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METHOD OF MAKING COPPER COATED NAIL  
FROM COPPER COATED ROD STOCK  
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2,718,647

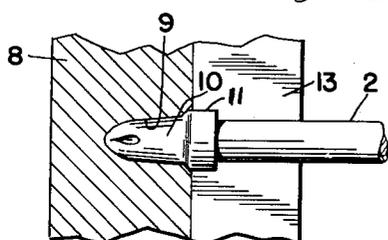
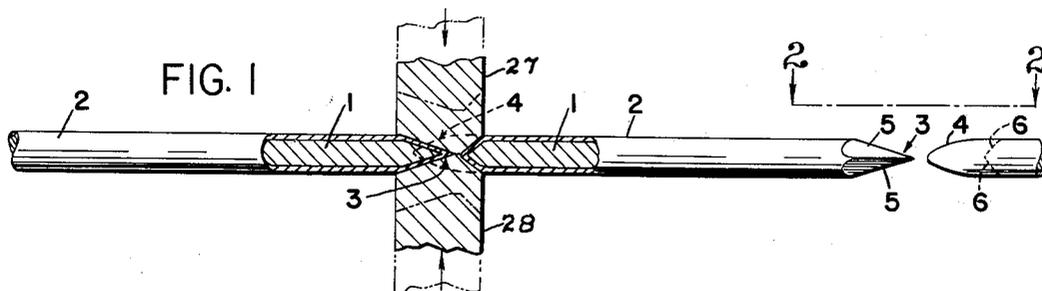


FIG. 3

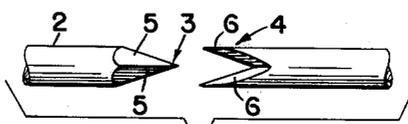


FIG. 2

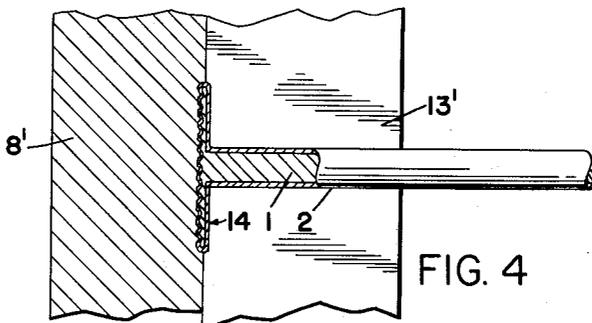


FIG. 4

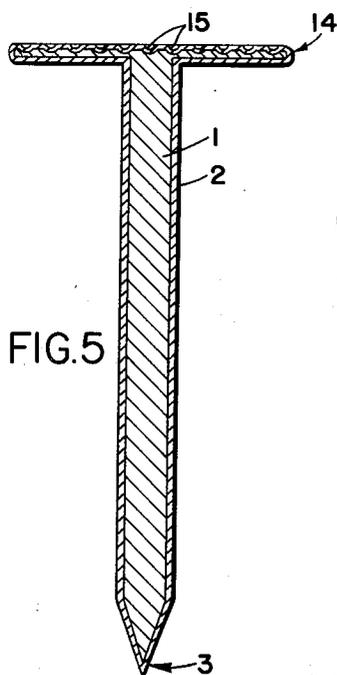


FIG. 5

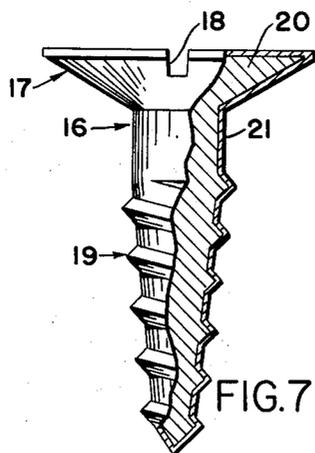


FIG. 7

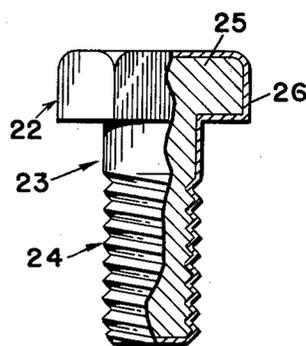


FIG. 8

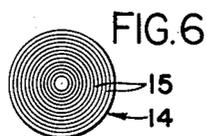


FIG. 6

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**METHOD OF MAKING COPPER COATED NAIL  
FROM COPPER COATED ROD STOCK**

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1 Claim. (Cl. 10—54)

This invention relates in general to fastening devices and more particularly to improvements in headed rigid driving fastening devices, such as nails, screws, bolts, tacks, and the like, and the fabrication thereof.

In the U. S. patent to Wikschrom, No. 1,014,732, dated January 16, 1912, is disclosed a machine and a method of making wire nails out of a continuous strip of stock. The machine and method contemplates the feeding of the stock into position for a cutting operation by a die cutter which not only pierces the wire stock, but also forms a penetrating point for one rigid driving nail, while leaving the section of stock in front of this point with a bifurcated end. The next succeeding cut of the wire stock leaves the other end of this pointed wire nail section with a bifurcated opposite end. The next operation on this nail section is the application of a coned pressure block to form the bifurcated end into a cone, after which a flat surface pressure block flattens out the cone into a finished nail head. By such a process of wire nail manufacture, nails can be produced without any loss or waste of the wire stock.

