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PROCESS OF HOLLOW STAY BOLT MANUFACTURING

Original Filed March 7, 1925

Fig. 1.

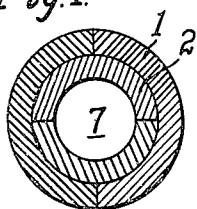


Fig. 2.

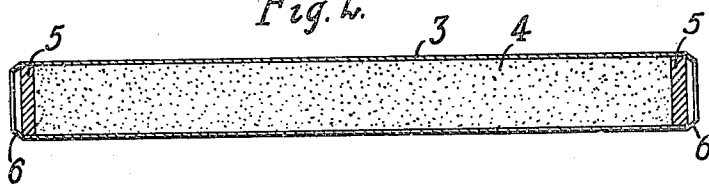


Fig. 3.

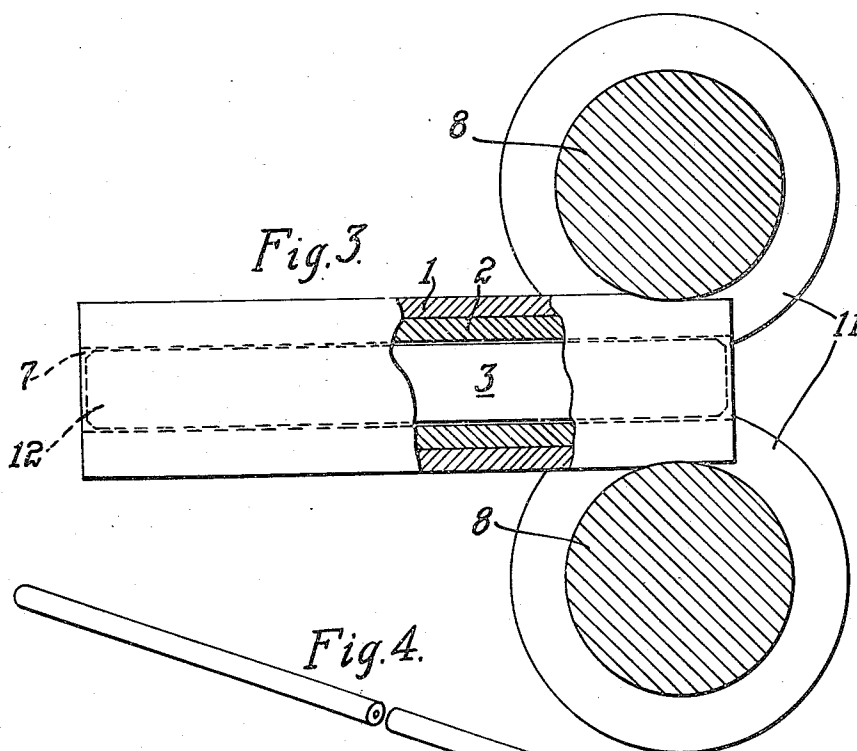
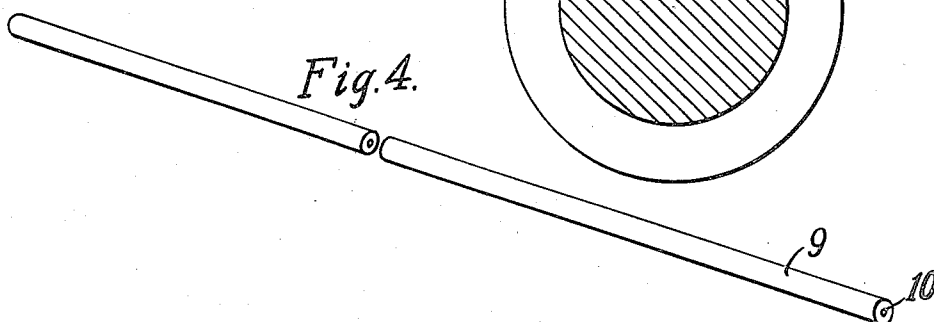


Fig. 4.



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PROCESS OF HOLLOW STAY-BOLT MANUFACTURING.

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This invention relates to the use of a new principle in the process of rolling hollow staybolt or other iron hollow bars and has for its objects the rolling of hollow bars commercially seamless in structure and considerably more economically than the present practice.

Referring to the accompanying drawings, in Figure 1 I show a hollow iron pile, consisting of layers of curved sections snugly nested together in the fashion of a tube with relatively thick wall. Figure 2 shows a tube or container filled with a refractory material. Figure 3 illustrates the manner of entering the said hollow pile into the rolls of a rolling mill; Figure 4 shows a finished hollow staybolt bar.

In constructing the hollow pile I first arrange two semi-tubular sections 2 together, which constitutes the inner layer of the pile and which is then enveloped with outer layers 1, the inner and outer layers so co-arranged that the joints are broken. The hollow pile thus formed is put in a heating furnace and brought to welding heat. Preferably, I thus heat the pile without inserting any core on the inside, first because it exposes a greater surface which hastens the heating and saves fuel, and secondly because it obviates the subjection of a core substance to the severe action of the heat. At welding temperature the pile is drawn from the furnace, and a core is inserted into the hollow center or hole 7. This core may be a stick of solidified carbon, sand, fireclay, or other refractory material, or may consist of a tubular container 3 filled with sand 4 or other refractory material, plugged at the ends 5, the plugs held securely by peening over the projecting edges 6 of the container 3; and thus in place within the pile as indicated at 12 in Figure 3, the hot pile is entered through rolls 8 for the initial reduction pass, which passage through the rolls not only welds the mass of incandescent iron into an integral mass but also squeezes in upon the core holding it securely in place. The pile thus becomes a cored billet and the reduction through gradually smaller passes of the rolls is continued until the bar is reduced to the proper diameter for hollow staybolts, as at 9 of Figure 4, with core extremely reduced in cross section as at 10. In Figure 3 the

numerals 11 indicate the collars of the rolls 8.

In the case of heating the pile with the core inside, I prefer to employ carbon. But preferably, I heat the pile first, then after taking out of the furnace or approximately at that time, I insert the tube containing the core, after which the whole is passed through the reducing rolls. Inasmuch as the hot iron starts to chill as soon as drawn from the furnace, the temperature of it at the time of inserting the core is sufficiently low that the core substance is unaffected, reactions of no kind occurring. It is then easier to extract the core from the finished bar, which may be done by any known method, as drilling, reaming, or by using air or water pressure.

I can also alter the process somewhat by using a pierced or drilled iron billet instead of the hollow pile, but using the main principle hereof of inserting a relatively cold core into the billet after the latter has been heated and drawn from the furnace.

It is obvious that other refractory materials may be resorted to and still remain within the scope hereof, such as graphite, plumbago, siloxicon, lampblack, fireclay, etc.

Having thus described the process what I claim is:

1. The process of making hollow staybolt bars which consists in heating a hollow billet to rolling temperature, then inserting a refractory core in said billet, reducing said billet to the dimensions of staybolt iron, and extracting said core after said reducing operation.

2. The process of making hollow staybolt bars which consists in heating a hollow billet to rolling temperature, inserting a refractory core in said billet, rolling said billet to the dimensions of staybolt iron, and extracting said core after said rolling operation.

3. The process of making hollow staybolt bars which consists in providing a hollow pile composed of a plurality of arcuate sections, heating said pile to welding temperature, then inserting a tube containing refractory material in said pile, rolling said pile to the dimensions of staybolt iron, and extracting said refractory material.

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