Aug. 4, 1936. S. FINDLATER 2,050,049

GUIDE DEVICE

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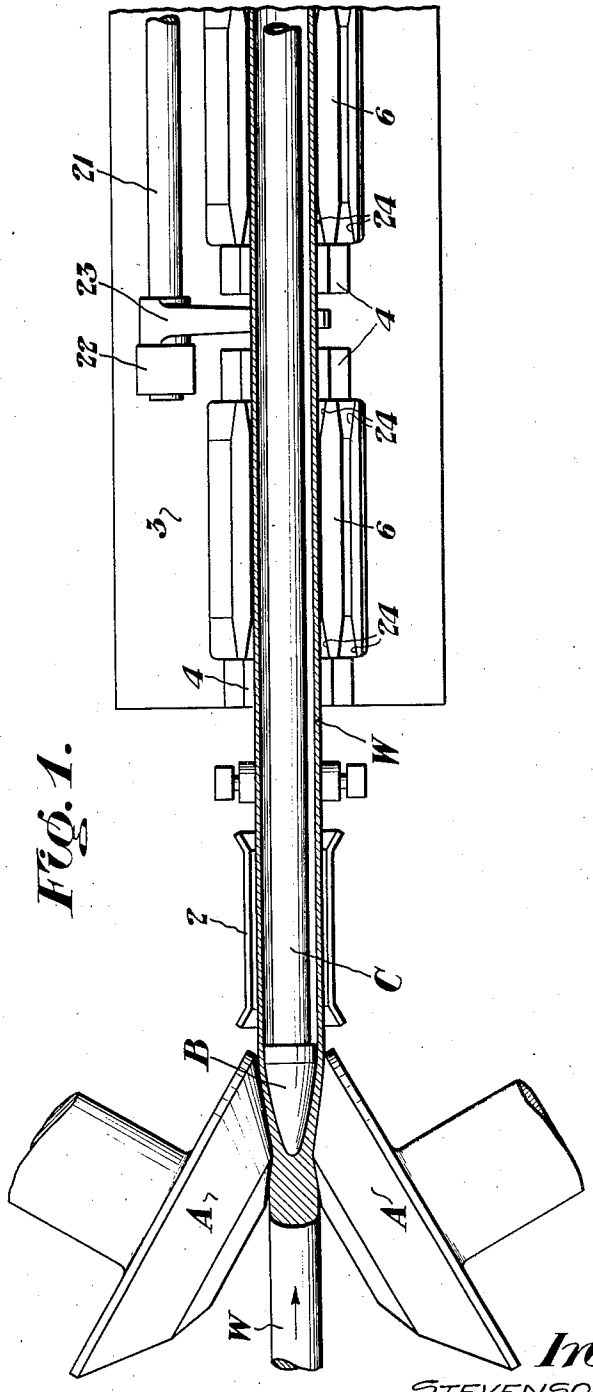


Fig. 1.

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Fig. 2.

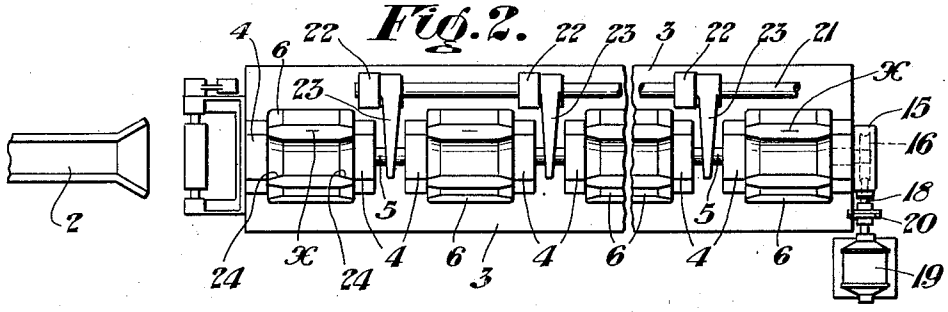


Fig. 3.

