May 14, 1957 J. REMMEN 2,792,097

POSITIONING DEVICE

Filed June 26, 1953 2 Sheets-Sheet 1

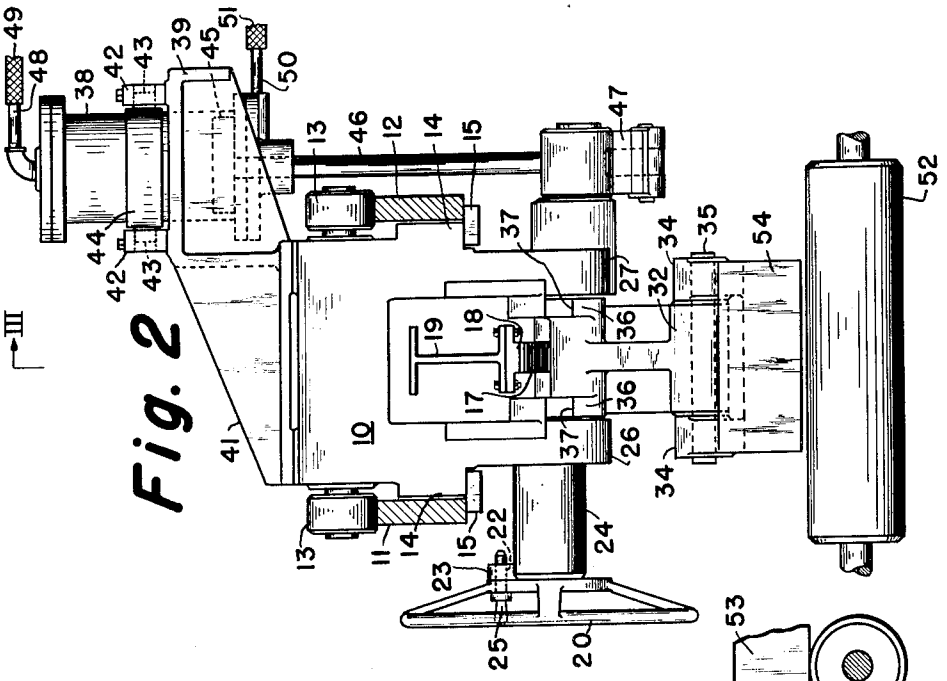


Fig. 2

