Feb. 15, 1966 A. S. DINSMORE 3,234,829

STEADY REST

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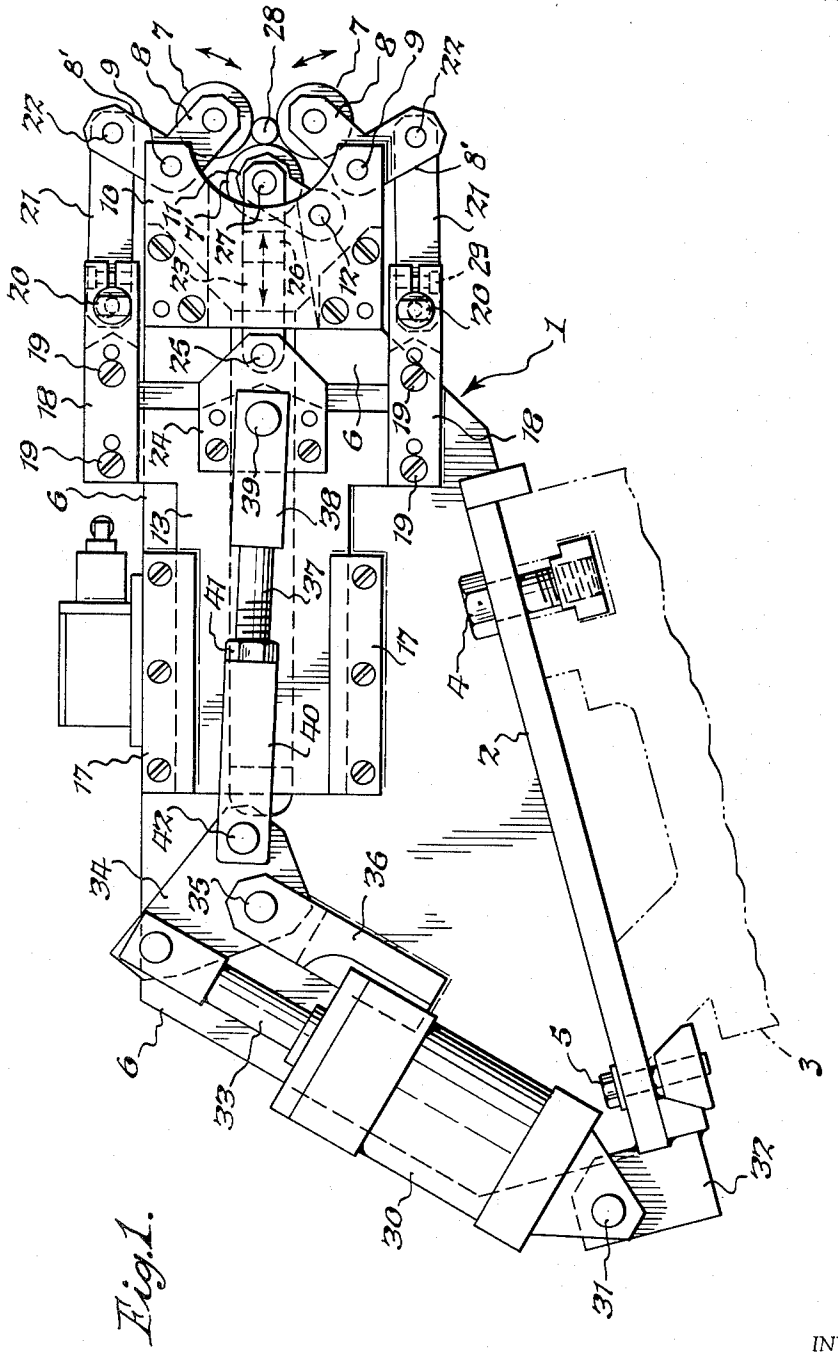


Fig. 1.

