Jan. 14, 1958 A. CALMES ET AL 2,819,790

PROCESS FOR THE MANUFACTURE OF SEAMLESS TUBES BY THE THRUST BENCH METHOD FROM OPEN AND PERFORATED BLANKS

Filed Jan. 7, 1953 2 Sheets-Sheet 1

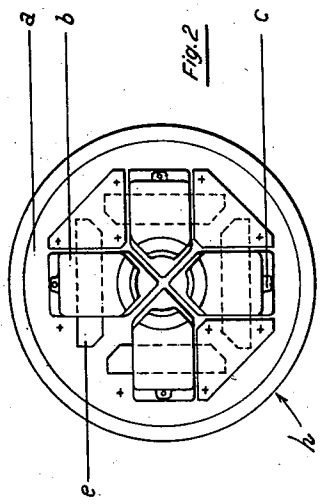


Fig. 2

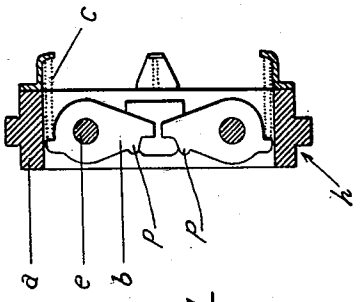


Fig. 1

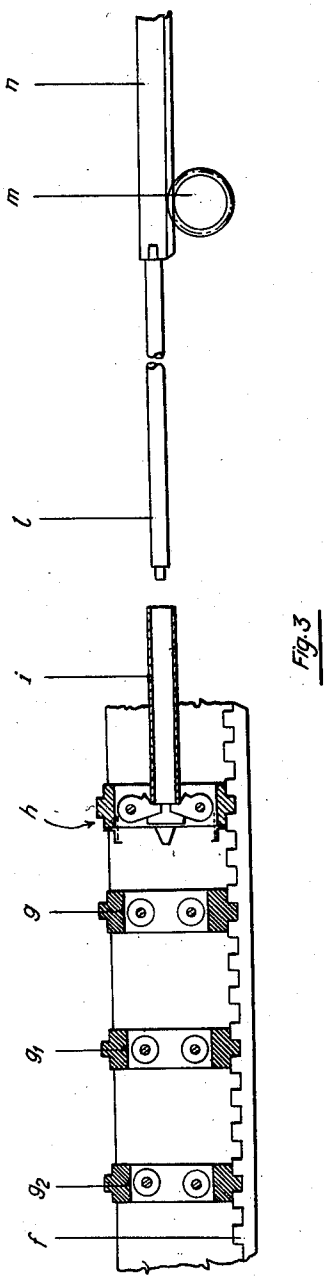


Fig. 3

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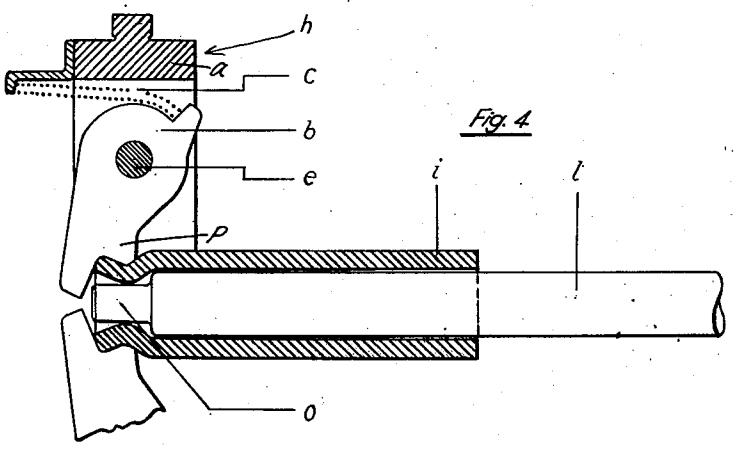


Fig. 4

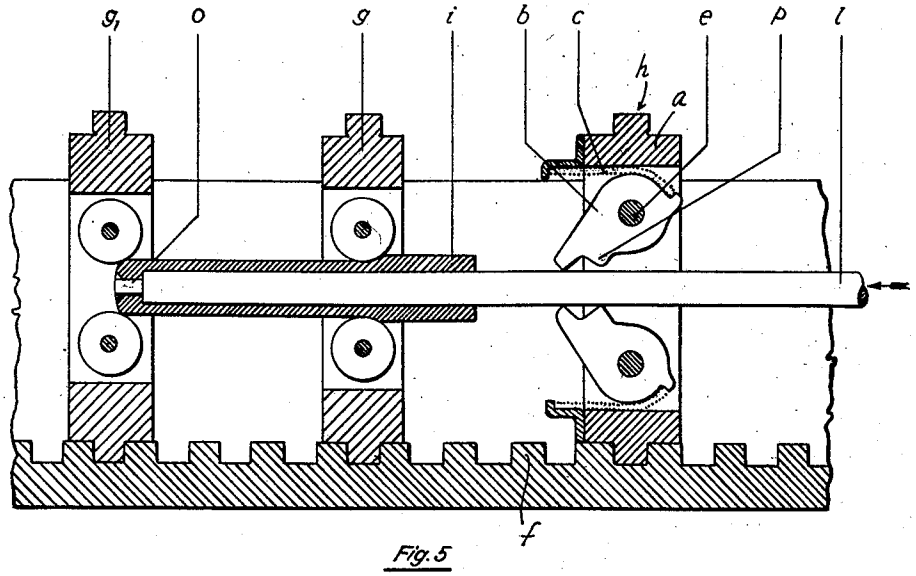


Fig. 5

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PROCESS FOR THE MANUFACTURE OF SEAMLESS TUBES BY THE THRUST BENCH METHOD FROM OPEN AND PERFORATED BLANKS

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Application January 7, 1953, Serial No. 329,958

Claims priority, application Germany January 9, 1952

1 Claim. (Cl. 205—4)

This invention relates to the manufacture of seamless tubes. More particularly, the present invention relates to the manufacture of tubes by the method of the thrust bench. According to the present invention the constriction of the front part of the perforated blank, that is to serve as a rest for the thrust mandrel, is automatically effected at the beginning of the thrust operation.

