(No Model.)

V. E. EDWARDS.

SHEARS.

No. 553,398. Patented Jan. 21, 1896.

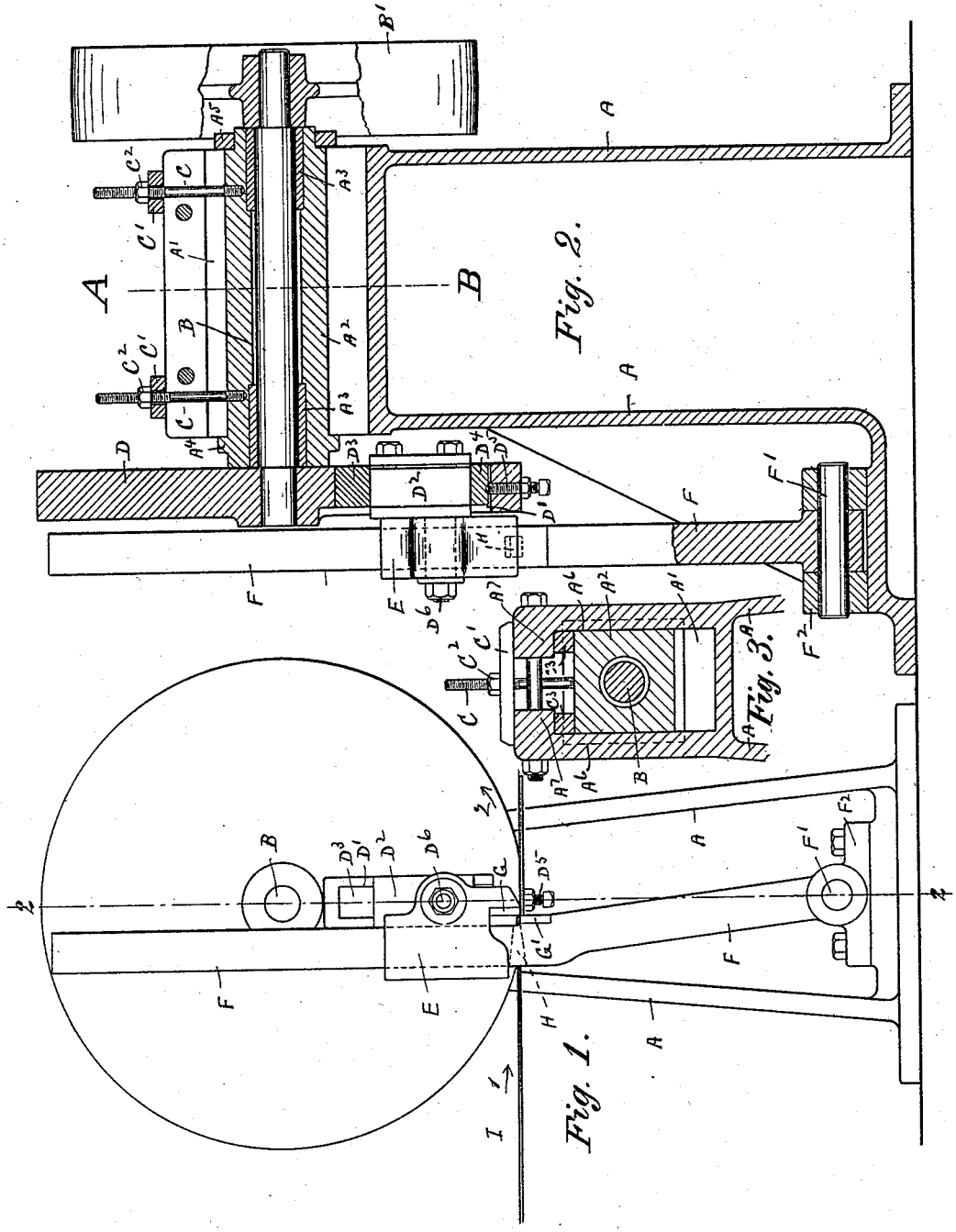

Fig. 2.

Fig. 3.

Fig. 1.

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SHEARS.

SPECIFICATION forming part of Letters Patent No. 553,398, dated January 21, 1896.