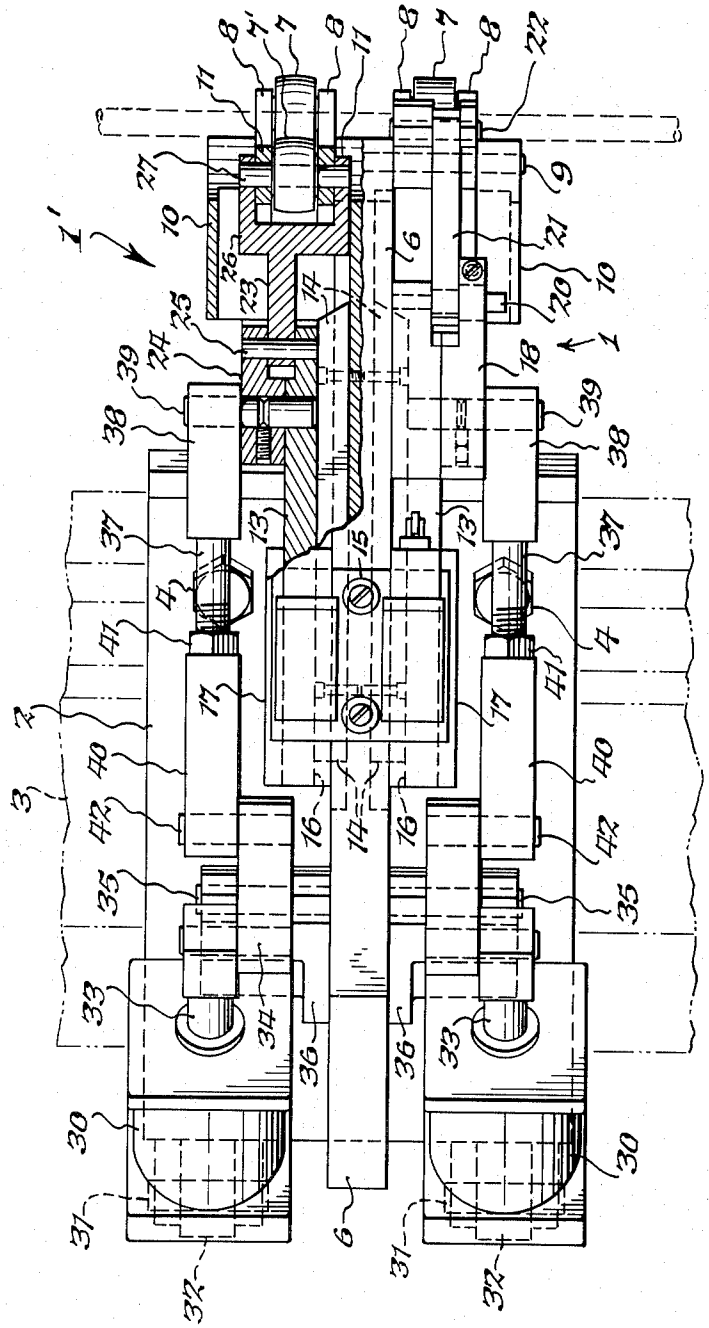
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Fig. 2.



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STEADY REST

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This invention relates to a new and useful steady rest particularly adapted for use in conjunction with lathes and similar machine tools.

A primary object of my invention is to provide a steady rest which will perform its intended function without distorting the workpiece, regardless of its diameter.

Another object of my invention is to provide a sequentially operable duplex steady rest.

In one aspect thereof, a steady rest constructed in accordance with my invention is characterized by the provision of three work-engaging members spaced about a work axis, an operating member, a set of three arms having relatively fixed rock axes, the work-engaging members being carried by the arms, and connection means between the operating member and the arms whereby movement of the former produces equal movement of the work-engaging members relative to the work axis.

The foregoing and other objects, advantages and characterizing features will become clearly apparent from the ensuing detailed description of one, illustrative embodiment thereof, considered in conjunction with the accompanying drawing wherein like reference numerals denote like parts throughout and wherein:

FIG. 1 is an end elevational view of a duplex steady rest of my invention; and

FIG. 2 is a front elevational view thereof, certain parts being broken away to show details.

Referring now in detail to the illustrative embodiment depicted in the accompanying drawings, there is shown a duplex steady rest of my invention comprising a pair of steady rests **1**, **1'**, identical except for the configuration of the work-engaging rollers. While shown in horizontal position, the steady rests normally are generally vertical. The steady rests **1**, **1'** have a common mounting, comprising a pad **2** secured to the base **3** of the machine tool, as by appropriate bolt fastenings **4** and **5**, and a plate **6** secured to pad **2**. Plate **6** is normal to pad **2**, whereby they comprise a T-shaped mounting.

The duplex unit offers certain advantages, as will become apparent. However, each steady rest can be used singly, and since they are identical in construction and operation, only one will be described in detail.

Each steady rest **1**, **1'** is provided with three work-engaging members in the form of rollers. Two of the rollers, shown at **7**, are mounted on crank type rock arms **8** pivotally supported at **9** between mounting plate **6** and a plate **10**. The third roller, shown at **7'**, is mounted on a rock arm **11** pivoted at **12** between plates **6** and **10**. The axes of pivots **9** and **12** are parallel to the work axis **28**, and arms **8** and **11** extend generally circumferentially of the work axis.

An operating member in the form of a slide block **13** moves linearly along plate **6**, being guided by a vertically elongated key **14** which is secured in a slot plate **6**. Key **14** engages in a key way **16** in the back of slide block **13**, and the slide block is held against plate **6**, in sliding engagement therewith, by a pair of flanged blocks **17** overhanging slide block **13** and carried by plate **6**.

A pair of brackets **18** are carried by slide **13**, being secured thereto as by fastenings **19**. At their upper ends, brackets **18** are bifurcated to releasably clamp about an eccentric pivot **20** on which the lower ends of connecting links **21** are journalled. Pivots **20** are clamped in adjusted position about their axes by bolts **29**. At their

upper ends, links **21** are pivoted, at **22**, to the outer ends of operating arms **8'** on bell cranks **8**. Another connecting link **23** is pivoted at its lower end between slide block **13** and a plate **24** carried thereby, as shown at **25**. At its upper end, link **23** is provided with a clevis **26** journalling the axle **27** of wheel **7'**.

