(No Model.)

W. STEEL.

MACHINE FOR ROUNDING, STRAIGHTENING, AND PLANISHING METAL BARS.

No. 491,668. Patented Feb. 14, 1893.

Fig. 1.

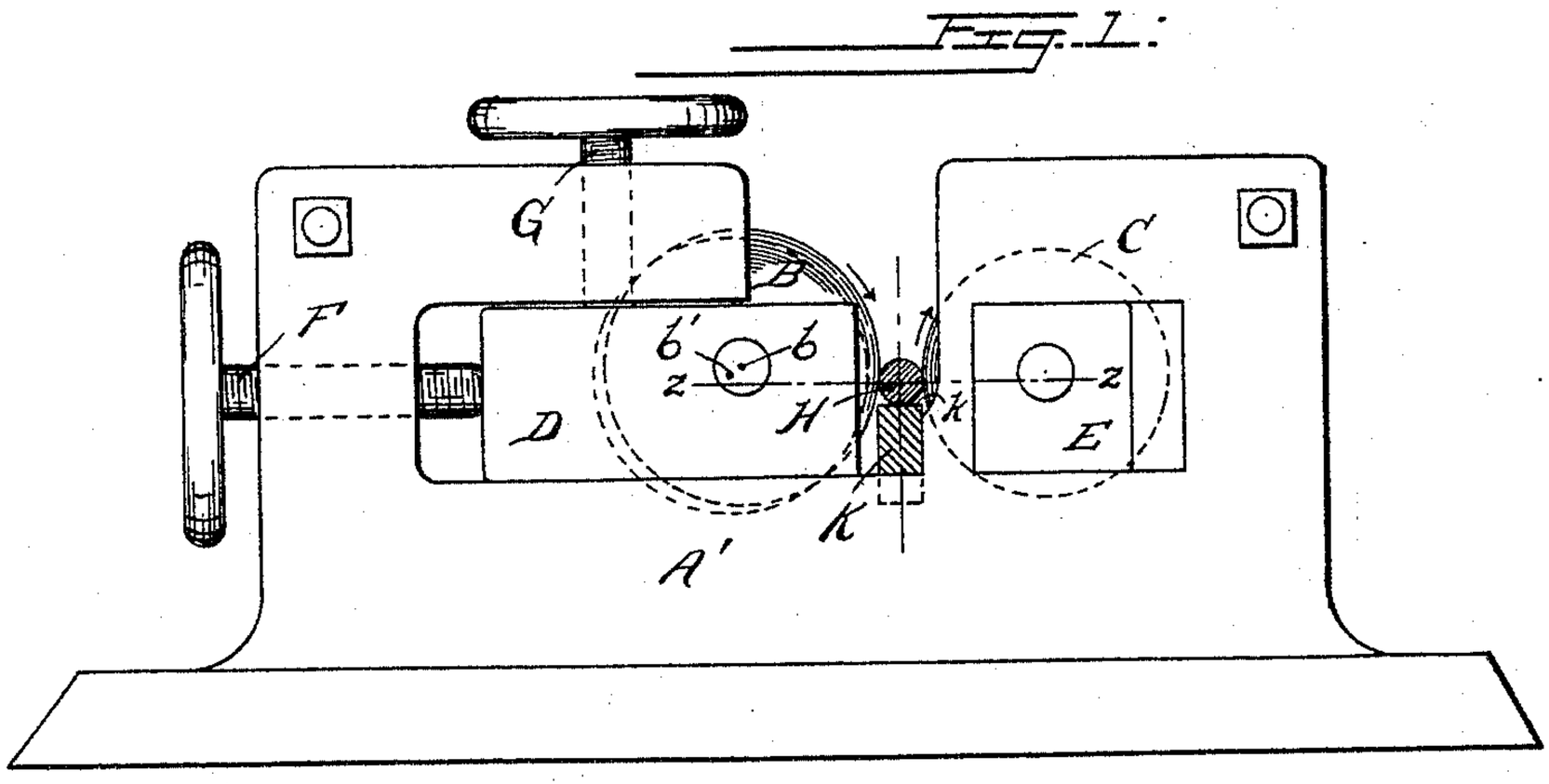
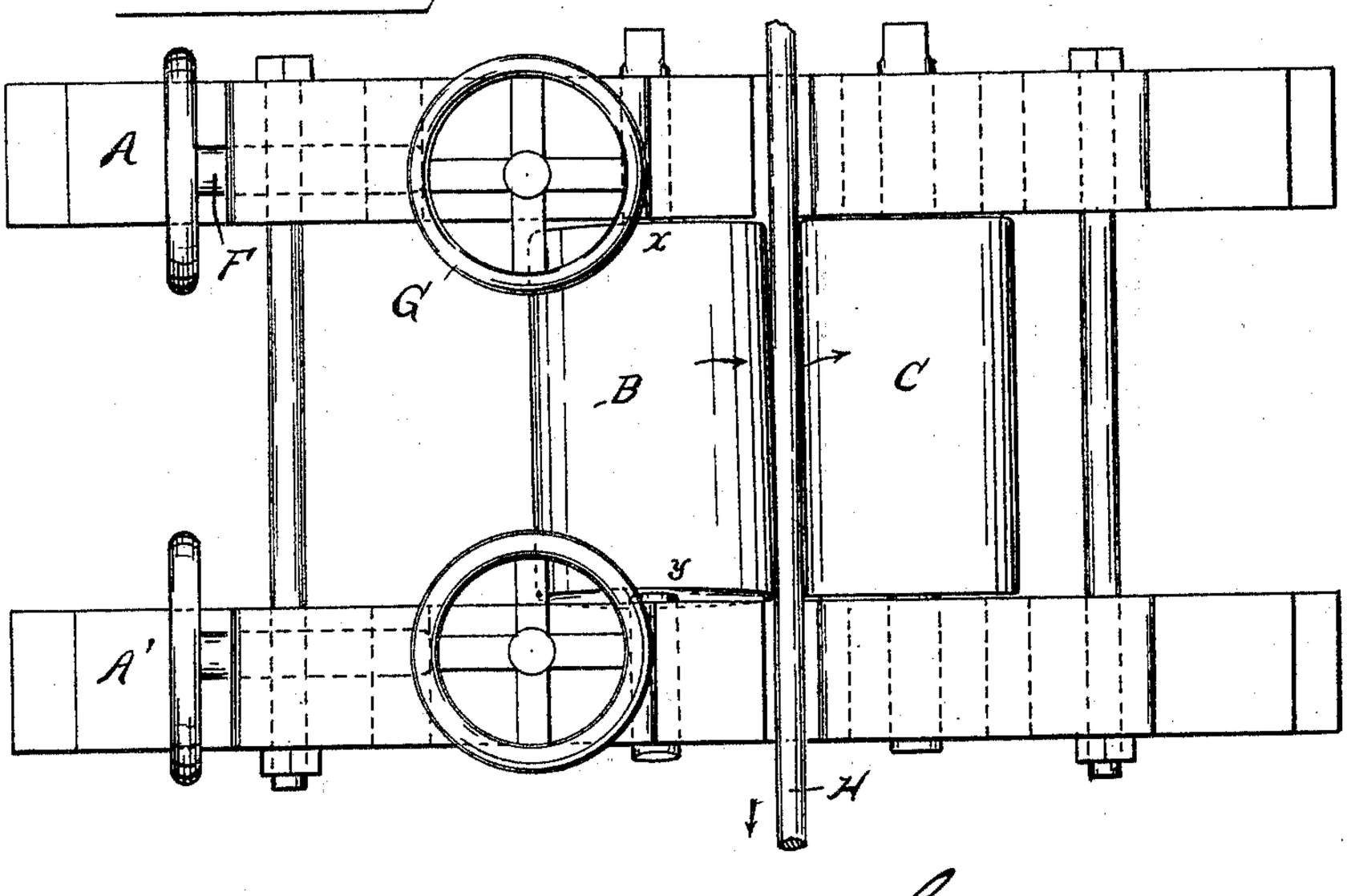