It is known that in the manufacture of seamless tubes by the thrust bench process there are employed, as row material, billets having a mostly square section, that are transformed by axial punching at the press into hollow cylindrical bodies closed at one end. The thrust bench mandrel, to which a propulsion movement is given by the driving organs, acts upon the closed bottom and drags the hollow body, the so-called blank, through a series of ring dies that progressively reduce its outer diameter elongating it up to the point of transforming it into a thin walled tube. Further, the drawing dies can be replaced by idle roller reduction gauges, operating on the outer diameter of the blank as the rollers of a rolling mill. It is also known that one of the drawbacks of such a system consists in the fact that the length of the punch employed for the perforation is dependent on its diameter, for instance, the length thereof should not be greater than five times the diameter. If this rule is not followed, and also by reason of irregularities of temperature of the billet, the end of the punch easily deviates from its axis with the consequence that the blanks and the tubes obtained are eccentric. As a consequence, the tubes made by the thrust bench process have mostly limited lengths and are, anyhow, shorter than tubes manufactured by other processes.

In order to obviate such drawbacks the method has been proposed of lengthening the blanks coming from the press by means of suitable lengthening rolling mills capable of correcting the unevennesses of thickness.

Another known method consists in the use of hollow bodies with a through hole obtained by means of a perforating oblique mill. One end of these bodies is closed or constricted by means of special apparatus outside of the thrust bench, before these bodies are submitted to the thrust action of the mandrel. The latter process presents the drawback that since the constricting or closing of one end is effected as a supplementary operation between the perforating mill and the thrust bench, it requires a certain length of time and causes the blanks to lose a precious amount of heat.

It is an object of the present invention to make it possible to employ blanks having a through hole, preferably coming from an elongating-equalizing mill, with the particularity that the end constriction that is to constitute the rest point, in order that a thrust bench mandrel may force the blank through the ring dies or reducing rolls, is obtained on the bench by suitably taking advantage of the propulsion action impressed upon the mandrel for stretching the blank and transforming it into a tube and this without requiring a supplementary operation. Thus, it is possible to use on the thrust bench blanks perforated at both ends and having a perfectly uniform thickness due to the equalizing action of the lengthening mill over the whole length of the blank. Besides this advantage an appreciable reduction in the scrap due to the reject of the solid bottom end is obtained.

The following description and the figures of the annexed drawings illustrate by way of example a practical embodiment of the invention.

Figs. 1 and 2 represent a vertical section and a front view of the apparatus which is fixed to the front of the anchoring bed of the thrust bench.

Figs. 3, 4 and 5 illustrate the working of the apparatus.

An assembly *h* shown in Figs. 1 and 2 includes the connecting cage or crown *a* for the four arms *b* that are kept adjacent one another, as shown in the figures, by springs *c* and that can swing around pin *e* by overcoming the resistance of said springs.

In Fig. 3 the anchoring bed of the bench is indicated by *f*, the ring dies or reduction rollers by *g*, g_1, g_2; *h* represents the assembly described above, *i* the blank, *l* the thrust bench mandrel in its starting position, *m*, *n* the propelling organs of the thrust bench, i. e. the driving pinion and rack, respectively. By driving pinion *m*, rack *n* advances and presses the mandrel into the blank *i*; when the end *o* of the mandrel (see Fig. 4) comes into contact with the four arms *b* and causes them to swing and the four noses *p* are pressed into the end of the blank clamping it to the forward end of the mendrel, thus constituting a frontal surface upon which said mandrel can exert its pushing action through the rollers or reducing dies as illustrated in Fig. 5. After the passage of the blank and of the mandrel through the constricting apparatus, arms *b* are returned to the starting position by springs *c*. The number of arms *b* can be varied at will.

What we claim is:

In a tube drawing apparatus, in combination, a mandrel having a leading front end prtion of reduced cross section; means for moving said mandrel in axial direction along a predetermined path; supporting means arranged along said path; constricting means mounted on said supporting means adjacent to said path and adapted to force the leading front end portion of a tube carried by said mandrel against the reduced leading front end portion thereof so that the front end portion of said tube firmly engages the leading front end portion of the mandrel, permitting transportation of said tube along said path solely by movement of said mandrel along said path, said constricting means being shaped and mounted on said supporting means so as to automatically engage the leading front end portion of the tube, constrict the same and move out of the path of said tube when said mandrel with said tube thereon passes through said constricting means; and rotatable tube drawing means mounted on said supporting means along the path of said mandrel and in direction of movement of said mandrel after said constricting means so as to reduce the wall thickness of the tube while the same is transported by said mandrel solely held thereon by the constricted front end portion thereof formed by said constricting means.

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