2 Sheets--Sheet 1.

J. ROBERTSON.

Machines for Straightening Metallic Bars and Rods.

No. 149,065. Patented March 31, 1874.

Fig. 2

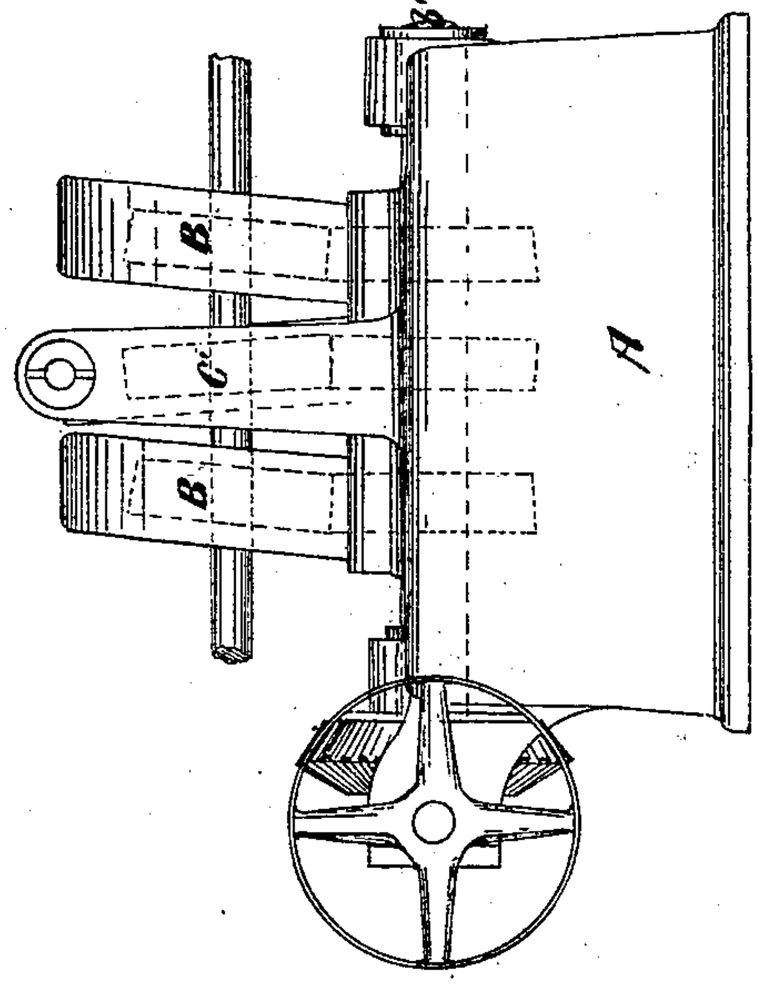

Fig. 1

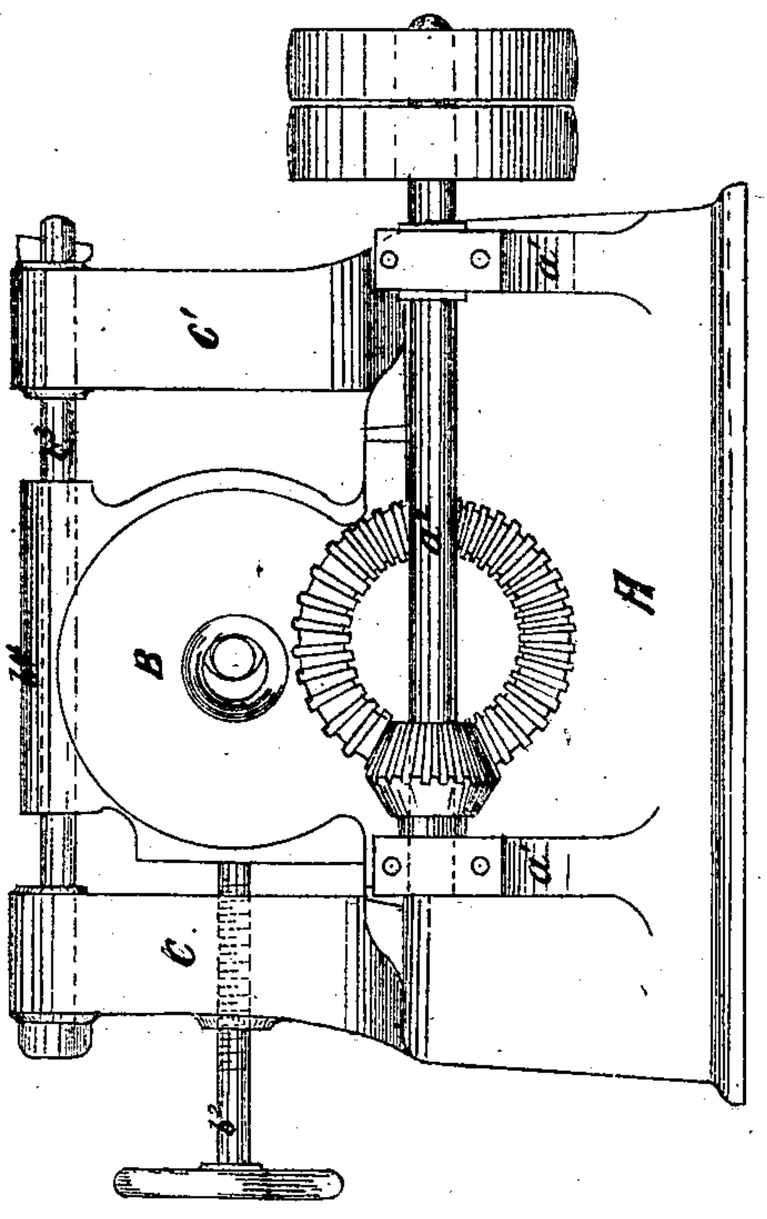

Fig. 3

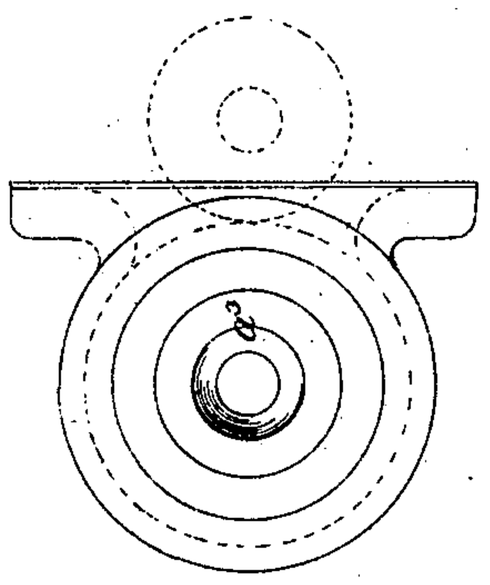

Fig. 4.