Application filed May 7, 1894. Serial No. 510,413. (No model.)

To all whom it may concern:

Be it known that I, VICTOR E. EDWARDS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Shears, of which the following is a specification, accompanied by drawings forming a part of the same, and in which—

Figure 1 represents a side view of my improved shears. Fig. 2 is a central sectional view on line 2 2, Fig. 1; and Fig. 3 is a transverse sectional view of the main driving-shaft and its inclosing sleeve, the section being taken on line A B, Fig. 2.

Similar letters refer to similar parts in the different figures.

The object of my present invention is to provide a shears adapted to sever a moving rod or wire as it is delivered from the rolls of a rolling-mill.

Referring to the accompanying drawings, A denotes an upright framework by which the operating parts of the shears are supported.

In the upper part of the frame A is a chamber A′ adapted to receive a rectangular sleeve A^2 containing the journal-bearings A^3 A^3 for the driving-shaft B. The sleeve A^2 is held from longitudinal movement in the chamber A^2 by means of a flange A^4 and a collar A^5; but the sleeve A^2 is suspended within the chamber A′ by means of the screw-threaded bolts C C, which are attached at their lower ends to the sleeve A^2 and pass through the bars C′ C′ resting upon the top of the frame A. The bolts C carry nuts C^2 which rest upon the upper side of the bars C′ and render the sleeve A^2 capable of vertical adjustment within the chamber A′. The sides A^6 of the frame A, which inclose the chamber A′, are provided at their upper edges with the inwardly-turned flanges A^7 A^7, upon which the transverse bars C′ C′ rest, and between the lower sides of the flanges A^7 and the upper side of the sleeve A^2 are bars C^3 C^3, which fill the space between the flanges and the sleeve when the sleeve has been adjusted vertically by the nuts C^2, which draw the sleeve A^2 firmly against the bars C^3.

The driving-shaft B is rotated through the pulley B′ and a belt connection with any suitable counter or driving shaft, or in place of the belt-pulley B′ other known means of connecting the shaft B with the driving-power can be employed—such, for example, as gearing, a friction wheel or disk or a friction-clutch can be employed—by which the shaft B can be thrown into and out of engagement with the driving-power.

Upon the opposite end of the shaft B is attached a crank-plate D provided with a radial slot D′ in which is held a block D^2 capable of radial adjustment and held in place by the keys D^3 D^4, the radial adjustment of the block D^2 being effected by varying the relative thickness of the keys D^3 and D^4. A tightening-screw D^5 is held in the crank-plate bearing against the outer key D^4 and clamping the key and block D^2 together and against the end wall of the radial slot D′.

Projecting from the face of the block D^2 is a crank-pin D^6, which is journaled within the reciprocating shear-block E. The shear-block E is held by and is capable of a reciprocating motion upon the vertical lever F, which is pivoted by a spindle F′, journaled in a block F^2, attached to the lower portion of the frame A, so that as the crank-plate D revolves an oscillating motion will be imparted to the lever F and also a sliding motion to the shear-block E, the shear-block E upon the oscillating lever F being brought into the position shown in Figs. 1 and 2 when the crank-pin D^6 is in its lowest position.

To the shear-block E, I attach the steel cutting-blade G, and to the oscillating lever F, I attach the steel cutting-blade G′ arranged to act conjointly with the blade G when the crank-pin is in its lowest position, as represented in Figs. 1 and 2.

An opening or hole H is formed in the vertical lever in alignment with the cutting-edge of the lower shear-blade G′, and indicated in Figs. 1 and 2 by broken lines. The rod or wire I, as it is delivered from the rolling-mill and moving in the direction of the arrow 1, is conducted through the opening H in the lever E.

A rotary motion is imparted to the crank-plate D, and at each complete rotation of the crank-plate D the shear-block E is moved up

and down upon the lever F, its lowest position being represented in Figs. 1 and 2, having the edge of the shear-blade G in contact with and overlapping the edge of the lower shear-blade G′, causing the rod I to be severed by the shearing action of the blade G moving in a line parallel with its plane of contact with the blade G′, the continued rotary movement of the crank-plate carrying the upper shear-blade G away from the lower shear-blade G′ and in the direction of the motion of the wire or rod I, as indicated by the arrow 2, Fig. 1, each revolution of the crank-pin sliding the shear-block E up and down, the vertical oscillating lever F, causing the wire or rod I to be successively severed as the crank-pin reaches its lowest position.