It is a well known fact that in various types of carpentry, serious disadvantages arise out of the use of headed rigid driving fastening devices made out of metals that are subject to corrosion. It is a common occurrence to find in buildings that require protective paint covering that the paint covering is still adequate for protection of the exterior of the building, but has become defaced by reason of corrosion of the fastening devices, resulting in rust streaks on the outer surface of the painted structure. Moreover, such corrosive material fastening devices also become so corroded as to lose their effectiveness for their intended purpose.

Thought has been given to the idea of using such headed rigid driving fastening devices that are made completely of such non-corrosive metal as copper, aluminum, or the like, to avoid the foregoing disadvantages. This has been found to be impractical because of the lack of rigidity and tensile strength of the non-corrosive metal employed to produce a useful rigid driving fastening element.

Others have suggested the possibility of completely forming driving fastening devices of relatively rigid metal and the subsequent subjecting of the finished fastening devices to a plating or coating process resulting in a relatively thin coating of less rigid non-corrosive metal. This usually results in an inadequate protective coating for the rigid driving fastening device and, at best, it entails a separate and costly step in the manufacture of finished product.

It is therefore one of the primary objects of my invention to provide headed rigid driving fastening devices, such as nails, screws, tacks, bolts, and the like, of the rigid metal inner core to enable it to be used as a driving fastening device, and that is completely enveloped by a substantial and relatively thick jacket of a non-corrosive metal.

It is an equally important object of my invention to provide a method of manufacture of such headed rigid driving fastening devices which includes the use of a long continuous wire stock of rigid metal that is enveloped in a substantial relatively thick jacket of non-corrosive metal and the cutting of this jacketed wire stock at spaced points to form nail sections, and the forming of the penetrating point, shank and head of each fastening device without any loss or waste of the core metal or of the jacket metal so that the complete fastening device is completely jacketed with non-corrosive metal without the necessity of subjecting it to any further plating or coating operation.

With the foregoing and other objects in view, the invention resides in the combination of parts, the details of construction and the method of fabrication, as hereinafter set forth in the following specification and appended claim, certain embodiments being illustrated in the accompanying drawings in which:

Figure 1 is a schematic view, partly in side elevation and partly in cross section, of a strip of metallic wire stock having a rigid metallic core and a heavy jacket of non-corrosive metal thereon, showing a die cutter swedging the stock, including the core and jacket to a penetrating point and severing the jacketed stock at this point in its length and also showing the stock severed at another point in its length to form a penetrating pointed end and a complementary bifurcated end formed by the die swedging and cutting operation;

Figure 2 is a view in section, taken along line 2—2 of Figure 1, showing two fragmentary sections of the jacketed stock, one with a pointed end and the other with a bifurcated end formed by the die swedging and cutting operation;

Figure 3 is a schematic view, showing a pair of blocks, one for holding the bifurcated end of the jacketed stock and the other block being shown in section as having a special recess therein to form the bifurcated end of the jacketed stock in to a coned end;

Figure 4 is a similar view, showing a pair of blocks to form the coned end of Figure 3 in to a jacketed flattened nail head;

Figure 5 is a view in longitudinal section taken through a completed rigid driving nail, showing the same to have a core of rigid metal, completely jacketed in a thick layer of non-corrosive metal;

Figure 6 is a view in top plan of the head of the rigid driving nail, showing the same to be formed with a series of concentric grooves for non-skid and paint retaining purposes;

Figure 7 is a view partly in side elevation and partly in longitudinal section taken through a completed headed rigid driving screw, showing the same to be formed of a core of rigid metal completely jacketed in a heavy layer of non-corrosive metal; and

Figure 8 is a similar view of a headed rigid driving screw bolt, showing the same to be formed of a core of rigid metal completely jacketed in a thick layer of non-corrosive metal.

In Figure 1, I have shown two opposed die and swedging cutters 27 and 28 in position to have uniformly swedged the core and jacket of the jacketed stock to a pointed end and to have severed the jacketed wire stock at this point to form a penetrating point 3 and a complementary bifurcated end 4. To the right of the two die swedging cutters in Figure 1, and also in Figure 2, I have shown the jacketed pointed end 3 to include tapered side faces 5 and the jacketed bifurcated end 4 to include complementary tapered faces 6.

Aside from working the non-corrosive metal jacket 2 to insure that it completely envelopes the pointed end, no further operation, such as a subsequent coating operation,

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is necessary to complete the pointed end of the fastening device.

In carrying out my purpose to avoid any waste of the stock material, as well as to insure that the completed rigid driving fastening device is completely enveloped in a non-corrosive metal jacket, my next step in my process is to work the bifurcated end 4 into a flattened head. This entails the intermediate step of forming the bifurcated end into a substantially conical form. Such a step is illustrated in Figure 3, in which I employ a chuck 13 for holding the fastening device and a punch 8 having a conical recess 9 in its forward face. This results in the formation of the bifurcated end into an end that has a conical portion 10 and a cylindrical portion 11, as illustrated in Figure 3. Care is taken not only to insure that the end is so formed but also to insure an equal and even distribution of the non-corrosive metal jacket.

