April 11, 1933. H. KRUSE 1,903,700

NAILING MACHINE

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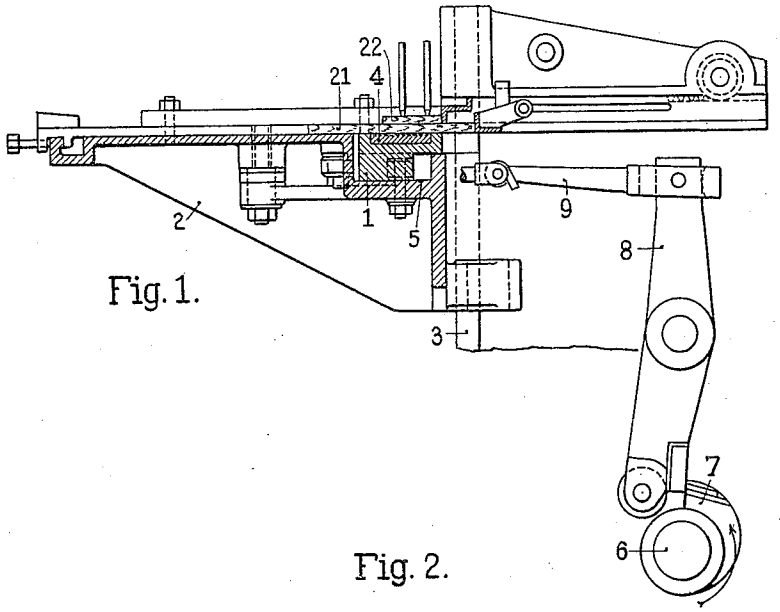
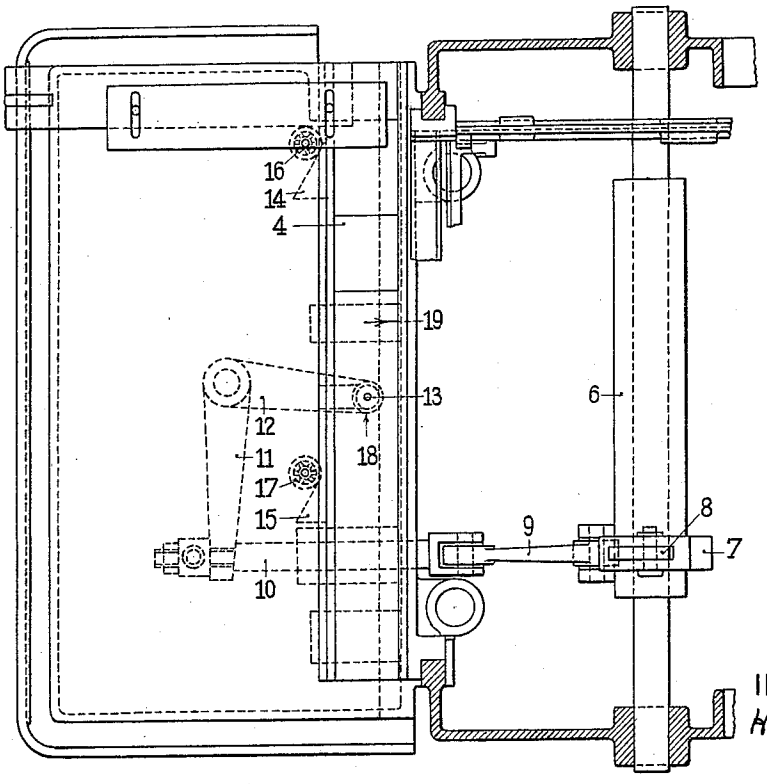


Fig. 1.

Fig. 2.



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Fig. 3.

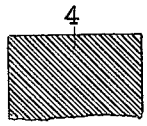


Fig. 4.



Fig. 4a.



Fig. 5.

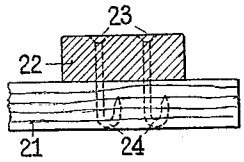


Fig. 6.

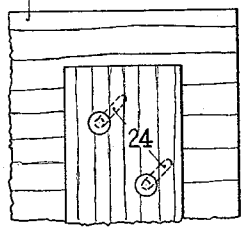
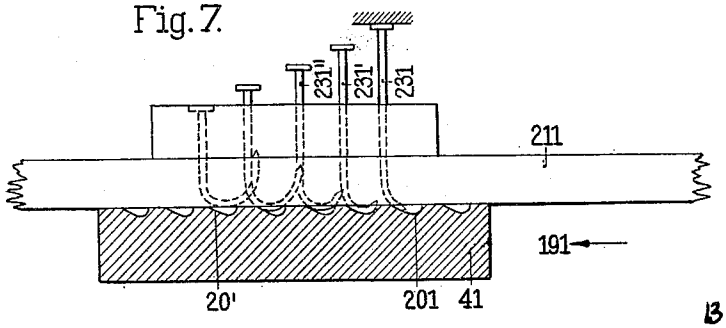


Fig. 7.



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UNITED STATES PATENT OFFICE

HERMANN KRUSE, OF BREMEN-SEBALDSBRUCK, GERMANY

NAILING MACHINE

Application filed July 8, 1930, Serial No. 466,548, and in Germany July 22, 1929.