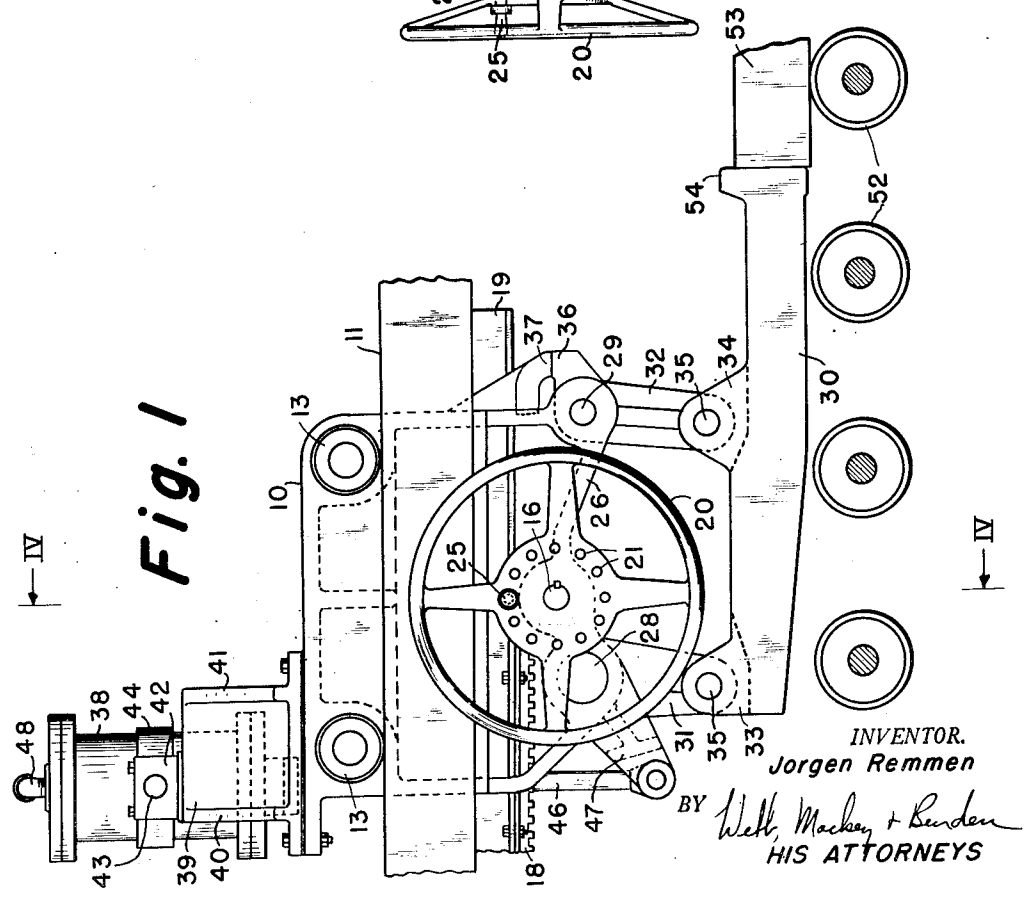


Fig. 1

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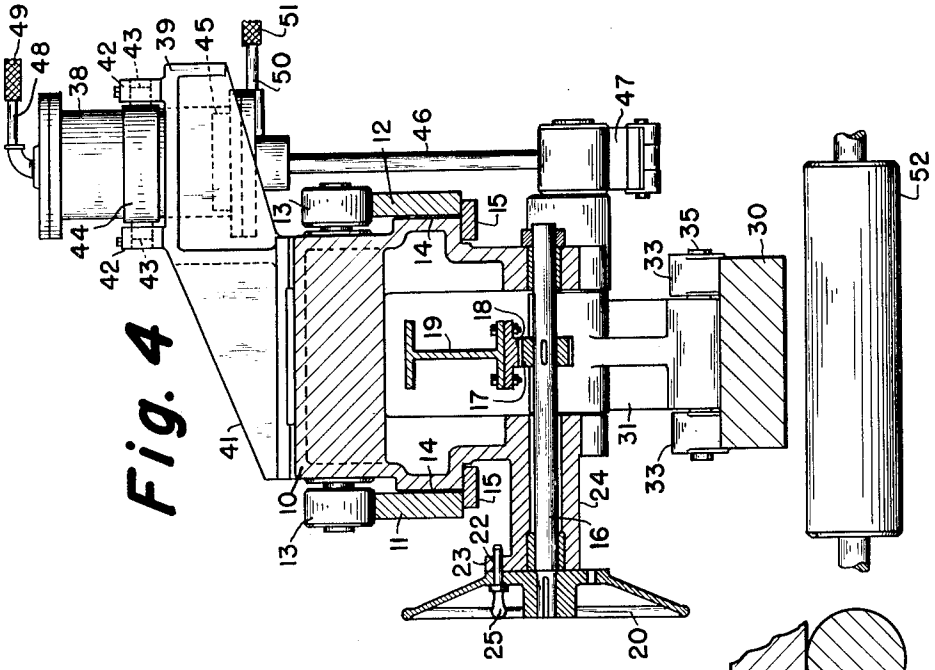