The next step is to hold the rigid driving nail in chuck 13' bring another portion 8' of the punch having a substantially flat surface, as compared to the conical recess 9. Such a punching operation is illustrated in Figure 4, wherein the coned shaped end 10 and 11 is changed into an enlarged circular flattened head 14.

A refinement of this operation that is illustrated in Figure 4. Here, I may provide this relatively flat surface of the punch 8' with concentric grooves in order to produce a nail head with concentric grooves such as shown in Figures 5 and 6 at 15. The purpose of this concentric groove formation on the nail head is two-fold. It provides a protection against slipping or skidding of the hammer when applied to the nail for fastening purposes. In addition, it serves as a means to retain paint that is applied as an ornamental measure and as a protection against the weather.

By reference to Figure 5, it will be seen that the complete rigid driving fastening device, including its pointed end, its shank and flattened head, comprises a core 1 of relatively rigid metal to insure its durability, while being completely enveloped in a jacket of non-corrosive metal 2 of appreciable thickness.

As hereinabove stated, I am primarily concerned with headed rigid driving fastening devices, whether they be nails, tacks, screws, bolts, or the like. Regardless of the nature of the fastening device, I employ the same general fundamentals, namely to avoid waste of the wire stock material, which is a wire stock having a core of relatively rigid metal enveloped in a thick jacket of non-corrosive metal. Moreover, by using the non-corrosive metal of the jacket of the stock, I am able to produce the fastening device in its completed form with a non-corrosive metal jacket that completely envelopes the entire rigid driving fastening device.

Merely as an illustration, I have shown in Figure 7, a completed rigid driving screw having a shank 16, spiral screw threads 19, a head 17 and a screw driver slot 18 formed with a core 20 of relatively rigid metal and a jacket 21 of noncorrosive metal of appreciable thickness.

Likewise, in Figure 8, I have shown a headed rigid driving screw bolt, having a shank 23, spiral screw threads 24 and an angular head 22, all formed with a core 25 of relatively rigid metal completely enveloped by a jacket 26 of non-corrosive metal of appreciable thickness.

From the foregoing, it will be seen that I have provided a new and novel method of making a headed rigid driving fastening device having a core of relatively rigid ferrous metal for purposes of durability and driving through the

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objects to be fastened and that is completely enveloped in a relatively thick jacket of non-corrosive copper metal for rust-resisting purposes. Moreover, this complete operation involves absolutely no waste of the stock which consists solely in a core of relatively rigid metal completely encased in a thick jacket of non-corrosive metal. The swedging of the core and jacket of the jacketed stock to a point and the cutting and stamping operations, the formation of the pointed end of the nail, the coning operation of the complementary bifurcated end and its subsequent flattening to produce the concentric groove formation of the head, are all performed with care to insure an equal and even distribution of the non-corrosive metal jacket around the completed fastening device, including its head, shank and its other rigid penetrating other end. Even more important, however, is the point that I have found that by using such a process in conjunction with my type of stock that includes a core of relatively rigid metal and a thick jacket of non-corrosive metal, there is available, within the stock itself, sufficient non-corrosive metal to insure the complete, even and equal distribution of the thick non-corrosive metal jacket around the completed article. This eliminates the necessity of a subsequent and individual plating operation for each fastening device that appears to be the present process employed in providing rigid driving fastening devices with coatings of non-corrosive metal.

I claim:

The method of fabrication of a rigid driving headed fastening nail out of a length of stock having a core of rigid ferrous metal that is embedded in a coating of non-corrosive copper metal of appreciable thickness, which consists in subjecting a given portion in the length of said coated stock to the progressive action of compressive forces by a pair of opposed dies, said forces acting progressively outwardly from a point intermediate of said portion to compress said portion while maintaining the coated stock on opposite sides of said portion free of confinement to allow axial movement of the stock and thus maintain the original cross sectional diameter of the stock, while maintaining a uniform thickness of said coating at the compressed position, and the severing of the coated stock at the thus compressed portion of least cross sectional diameter to produce a coated rigid driving penetrating pointed end for said rigid fastening nail and the subsequent repetition of this operation on the coated stock at a spaced point in its length to provide a coated rigid driving penetrating pointed end for a succeeding rigid fastening nail with a bifurcated end opposite the last-named rigid pointed end, coning said bifurcated end and subsequently flattening said cone to produce a head, the forming of the entire nail, including its head, its shank and its pointed end involving the working of the ferrous metal core and its copper metal coating in such a manner that the ferrous core of the entire nail is completely jacketed by the original copper coating all without loss of metal of the core or the coating of the stock and with the coating of the formed pointed end being maintained at substantially the same thickness as the original coating of the stock.

#### References Cited in the file of this patent

#### UNITED STATES PATENTS

1,014,732	Wikschtrom	Jan. 16, 1912
1,027,240	Clement	May 21, 1912