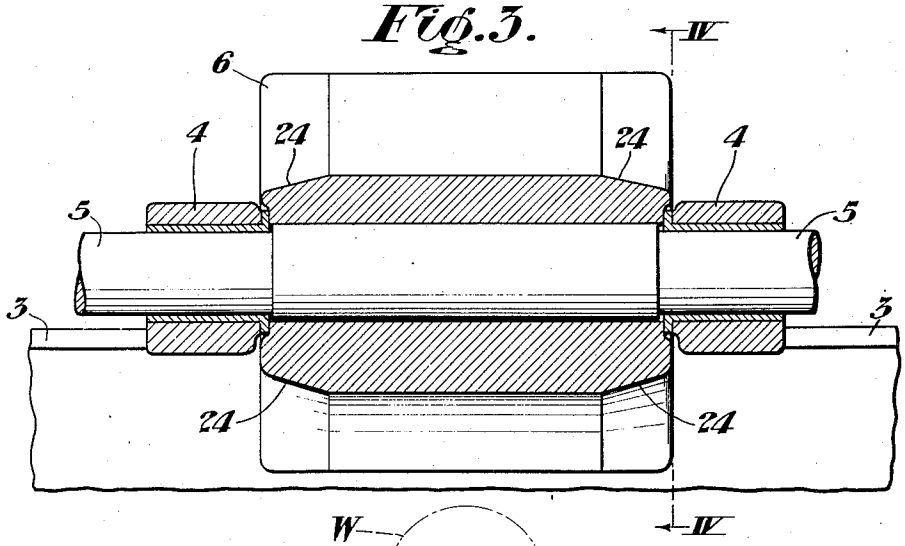
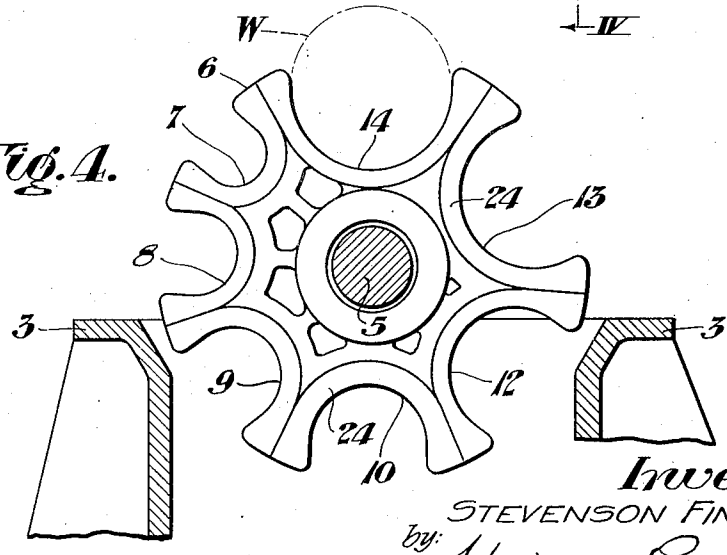


Fig. 4.



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UNITED STATES PATENT OFFICE

2,050,049

GUIDE DEVICE

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Application December 29, 1934, Serial No. 759,806

1 Claim. (Cl. 80—51)

This invention relates to a novel guide device which is particularly adapted for guiding a heavy work-piece into or out of a metal-working mill, although not limited thereto.

It is particularly important in rolling mill practice to assure the proper entry and egress of a work-piece into and out of the metal-working pass, due to its inherent tendency to "whip" or otherwise become misalined, with consequent injurious results not only to itself but also to the mill operators. While numerous devices of the prior art are somewhat successful in effecting a proper guidance, they nevertheless are expensive to use, as frequent changes must be made to accommodate a work-piece of a different size, or cross-section. A great many types of rolling mills may be quickly adjusted to process a work-piece of changed cross-section, but the conventional guide devices are inflexible and require replacement, which is a very costly procedure; and particularly when it is only desired to make a short "run".

In my co-pending application, entitled "Guide devices", and filed concurrently herewith, I have disclosed a novel construction which functions throughout a relatively wide range of variations in work-piece cross-section, being adjustable in a very expeditious manner. The device of this co-pending application is, however, primarily intended for use on metal-working mills which require a relatively short effective guiding area of the successive elements.