Fig. 4

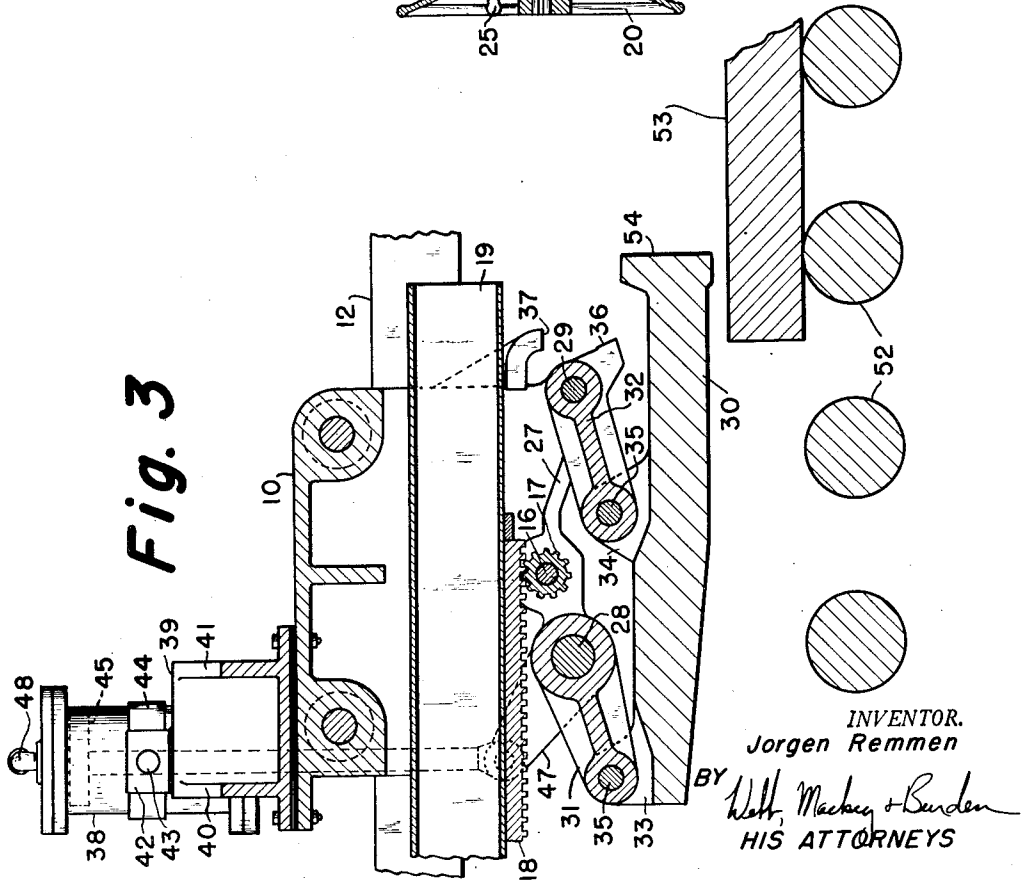


Fig. 3

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2,792,097

POSITIONING DEVICE

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10 Claims. (Cl. 193—35)

This invention relates to a positioning device and, more particularly, to apparatus designed to stop moving bars, pipes, rods, billets, skelp, slabs, and like articles, and then automatically place the articles in a predetermined position.

In processing articles of the type mentioned, it is very common to move them from one station to another where different steps are performed, for example, shearing to length. It is, of course, important that the articles be stopped at the correct position at each station. Heretofore, the articles have been stopped by their striking against an unyielding lug, crossbar, or similar device. Such a technique has several disadvantages. For example, heavy cumbersome stops are required to absorb the shock. Even more important, rods, bars, and like articles are customarily processed while still in a hot, semiplastic condition and are easily marked or dented or otherwise deformed as they strike against a hard, unyielding stop. Also, the article bounces from the stop and must be moved again to the position desired.

The present invention provides a positioning device which solves these problems. It embodies a movable member occupying a predetermined position against which the moving article strikes. The resulting movement of the member is dampened pneumatically so that the article is much more slowly brought to a stop. At the end of this "feathering" action, the member returns to its original position, and moves the article to the desired position. After the article has been processed, the moving member may be sufficiently withdrawn from contact with the article to permit it to travel to another station.

The accompanying drawings illustrate a presently preferred embodiment of the invention wherein:

Figure 1 is a side elevation of the shock absorbing gauge;

Figure 2 is a front elevation of the gauge of Figure 1;

Figure 3 is a section of Figure 2 on the line III—III but showing the shock absorbing bar in a receded position; and

Figure 4 is a section of Figure 1 on the line IV—IV.

Referring to the drawings, this embodiment comprises a frame 10 which rides over two parallel rails 11 and 12 on wheels 13 journaled in the frame. The frame 10 is designed for steady positioning with respect to the rails. For example, the frame is enlarged at 14 to a width substantially equal to the distance between the rails. This prevents excessive lateral movement of the frame and keeps the wheels over the rails. The frame also has laterally projecting strips 15 which engage the undersides of the rails. This limits vertical tilting of the frame especially when it absorbs a shock as hereinafter explained.

The frame may be moved along the rails by means of a shaft 16 journaled in the frame. The shaft has a pinion 17 mating with a rack 18 carried by a beam 19. The shaft has a handwheel 20, the hub of which has a plurality of openings 21. Each opening can be aligned with a similar opening 22 in an upstanding lug 23 on a sleeve 24 which is concentric with the shaft 16. By inserting a tight fitting plug 25 into aligned openings in the hub and lug, the frame may be locked in a selected position on the rails.