In the operation of the machine it is necessary that the movement of the cutting-edge of the blade G in its circular path should be equal, or approximately equal, in speed to the movement of the rod as it is delivered from the rolling-mill in order that the blade G, while in engagement with the rod, may move at the same speed as the rod. Therefore I drive the shaft B at the proper speed to give the same speed to the cutting-blade G in its circular path as is given to the rod I in a straight line by the delivery-rolls of the mill, and the length of the piece severed from the rod will, therefore, be equal to the length of the circular path traveled by the edge of the blade G during a complete revolution of the shaft B. When it is desired to vary the length of the piece cut from the rod, it is accomplished by moving the crank-pin block D^2 within the radial slot D′ and thereby varying the length of the circular path traveled by the cutting-edge of the blade G; but when the crank-pin block D^2 is moved in the radial slot D′ an adjustment of the shaft B becomes necessary in order to bring the cutting-edge of the blade G in proper position to act conjointly with the cutting-edge of the blade G. Therefore I have provided for the adjustment of the driving-shaft B and also for the radial adjustment of the crank-pin block D^2. The adjustment of the shear-blades is effected by the radial adjustment of the crank-pin block D^2 within the slot D′, and an adjustment of the entire crank-plate D is accomplished by raising or lowering the sleeve A^2 in the supporting-framework by means of the adjusting-nuts C^2 C^2.

While I deem the above-described method of changing the length of the piece to be cut from the rod preferable, I am aware that within certain limits and for small rods the length of the piece cut can be changed by varying the speed of the crank-plate D, and consequently the speed of the cutting-edge of the block G, relatively to the speed of the moving rod.

The opening or hole H in the oscillating lever F is preferably made tapering, as indicated by the broken lines in Fig. 1, in order to allow for the angular movement of the oscillating lever.

The means for adjusting the crank-pin block, and also the means for adjusting the shaft B, can obviously be varied without departing from the scope of my present invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a crank-pin, a pivoted bar, a shear-block journaled on said crank-pin and arranged to slide on said bar, a cutting blade carried by said shear-block and an opposing cutting blade arranged to act conjointly with the cutting blade on said shear-block at each revolution of the crank-pin around its axis of rotation, substantially as described.

2. The combination of a crank-pin, a pivoted bar, a shear-block, arranged to slide on said bar and journaled on said crank-pin, a cutting blade attached to said shear-block, and a cutting blade attached to said pivoted bar with the plane of its cutting edge parallel with the line of motion of said shear-block on said pivoted bar, whereby said cutting blades are arranged to act conjointly at each rotation of the crank-pin, substantially as described.

3. The combination of a shear-block capable of a reciprocating motion as actuated by a rotating crank-pin, a rotating crank-pin, journaled in said shear-block, a cutting blade carried by said shear-block, an opposing cutting blade arranged to act conjointly with the cutting blade on said shear-block, said crank-pin being radially adjustable relatively to its axis of rotation, whereby the circular path of the crank-pin is varied, substantially as described.

4. The combination of a crank-pin capable of radial adjustment relatively to its axis of rotation, a pivoted bar, a shear-block journaled on said crank-pin and arranged to slide on said bar, a cutting blade carried by said shear-block, and an opposing cutting blade arranged to act conjointly with the cutting blade on said shear-block at each rotation of the crank-pin, substantially as describe d.

5. The combination of a rotating shaft, a crank-pin carried by said shaft, a shear-block journaled on said crank-pin and arranged to slide on a pivoted bar, a pivoted bar carrying said shear-block, an opposing cutting blade arranged to act conjointly with the cutting blade on said shear-block, said crank pin being radially adjustable relatively to its axis of rotation, whereby its circular path is varied, and said rotating shaft being capable of adjustment whereby the cutting blades are adjusted relatively to each other, substantially as described.

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