife it is shortened to such an extent as to make it impossible to properly secure the same in the head of the tack-making machine. When this point is reached, the stock is of no further use as a knife and usually finds its way into the scrap heap. The same is true of the knives in many other types of machines which are now in common use.

It is the object of my invention to provide a novel form of knife, which is adapted to take the place of the leader knives now commonly employed in these tack-machines and which has many advantages thereover.

The knife forming the subject of this invention comprises a body portion or stock, to which is detachably and adjustably secured a strip of steel which has been previously tempered or hardened, and which is provided with a cutting edge, and which for conven-

ience will be hereinafter referred to as a "blade." The strip of steel or blade is secured to the stock of the knife, so that its cutting edge will project a suitable distance beyond the end of the same, and the size and thickness of the blade are approximately the same as those of the reduced cutting end of the knives at present in use. By using a blade which is adjustably secured to the stock, with its cutting end projecting beyond the stock, a knife is produced which has the requisite thinned portion at its cutting end and the requisite stiffness in the body thereof, for the stock or body portion of the knife gives to the same the desired degree of stiffness. Since the strip or blade is adjustably secured to the stock, it follows that as the cutting edge wears away it is simply necessary to adjust the strip or blade on the stock to carry the cutting edge thereof the proper distance below the stock to prevent the latter from interfering with the operation of the header mechanism.

In the drawings, Figure 1 is an elevation of the cutting mechanism of a tack or nail making machine similar in construction to the machine described in my above-mentioned patent, but embodying my improvements. Fig. 2 is a front and side elevation of my improved knife. Fig. 3 is a section on the line *x x*, Fig. 2; and Fig. 4 shows the way in which the cutting strip or blade of the knife is adjusted as it wears.

I have herein for convenience illustrated my improved knife as used in connection with a tack-machine, such as is shown in my above-mentioned patent; but I desire to state that the knife may be employed with any of the tack-making machines now in common use, and the invention is intended to cover a knife having the characteristics hereinafter pointed out, regardless of its use. In the machine illustrated in the said patent the center knife 11 and the leader knives 12 and 13 are capable of independent operation and are reciprocated by the cams 25 and 26. For a more particular description of the construction and mounting of these parts reference is made to the said patent. In the operation of the machine the cams 25 and 26 depress the center knife 11 and the leader knife 13 simultaneously, and said knives cut a tack-blank from the sheet of metal. As the blank is severed the center knife 11 rises, while the leader knife 13 continues its downward movement into the position shown in Fig. 1, thus carrying the severed blank into position to be received by the vise-like holder, while the header 113 moves upward to form the head upon the blank, as more particularly described in said patent. As the leader knife 13 is retracted the leader knife 12 and the center knife are descending to cut a second blank, which when severed is carried downward by the continued downward movement of the leader knife 12 into position to be operated upon by the header 112. It will be observed that in order to prevent the header from striking or interfering with the leader knife it is necessary to make the cutting edge of the leader knife comparatively thin. It would be impracticable, however, to make the stock or body portion of the leader knife as thin as it would be necessary to make the cutting portion, for if this were done the knife would not have the requisite stiffness or rigidity to prevent its yielding or springing, especially when comparatively thick sheets were being cut into blanks. Accordingly, as stated above, the knives have heretofore been made with a comparatively thick heavy stock or body portion which is forged at its cutting end to form the thin portion, on the lower end of which is the cutting edge. In the operation of the machine it is necessary, of course, that the knife be so positioned in the reciprocating head that the thickened body or stock be above or out of the way of the reciprocating header, and hence as the cutting edge wears away it is necessary to reforge or draw out the end of the knives to form a new thinned portion of the requisite length.

My improved knife is illustrated in Figs. 2 and 3, and it comprises a body or stock portion 7 and a blade in the nature of a separate strip of steel or other suitable material 8, which is detachably and adjustably secured to the stock 7. The blade when adjusted has its end 9 projecting sufficiently beyond the stock 7 to form the requisite thinned portion of the knife, and the lower edge of the blade is ground to form the cutting edge 5′. I will preferably support the blade in the stock by providing one side of the stock with a pocket or recess 10 of a size to receive the blade 8, as illustrated in Fig. 3, said recess being formed by the lips or projections 14 and 15 at the back and top of the stock. A clamping member 20, secured to the front of the knife in any suitable way, as by screws 31, operates to adjustably hold the cutting-blade 8 in place. Preferably the exposed corner 21 of the blade and the front corner 22 of the stock will be slightly beveled, (see Fig. 3,) and the clamp member 20 will be provided with beveled lips 23, which fit the beveled portions 21 and 22 and operate to hold the front edge of the cutting portion 8 firmly against the stock. The projection or lip 14 will preferably be undercut slightly, as seen in Fig. 3, and the back side of the blade 8 will be shaped to fit.