Thus, arms **8** and **11** are pivoted about their axes **9** and **12** upon linear movement of slide block **13**. This movement is provided by a suitable motor, such as the air cylinder **30** pivotally mounted at **31** on a bracket **32** and containing a piston, not shown. Piston rod **33** is pivoted at its outer end to a bell crank **34** having a fixed pivot **35** on a bracket **36**. A connecting rod **37** is secured at one end in a head **38** pivoted at **39** to plate **24** and block **13**. At its other end, rod **37** is threaded in a socket **40**, being locked in adjusted position by nut **41**, whereby the length of rod **37** can be selectively varied. The lower end of socket **40** is pivoted on bell crank **34**, as shown at **42**.

Rock arms **8** and **11** position the work-engaging rollers **7**, **7'** equal distances from pivots **9** and **12**. Also, rock arm **11** and operating arm **8'** extend at identical angles, although one operating arm **8'** extends upwardly and outwardly in the opposite direction from the other operating arm **8'** and rock arm **11**. Eccentric pivots **22** provide a means for adjusting the angle of operating arms **8'** into correspondence with the angle of rock arm **11**, and thereby compensate for manufacturing tolerances. Links **21** and **23** are connected to arms **8'** and **11** at equal distances from pivots **9** and **12**.

Thus, work-engaging rollers **7**, **7'** are swung through identical arcs toward and away from work axis **28**, upon movement of slide block **13** in opposite directions. As a result, rollers **7**, **7'** are always centered relative to work axis **28**, regardless of their position along the arcs comprising their range of movement. The position of such arcs can be adjusted, to accommodate different ranges of workpiece diameters by adjusting the length of connecting rod **37** and thereby varying the arcuate position of rollers **7**, **7'** for a given position of motor **30**.

The provision of a duplex steady rest enables sequential operation, while providing a compact unit. For example, when used with a lathe type of machine tool having a movable carriage, the first steady rest **1** will be open, to pass the cutting tool, while the second steady rest **1'** will engage and support the workpiece. Then, once the cutting tool is past steady rest **1**, it will engage and support the workpiece while steady rest **1'** is open to pass the tool.

Accordingly, it is seen that my invention fully accomplishes its intended objects. While I have disclosed and described in detail only one embodiment of my invention, that has been done by way of illustration only, it being intended that the scope of my invention be defined by the appended claims.

Having fully disclosed and completely described my invention, and its mode of operation, what I claim as new is:

1. In a steady rest for lathes and similar machine tools, a set of three work-engaging members spaced about a work axis, three rock arms having relatively fixed pivots, said work-engaging members being carried by said rock arms at substantially equal distances from said pivots to move toward and away from said work axis along substantially identical arcs, operating means, first link means between said operating means and one of said arms, the other two rock arms having operating arms movable therewith, and second link means independently linking said operating means and said two operating arms, said one rock arm and said operating arms extending from said pivots at substantially the same angle and said first

and second link means being connected to the associated arms at substantially equal distances from said pivots, whereby movement of said operating means produces substantially identical movements of said three work-engaging members toward or away from said work axis.

2. A steady rest as set forth in claim 1, together with adjustable eccentric pivot means connecting each of said second link means to said operating means.

3. A steady rest for lathes and similar machine tools as set forth in claim 1 together with mounting means for vertical attachment of the rest to the machine tool whereby when the rest is mounted and the three work engaging members are positioned away from said work axis, a work piece may be dropped into place between said work engaging members.

4. In a steady rest for lathes and similar machine tools, a set of three work engaging rollers spaced about a work axis, three rock arms of equal length having relatively fixed pivots and extending in a generally circumferential direction with respect to said work axis, one of said rollers being rotatably carried by the outer end of each rock arm to move toward and away from said work axis along substantially identical arcs, operating means movable in a generally radial direction with respect to said work axis and connected by first link means to one of said rock arms, the other two rock arms having operating arms movable therewith, and a pair of second link means independently linking said operating means and said two operating arms whereby radial movement of said operating means produces substantially identical movements of said three rollers toward or away from said work axis.

5. In a steady rest for lathes and similar machine tools, a set of three work-engaging rollers spaced about a work axis, three rock arms of equal length having relatively fixed pivots and extending in a generally circumferential direction with respect to said work axis, one of said rollers being rotatably carried by the outer end of each rock arm for movement toward and away from said work axis along substantially identical arcs, operating means movable in a generally radial direction with respect to said work axis, first link means between said operating means and one of said rock arms, the other two rock arms having operating arms movable therewith, and second link means between said operating means and said two operating arms, said one rock arm and said operating arms extending at substantially the same angle and said link means being connected to the associated arms at substantially equal distances from said pivot, whereby radial movement of said operating means produces substantially identical movements of said three rollers toward or away from said work axis.

6. A steady rest for lathes and similar machine tools as set forth in claim 4 together with mounting means for vertical attachment of the rest to the machine tool whereby when the rest is mounted and the three work engaging members are positioned away from said work axis, a work piece may be dropped into place between said work engaging members.

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