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George Landon

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Fig. 5

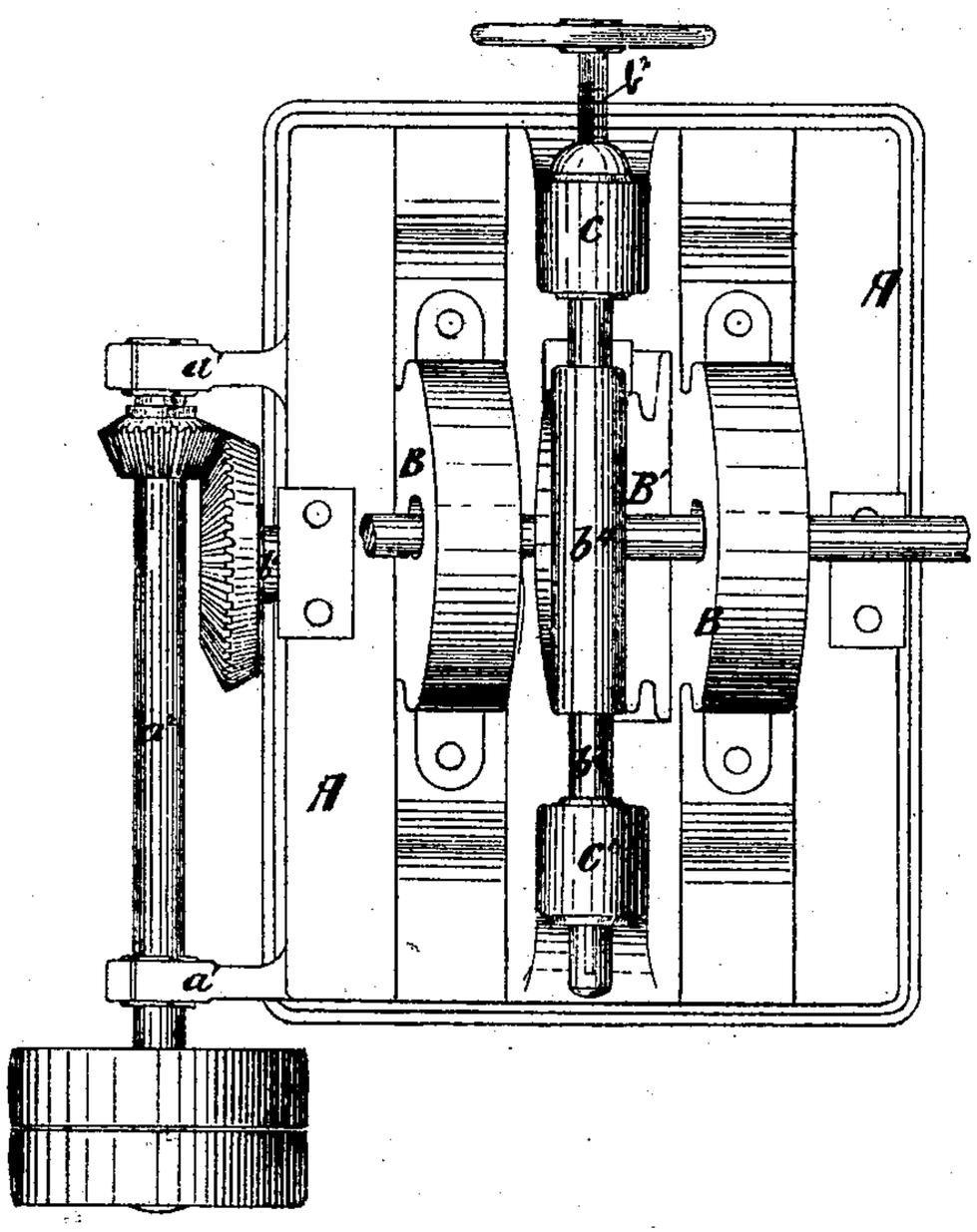


Fig. 6

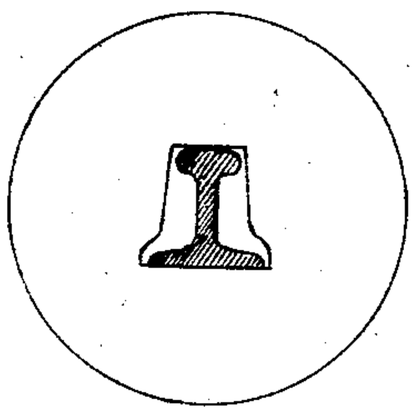
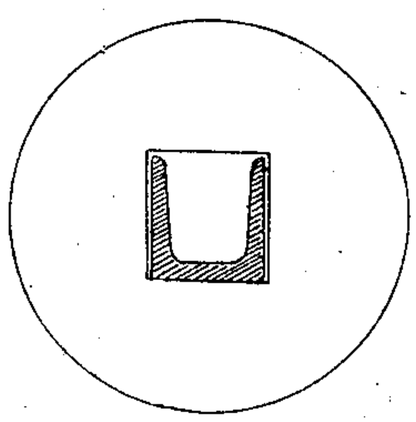


Fig 7.



WITNESSES
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UNITED STATES PATENT OFFICE.

JAMES ROBERTSON, OF GLASGOW, SCOTLAND.

IMPROVEMENT IN MACHINES FOR STRAIGHTENING METALLIC BARS AND RODS.

Specification forming part of Letters Patent No. **149,065**, dated March 31, 1874; application filed July 28, 1871.

To all whom it may concern:

Be it known that I, JAMES ROBERTSON, of Glasgow, in the county of Lanark, North Britain, have invented certain new and useful Improvements in Machinery for Operation Upon and Shaping Metal; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to revolving disks operated by suitable machinery for the purpose of straightening and finishing iron bars and the like, and the making, straightening, and finishing of metal tubes.

In the accompanying drawings, Figure 1 is an end elevation of a set of my frictional screwing-rings, showing machinery for turning the same. Fig. 2 is a side elevation of same. Fig. 3 is an end elevation of one disk with housing; Fig. 4, a cross-section of same. Fig. 5 is a plan of my improved disks or rings. Figs. 6 and 7 are two face views of central die-rings to suit the form of bar (shown in section) within them.