It is among the objects of the present invention to provide a novel guide device for metal-working mills which is readily and rapidly adjustable to accommodate a relatively wide range of variations in work-piece cross-section, and one which is at the same time well adapted to effectively guide a heavy work-piece over an elongated area of contact. This feature is very important in the processing of heavy rounds which advance helically.

Another object is the provision of a novel device of the class described which may be easily and cheaply installed on existing types of metal-working mills.

These and further objects will be apparent after referring to the drawings, in which:

Figure 1 is a plan of the devices of the invention as used on a conventional type of seamless pipe or tube mill.

Figure 2 is an enlarged plan of the device of the invention.

Figure 3 is an enlarged sectional detail.

Figure 4 is an enlarged sectional view on the line IV—IV of Figure 3.

Referring more particularly to the drawings, the letters A designate a pair of suitably driven metal working rolls such as are commonly used in the manufacture of seamless pipes and tubes. In accordance with conventional practice, a piercing point B, or other mandrel, is carried on the end of a suitably supported bar C, and disposed intermediate the metal working rolls A.

As the work-piece W (a solid billet in the present instance) enters between the convergent portions of the metal-working rolls A, it is fixed over the piercing point B to form a tubular shell. During this operation, the work-piece W "whips" considerably on both sides of the mill, and particularly after it has assumed a tubular form.

The numeral 2 designates either an inlet and/or outlet trough for a metal-working mill which is adapted to process a work-piece of substantially cylindrical cross-section. A bed 3 is disposed on the floor of the mill immediately adjacent the trough 2 and carries a plurality of bearings 4 which are in alinement therewith in a vertical plane. An elongated shaft 5 is journaled in the bearings 4 and has secured thereto a plurality of alternately disposed cylinders 6.

Each of the cylinders 6 is provided with a plurality of peripheral recesses 7, 8, 9, 10, 12, 13, and 14, which are of different cross-section and arranged to extend axially therewith. The disposition of the shaft 5 with respect to the horizontal center line of the trough 2 is such as to permit a substantial alinement of the corresponding center lines of the recesses therewith. In the present instance the recesses 7, 8, 9, 10, 12, 13, and 14 are shown as being substantially U-shaped and of varying depth and width to accommodate a cylindrical work-piece, but it will be readily understood by those skilled in the art that the invention contemplates modifications according to any section capable of guidance as is, of course, the trough 2.

A housing 15 is mounted on the end of the bed 3 which is remote from the trough 2 and encloses a worm gear 16 which is secured to the adjacent end of the shaft 5. A suitable worm is also disposed in the housing 15 for enmeshment with the worm gear 16, being mounted on a shaft 18. This shaft 18 which is journaled in the housing 15, is driven by an adjacent motor 19 through a coupling 20.

A shaft 21 is extended along one side of the bed 3 and journaled in bearings 22. This shaft 21 carries a plurality of laterally extending kick-

off arms 23, and is partially rotated in any suitable manner to raise the work-piece, which is shown at W in Figure 1, and permit it to roll transversely from the device of the invention.

The motor 19 is actuated by the mill operator to aline the selected recesses 7, 8, 9, 10, 12, 13, and 14, the cylinders being provided with indicia, as at X, to assure the correct cross-section.

As previously pointed out, the device of the invention provides an elongated area of contact which is very effective in guiding heavy-work pieces. In order to assist the work-piece W in entering and leaving the various recesses, their ends are flared, as at 24.

Any type of "lid" or "cover" may be used in conjunction with the recesses in the cylinders 6, much in the same manner as they are employed in the prior art.

While I have shown and described one specific embodiment of my invention, it will be understood that I do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of my invention, as defined in the following claim.

I claim:

A guide device for metal-rolling mills comprising a plurality of rotatable elements having their axes of rotation in substantial parallelism with the line of pass of the mill, each of said rotatable elements having a plurality of recesses of varying cross-section in its periphery, said recesses having their axes in substantial parallelism with the axes of said elements, said plurality of rotatable elements being connected for rotation in unison.

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