Fig. 2.



Witnesses
E. A. Kelly Jr.
David Levan

Walter Steel Inventor

By his Attorney W. F. Edwards

UNITED STATES PATENT OFFICE.

WALTER STEEL, OF READING, PENNSYLVANIA.

MACHINE FOR ROUNDING, STRAIGHTENING, AND PLANISHING METAL BARS.

SPECIFICATION forming part of Letters Patent No. 491,668, dated February 14, 1893.

Application filed June 13, 1892. Serial No. 436,504. (No model.)

To all whom it may concern:

Be it known that I, WALTER STEEL, a citizen of the United States, residing at Reading, in the county of Berks, State of Pennsylvania, have invented certain Improvements in Machines for Rounding, Straightening, and Planishing Metal Bars, of which the following is a specification.

My invention relates particularly to the manufacture of round bars of metal and has for its complete object the perfecting of the rough-rolled metal by a single continuous and automatic operation in which the perfect rounding and straightening of the bar and the planishing of its surface will be simultaneously effected. Heretofore a variety of mechanisms have been devised for accomplishing these effects, but in no case so far as I am aware, have they been effected in the manner which I am about to describe in connection with the accompanying drawings.

The novel features of the invention are specifically set out in the claims.

Figure 1 is an end elevation and Fig. 2 a plan view of a simple form of machine embodying the essential features of my invention.

A and A′ represent housings in which are mounted two rolls B and C. The roll C as shown is somewhat smaller in diameter than the roll B and turns in fixed bearings E, its axis being in horizontal position and at right angles to the bearings. The roll B as already stated has a somewhat greater diameter than C and is mounted in bearings D which are adjustable laterally by means of a screw F and to a more limited extent vertically by means of a clamping screw G and suitable liners. These bearings D in the housings A and A′, being separately adjustable, permit the axis of the roll B to be readily set to varying angles both in vertical and horizontal planes with the roll C, as well as at different distances from it the vertical adjustment being provided for in the construction illustrated by placing liners of different thickness under the bearing D.

I will proceed to describe the relative position of the rolls essential to the complete operation of my machine after first referring more particularly to the character of the operation which it is intended to perform.

H represents a round rod of metal which after having been rolled to shape in the ordinary manner is being subjected in my machine to a simultaneous rounding, straightening, and planishing action while being automatically fed onward. The line of outward movement of the bar is exactly parallel with the roll C and is maintained in constant contact with its surface through substantially the whole length of the roll by the joint action of the two rotating rolls, and the planishing tool K, which latter is located between the rolls and below the rod H. Both the rolls B and C are positively rotated in the same direction as indicated by the arrows by any suitable mechanism not shown and when they are of the relative sizes indicated in the drawings where B is of larger diameter than C may make the same number of revolutions, the greater diameter of the roller B causing it to have a greater surface speed than C.

The planishing tool K is preferably so arranged that its upper surface *k* which is perfectly smooth and hard, will be in contact with the surface of the round rod H when the center of the latter is slightly below the center of the roll C. The roll B is set out of parallel with the roll C, its axis being inclined so as to keep the entering end, which is marked X in Fig. 2, a sufficient distance from the roll C to permit the rod H to be readily entered between the rolls, while the forward end Y presses hard against the rod; at the same time the forward end Y is raised higher than the entering end X so that its center is above the center line Z Z which passes through the center of the rod. The relative positions of the center of the roll B at opposite ends X Y is indicated in exaggerated degree in Fig. 1 at *b′* and *b* respectively.

The effect of the arrangement of parts just described is that when the machine is in operation and a bar H is entered between the rolls at X, it is subjected to rotary pressure between their surfaces and is at once rotated with them. The surface speed of the roll B being in excess of C owing to the fact already stated that it is of greater diameter while arranged to make the same number of revolutions tends constantly to press the rod down upon the smooth surface *k* of the planishing tool K, with the whole length of which as well as of the roll C it is held close in contact while

it is being rapidly rotated. At the same time also an endwise strain tending to automatically feed the roll forward is produced owing to the inclination of the roll B which causes that portion of its surface which is in contact with the rod H to move slightly forward in rotating around its own axis.

It will thus be noticed that the following effects are simultaneously and automatically produced upon the rod operated on:—first it is pressed firmly between the surfaces of the rotating rolls and the tool K; secondly it is rapidly rotated with the rolls; thirdly its rotating surface is pressed against the fixed tool K and subjected to a continuous planishing action; and fourthly it is continuously fed onward. The joint effect of these simultaneous actions is that the bar is perfectly rounded to a uniform diameter, all kinds of bends are straightened out, and the surface is hardened and planished; the whole length of the bar being automatically acted upon.

While my machine is more especially adapted for operating upon continuous lengths of round bars it is obvious that it may be arranged to operate upon short lengths which need not be fed onward, by dispensing with the incline of the roll B as described. I have indicated a simple arrangement of the planishing tool which may advantageously be modified so as to provide in any ordinary manner for convenient adjustment for height. In practice other details of construction and arrangement will be readily modified by an expert and I do not therefore limit myself to the exact construction and arrangement indicated, but:—

What I claim is:—

1. The combination with the rolls B and C arranged to positively rotate in the same direction of the tool K located between said rolls and below their axes, the periphery of the roll B having a downward movement near the tool K and a greater speed than the upwardly moving adjacent periphery of the roll C, substantially as set forth.

2. The combination with the roll C having its axis arranged parallel with the movement of the bar under treatment of the roll B having its axis inclined to that of the roll C, and the tool K arranged to operate in connection with the rolls, said rolls being positively rotated in the same directions with different surface speeds, whereby said bar is simultaneously pressed against said tool and fed onward, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER STEEL.

Witnesses:
ED. A. KELLY,
W. G. STEWART.