A bed-plate, A, is so constructed as to carry the whole of the devices used. At the one end thereof are two projecting bearings, a^1, in which the counter-shaft a^2 revolves. Along the top of bed-plate A, and at proper distances apart, are fixed three housings, B B B′, to carry toothed disks or rings *e*. The teeth on these disks or rings *e* project, if necessary, from their peripheries, having flanges at the ends of the teeth, and form one-half, or thereabout, of the widths of said disks. Said disks or rings are so constructed as to receive, internally, die-rings a^3, of any suitable construction as regards their internal formation. The said housings B B B′ form a bush, suited to the shape of the periphery of, and in which the said disks *e* revolve, having on the side thereof an adjustable plate, a^4, for the removal of said disks when so required. These housings or bushes have openings on the under side to expose the teeth on the peripheries of said disks, all at like points and in one line. Under the said disks, and running the whole length of the frame, is a shaft, b^1, with any suitable bearings, and having keyed thereon three toothed pinions to gear with the teeth on the peripheries of said disks, and serving to drive them simultaneously, and all in one direction. The middle disk B′ can be adjusted to any required position to suit the size of metal to be straightened by means of the screw-spindle b^2, running through standards C and C′, and operating upon the housing B′, which is made adjustable on the bed-plate or frame A of the machine. Through the upper ends of the two standards C and C′ is placed a guide-bar, b^3, on which the sleeve b^4, attached to housing B′, slides. The two outer disks of the set of three disks are set at a slight angle, about one inch to the foot being a suitable angle, in one direction from the line or course the bar or tube is to be traversed through, and the central one is placed at the reversed angle. The interiors of these disks, or the die-rings placed therein, are made somewhat larger in diameter than the round bars or tubes to be straightened, and the middle ring is set to the one side out of line with the other two disks as much as the difference of diameter of the bar or tube to be acted upon, and the internal diameter of the ring. For straightening round bars, the internal surfaces of the disks or rings, or of the die-rings inserted therein, are formed round and concentric with their peripheries. But for straightening square, angle, T bars, railroad-rails, and the like, the internal shape of the die-rings is formed similarly to the form of the bar, or at least so as to bear upon their extreme sides or points in their cross-section, and somewhat larger in diameter than the bars to be straightened, as shown in Figs. 6 and 7 of the accompanying drawings. The central disk B′ being made adjustable in its position, as described, by moving it to one side its internal surface is made to press against a part of the bar, which makes the other two rings also bear hard in contact with the opposite surface or periphery of the bar, the bar or tube being in this manner grasped hard by all three rings. Motion is given to these disks from the pinions on shaft b^1 under said disks, which is rotated from the counter-shaft a^2, this counter-shaft a^2 being driven by a strap on a pulley attached to the end of same, or by any other suitable means. On the three rings being set in motion, their internal

surfaces, or the internal surfaces of the die-rings inserted therein, grasp and impinge tangentially and obliquely, and communicate a rotatory and screwing motion to the bar being straightened. While the bar is being screwed through between the rings, should any part of it be high or crooked, the opposite surfaces of the three rings combine to force it straight, and at the same time to clean the bar or tube by attrition. Various arrangements of axis-bushes for adjustment to various sizes of bars, and for gearing these rings to give motion to them in a suitable manner, can be made. This arrangement of disks may also be employed for bending and overlapping sheets or plate-iron to prepare them for the welding-furnace and rolls. To facilitate this operation, it will be an advantage to have the plates partially bent round before they are entered into the rings. Any degree of lap can be given them by adjusting up the middle disk or ring. The screwing action of the internal surfaces of the rings on bars which are not round is different from the action on round bars, in respect that the bar performs one revolution only for each revolution of the ring; but it is otherwise screwed or carried forward in the same manner as round bars on being grasped at both sides at the same instant. In this way the same straightening and cleansing effect, by adjustment of the rings by screws or other suitable means, is obviously obtained for nearly all sections of bars as is obtained on round bars, as hereinbefore described. Frictional screwing motion by rings may also be employed for turning round bars under the operation of hammers. They may also be used for driving and screwing forward bars under the operation of turning and grinding tools, and for other similar purposes. Various other combinations and arrangements of my improved disks or rings can obviously be made on the same principles.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a machine constructed substantially as hereinbefore described, obliquely-disposed disks B B′ B, provided with detachable dies, as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in the presence of two witnesses this 1st day of February, 1872.

JAMES ROBERTSON.

Witnesses:

J. G. SMITH,

JOHN T. KING.