From the above it will be apparent that as the screws 31 are tightened the back edge of the cutting strip or blade 8 is crowded into the undercut portion of the lip 14 and the front portion is crowded hard against the stock 7 by the wedging action of the lips 23.

A knife such as I have just described has the requisite stiffness, and yet has its cutting end of the shape necessary to enable it to be used in a tack-making machine. As the cutting edge of the blade 8 wears away through constant use, it is merely necessary to loosen

the clamping member and move the blade downward to cause its cutting edge to project the proper distance beyond the bottom of the stock 7, when by putting a suitable shim or shims 35 between the upper end of the blade 8 and the lip 15 the blade will be held in such position by the clamping member.

The blade 8 may be hardened or tempered to the proper degree throughout its length before it is secured to the stock, and because of the construction herein shown the blade can practically be used entirely up before it is necessary to discard the same. Since the stock or body portion 7 can be used constantly and since it is only necessary to renew the blade 8 as the tool wears and since, further, the blade 8 can be practically used up before it is necessary to discard it, it follows that the amount of material which it is necessary to throw into the scrap heap is very small in my tool as compared with what it has been necessary to waste in the former tools.

In constructing my tool I will preferably employ for the blade 8 a piece of self-hardened steel, commonly known as "Dannemora" steel. This kind of steel requires no tempering and possesses such a hardness, toughness, and fineness as to make it far superior to the best crucible steel which can be produced and especially adapts it for knives that are required to cut iron or soft steel, of which latter most of the tacks are now made. The price, however, of this character of steel is extremely high—so high, in fact, as to practically prohibit its use in the manufacture of the old form of knives. Furthermore, the character of the metal is such that it would be very difficult to forge or draw out the thinned portion in the old style of knife, and the amount of the stock of the knife which it has been heretofore necessary to throw into the scrap heap would render the use of this metal for this old style of knife extremely expensive. With my improved knife, however, the blade 8 can be made of this Dannemora metal, and therefore a superior knife produced at a minimum of expense.

While I have herein described one particular way in which the separate blade 8 may be secured to the stock of the knife, I wish it understood that my invention is not limited to this particular construction, but is intended to be broad enough to include any equivalent manner of connecting the said blade to its stock. Furthermore, my invention is not limited to a knife for use in a tack-making machine; but it is applicable to knives in metal-working machines generally.

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

1. A knife for a tack-making machine, comprising a stock provided with a blade-receiving recess, a blade in said recess, said blade extending below the bottom of the stock and having a cutting edge at its projecting end, the wall at the upper end of said recess projecting over the blade and forming an abutment to take the strain incident to cutting, said strip extending substantially the full length of the stock whereby it operates to hold in position both the blade and any shims which may be inserted between the end of the blade and the upper wall of the recess as the blade wears.

2. A knife for a tack-making machine, comprising a stock having one side rabbeted to form a blade-receiving pocket, a blade in said pocket, and a clamp secured to the front of the stock and having lips to engage both the exposed corner of the blade and the front exposed corner of the stock, said stock having a shoulder projecting over the upper end of the blade and serving as a bearing to take the longitudinal thrust incident to cutting.

3. In a knife for a tack-making machine, a stock adapted to be detachably carried by said machine and having a flange or rib projecting from one side at its back and top, a blade resting against the flange at the back of the stock, and a clamp on the front of the stock adapted to partially embrace the front of the blade, the blade extending below the bottom of the stock, and the flange at the top of the stock operating to take the thrust on the blade incident to cutting.

4. In a knife for a tack-making machine, a stock having one side rabbeted to form a blade-receiving pocket, a blade in said pocket, the front exposed corners of the blade and stock respectively being beveled, and a clamping member secured to the front of the stock and having beveled lips to engage said beveled exposed corners, said stock having a shoulder projecting over the end of the plate and serving as an abutment to take the longitudinal thrust incidental to cutting.

5. A knife for a tack-machine comprising a stock adapted to be detachably carried by said machine and having a pocket in its side, a blade in said pocket, the upper end of said pocket being formed with a wall which projects over the end of the blade and operates to take the thrust incident to cutting, the exposed corner of the strip and one corner of the stock being beveled and a clamp-strip extending substantially the whole length of the stock and having lips to engage said beveled portions, said clamping-strip operating to hold both the blade in place and also any shims which may be inserted between the end of the blade and the upper wall of the pocket.

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

JAMES N. GIFFORD.

Witnesses:
JOB C. TRIPP,
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