Two side legs 26 and 27 of the frame extend below the rails and contain two parallel axles 28 and 29 journaled transversely to the rails. Arms 31 and 32 keyed

to the axles 28 and 29 carry a bar 30 at their lower ends. The arms are pivotally connected to the bar 30 by pins 35 and lugs 33 and 34 on the bar. The arm 32 also carries an integral knob 36 which butts against a ledge 37 on the frame. This construction limits the forward movement of the bar and determines a position for the bar which is constant with respect to the frame.

The frame also carries a compressed air cylinder 38 on an offset platform 39 having supporting uprights 40 and 41. The platform has bearing posts 42 wherein pivot oppositely extending studs 43 of a band 44 encircling the cylinder. The latter has a piston 45 and a piston rod 46. Connecting arm 47 pivotally joins the rod and is keyed to the axle 28. If desired, the cylinder 38 may be a closed system containing compressed air, but usually a supply line 48 having a flexible length 49 is used to maintain the pressure. Preferably, the cylinder is double-acting as hereinafter explained, and to this end another supply line 50 having a flexible length 51 joins the cylinder on the other side of the piston.

In operation, the bar 30 of the apparatus described is placed in front of moving bars, rods, and like articles, and the frame 10 is locked at a desired point on the rails in accordance with the gauging action desired. Thereafter, the articles are directed against the receiving head of the shock absorbing bar. Various conveying means may be used to carry the moving articles, but usually a conventional roller table having rolls 52 is employed. When an article 53 rams against the receiving head 54, the bar 30 swings turning the axles 28 and 29 and thrusting the rod 46 upwardly. The compressed air in the cylinder 38 opposes this action and gradually stops the article. During this time, the strips 15 prevent the frame 10 from tilting about the rails. After the momentum of the moving article has been absorbed, the compressed air in the cylinder 38, now further compressed because of the described action of the bar, plus the moment of the weight of the bar about the axles 28 and 29 return the bar to its original predetermined position, thereby pushing the article 53 backward also. However, this return movement is sufficiently slow so that when the bar is stopped by the knob 36 and ledge 37, the article does not continue to travel but also stops. The action of the piston 45 in hitting the bottom of the cylinder 38 can also be used as a stop, in which case the knob 36 and ledge 37 are not required. Accordingly, each article so stopped is automatically placed in a predetermined position and any subsequent operation requiring a gauged position, such as shearing or the marking of a definite length, may be immediately performed.

In the event it is necessary to advance the article to still another station following such an operation as just mentioned, compressed air is admitted through the supply line 50 to lift the piston 45 which in turn raises the bar 30 out of the path of the article.

It will now be apparent that in a gauge of the present invention, the shock absorbing member does not quickly wear away or break off and that the article stopped is not dented or marked even though it may be semiplastic. Moreover, each article processed is automatically placed in a gauging position and can later be advanced to another station without changing the direction of travel from which it came.

While the foregoing disclosure describes a presently preferred embodiment, it is understood that the invention may be practiced in other forms within the scope of the following claims.

I claim:

1. A positioning device for stopping moving bars, pipes, rods, and like articles at a predetermined point in their paths of travel comprising a frame adapted to travel along said paths, means to lock the frame at a desired

point in the paths, a shock absorbing bar disposed beneath the frame, an arm pivotally joining the rear of the bar and the frame, a second arm pivotally joining a medial portion of the bar and the frame at a point spaced from the first pivotal connection, means to limit forward movement of the bar, and a compressed air cylinder supported by the frame having a piston rod operatively connected with the rear of the bar whereby the air opposes rearward movement of the bar and compression of the air by said rearward movement urges the bar in the opposite direction and against the means for limiting forward movement.

2. A positioning device for stopping moving bars, pipes, rods, billets, skelp, and like articles at a predetermined point in their paths of travel comprising a track, a frame adapted to travel the track, means to lock the frame at a desired point on the track, two axles journaled in the frame at spaced-apart points, a shock absorbing bar disposed longitudinally beneath the frame and pointed in a direction from which a shock is to be received, a connecting arm pivotally joined to the rear of the bar and fixed to the rear axle, a second connecting arm pivotally joined to a medial portion of the bar and fixed to the remaining axle, a stop to limit forward movement of the bar beyond a predetermined position, a compressed air cylinder supported by the frame having a piston and piston rod, and a third connecting arm pivotally joined to the piston rod and also fixed to the rear axle whereby the air in the cylinder opposes rearward movement of the bar and urges the bar against the stop to the predetermined position.