My invention relates to improvements in nailing machines, and more particularly in devices used in such machines for bending the points of the nails after hammering the same through the wood. More particularly my invention relates to machines of the type in which a slide is provided on its top face with grooves for bending the points of the nails and forcing the same into the wood, said slide being moved while nailing transversely of the nail. The object of the improvements is to provide a device of this type by means of which the points or ends of the nail are bent without causing splitting of the wood, and with this object in view my invention consists in moving the slide engaging the points of the nails with its grooves in a direction at an acute angle to the grain of the wood, the grooves being preferably disposed angularly of the grain of the wood.

Another object of the improvements is to provide a machine by means of which nails of different lengths the points of which engage the grooved plate at different points may be regularly bent by means of the same slide, and with this object in view my invention consists in providing the grooves of the plate with bending faces which are slightly inclined relatively to the direction of the movement of the slide. Therefore when the point of a nail forced through the wood leaves the same it engages the said inclined face of one of the grooves of the slide, and it is therefore uniformly bent by the pressure of the hammer acting on the nail and by reason of the small angle of the inclined side face of the groove.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawings in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawings

Fig. 1 is a sectional elevation showing a part of a nailing machine and the bending device carried thereby,

Fig. 2 is a top plan view of Fig. 1 partly in section,

Fig. 3 is a plan view on an enlarged scale showing the grooved plate for bending the points of the nails,

Fig. 4 is a sectional elevation taken on the line 4—4 of Fig. 3,

Fig. 4*a* is a sectional elevation on an enlarged scale showing the top part of the plate shown in Figs. 3 and 4 and one of the grooves formed therein,

Fig. 5 is a sectional elevation on an enlarged scale showing a board having a cleat nailed thereto,

Fig. 6 is a top plan view of Fig. 5, and

Fig. 7 is a diagrammatical sectional elevation showing a modification of the grooved plate and illustrating the method of bending the points of the nails.

The nailing machine provided with my improved bending device may have any known or preferred construction and in the figures I have shown only the frame 3 of the said nailing machine and the device for bending the ends of the nails mounted thereon. On the said frame 3 a table 2 is mounted which is provided with a guide way 5 having an elongated slide 1 movable therein. In the said slide 1 a plate or anvil 4 is embedded the top face of which is formed with grooves 20 disposed at an angle of 45° relatively to the direction of the movement of the slide 1 within the guide way 5.

The slide 1 is adapted to be moved within the guide way 5 from the driving shaft 6 of the machine through the intermediary of a lever 8 engaged by a rotary cam 7, a link 9 jointed to said lever and to a slide rod 10, and a bell crank lever 11, 12 engaging in a transverse slot 13 of the slide 1. To the said slide two bevelled cam members 14 and 15 are secured which are engaged by rollers 16 and 17 adapted to shift the slide transversely of the direction of the movement imparted thereto by the bell crank lever 11, 12. The movements thus imparted to the slide have been indicated in Fig. 2 by the arrows 18 and 19.

The shape of the grooves 20 and the side walls thereof is best shown in Fig. 4*a*.

Figs. 5 and 6 show a board 21 having a cleat 22 fixed thereto by means of nails 23 having their ends 24 bent into the board 21. As appears from Fig. 6 the said ends 24 have

been bent at an acute angle to the grain of the wood.

In the operation of the machine the boards 22 and 21 are placed on the table 2 and the machine is started for driving nails through the said boards. By the movement of the machine the slide 1 carrying the anvil 4 is moved in the direction of the arrow 18 and by reason of the bevelled cam members it is simultaneously moved in the direction of the arrow 19, the said movements being combined into a movement directed at an angle of about 45° to the grain of the wood. Thus the grooves 4 which are likewise disposed at an angle of 45° to the grain of the wood bend the ends of the nails at the angle shown in Fig. 6.

In Fig. 7 the anvil formed with grooves for bending the ends of the nails has received the character 41, and it is adapted to be moved in the direction of the arrow 191. The grooves 201 of the anvil are provided with walls 20′ which are slightly inclined relatively to the direction of the movement of the anvil.

The action of the said grooves on the points of a nail driven through the boards 221 and 211 by means of the hammer has been illustrated in the said figure by assuming the nail 231 to be movable relatively to the anvil 41 as has been indicated by the reference characters 231, 231′ and 231″, said nails being assumed to be moved in a direction opposite to the arrow 191. The figure shows that by moving the nail in the said direction its end is gradually bent and driven into the wood.

While in describing the invention reference has been made to a particular example embodying the same I wish it to be understood that my invention is not limited to the construction shown in the drawings and that various changes may be made in the general arrangement of the apparatus and the construction of its parts without departing from the invention, for example the anvil 4 may be made integral with the slide 1.

I claim:

1. The combination with a nailing machine provided with means for placing wood to be nailed thereon, of mechanism for bending the end of a nail driven through a board comprising an anvil adapted to engage the ends of the nails driven through the wood and to bend the same, means for moving said anvil in a direction parallel to the length of the board, and means for slightly moving the anvil transversely of the said direction.

2. The combination with a nailing machine provided with means for placing wood thereon to be nailed, of mechanism for bending the end of the nail driven through the wood, comprising a movable anvil adapted to engage the ends of the nails driven through the wood and to bend the same, said anvil being formed with grooves having side walls slightly inclined relatively to the direction of the movement thereof.

In testimony whereof I hereunto affix my signature.

HERMANN KRUSE.