3. A positioning device for stopping moving bars, pipes, rods, billets, skelp, and like articles and place them in a predetermined position required by a succeeding operation including spaced-apart rails, a frame inserted between the rails and adapted to ride thereon, means to lock the frame at a desired point on the rails, two substantially parallel axles journaled in the frame transversely to the rails and at spaced-apart points below the rails, a shock absorbing bar disposed longitudinally beneath the frame and pointed in a direction from which a shock is to be received, a connecting arm pivotally joined to the rear of the bar and fixed to the rear axle, a second connecting arm pivotally joined to a medial portion of the bar and fixed to the remaining axle, a stop on the frame to limit forward movement of the bar beyond the predetermined position, a double-acting compressed air cylinder pivotally supported on the frame having a piston and piston rod, and a third connecting arm pivotally joined to the piston rod and also fixed to the rear axle whereby the air in the double-acting cylinder normally opposes rearward movement of the bar and urges the bar against the stop to the predetermined position but is also adapted to raising the bar by the described linkage to allow said articles to pass beneath the gauge.

4. A positioning device as claimed in claim 3 wherein the frame inserted between the rails is adapted to ride thereon by wheels journaled in the frame and said frame has a width at least at one point between the rails substantially equal to the distance between the rails to prevent excessive lateral movement of the frame.

5. A positioning device as claimed in claim 4 wherein the frame also has a laterally projecting strip engageable with the underside of a rail to prevent excessive vertical tilting of the frame and wherein the means to lock the frame at a desired point on the rails includes a shaft journaled in the frame and having a pinion, a fixed rack engageable with the pinion, and means to prevent relative movement of the shaft and frame.

6. A positioning device for stopping moving bars, pipes, rods, and like articles at a predetermined point in their paths of travel comprising a frame adapted to travel along said paths, means to lock the frame at a desired point in the paths, a shock absorbing bar disposed beneath the frame, and arm pivotally joining the rear of

the bar and the frame, a second arm pivotally joining a medial portion of the bar and the frame at a point spaced from the first pivotal connection, means to limit forward movement of the bar including a stop on the frame engageable with the bar, and a compressed air cylinder supported by the frame having a piston rod operatively connected with the rear of the bar whereby the air opposes rearward movement of the bar and compression of the air by said rearward movement urges the bar in the opposite direction and against the means for limiting forward movement.

7. A positioning device for stopping moving bars, pipes, rods, and like articles at a predetermined point in their paths of travel comprising a frame adapted to travel along said paths, means to lock the frame at a desired point in the paths, a shock absorbing bar disposed beneath the frame, an arm pivotally joining the rear of the bar and the frame, a second arm pivotally joining a medial portion of the bar and the frame at a point spaced from the first pivotal connection, a compressed air cylinder supported by the frame having a piston and piston rod, the piston normally, substantially contacting one end of the cylinder and the piston rod being operatively connected to the rear of the bar whereby the air opposes rearward movement of the bar and compression of the air by said rearward movement urges the bar in a forward direction to a position determined by the contact of said piston against said cylinder end.

8. A positioning device for stopping a moving article at a predetermined point in its path of travel comprising a frame adapted to travel along said path, means to lock the frame at a desired point along the path, a shock absorbing bar movably supported by the frame in the path of travel of the article to be stopped to engage the moving article, a cylinder and piston operatively connected to said bar and containing gas under pressure whereby movement of the bar upon impact between the bar and the moving article further compresses the gas in the cylinder, the compressed gas opposing motion of the bar and of the article and returning them to said predetermined point and means for limiting the return movement of the bar and of the article to said predetermined point.

9. A positioning device for stopping a moving article at a predetermined point in its path of travel, comprising a shock absorbing bar, a movable support for said bar and adapted to support the bar in the path of travel of the article to be stopped to engage the moving article, a cylinder and piston operatively connected to said bar and containing a gas whereby movement of the bar upon impact between the bar and the moving article compresses the gas in the cylinder, compression of the gas opposing motion of the bar and of the article and returning them to a position at rest at said predetermined point.

10. A positioning device for stopping a moving article at a predetermined point in its path of travel, comprising a shock absorbing bar, a support for said bar adapted to support the bar in the path of travel of the article to be stopped to engage the moving article, said support also being adapted to support the bar away from said path of travel, a double acting cylinder and piston operatively connected to said bar and containing a gas between one side of the piston and the cylinder whereby movement of the bar upon impact between the bar and the moving article compresses the gas in the cylinder, compression of the gas opposing motion of the bar and of the article and means for admitting fluid under pressure into the cylinder on the other side of said piston to move the bar away from said path of travel.

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