2 Sheets—Sheet 1.

J. C. RICHARDSON.

Machine for Upsetting Collars on Vehicle-Axles.

No. 207,208. **Patented Aug. 20, 1878.**

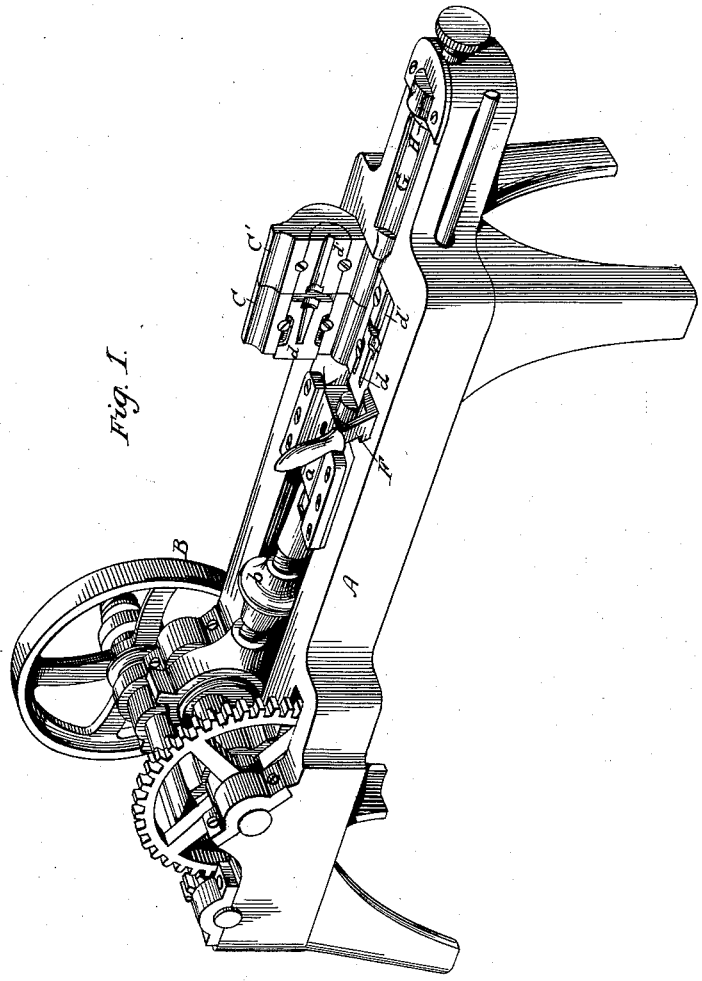

Fig. 1.

Witnesses:

C. Clarence Poole

Richd. K. Evans

Inventor:

Julius C. Richardson

by A. H. Evans & Co.

Attys

J. C. RICHARDSON.

Machine for Upsetting Collars on Vehicle-Axles.

No. 207,208. Patented Aug. 20, 1878.

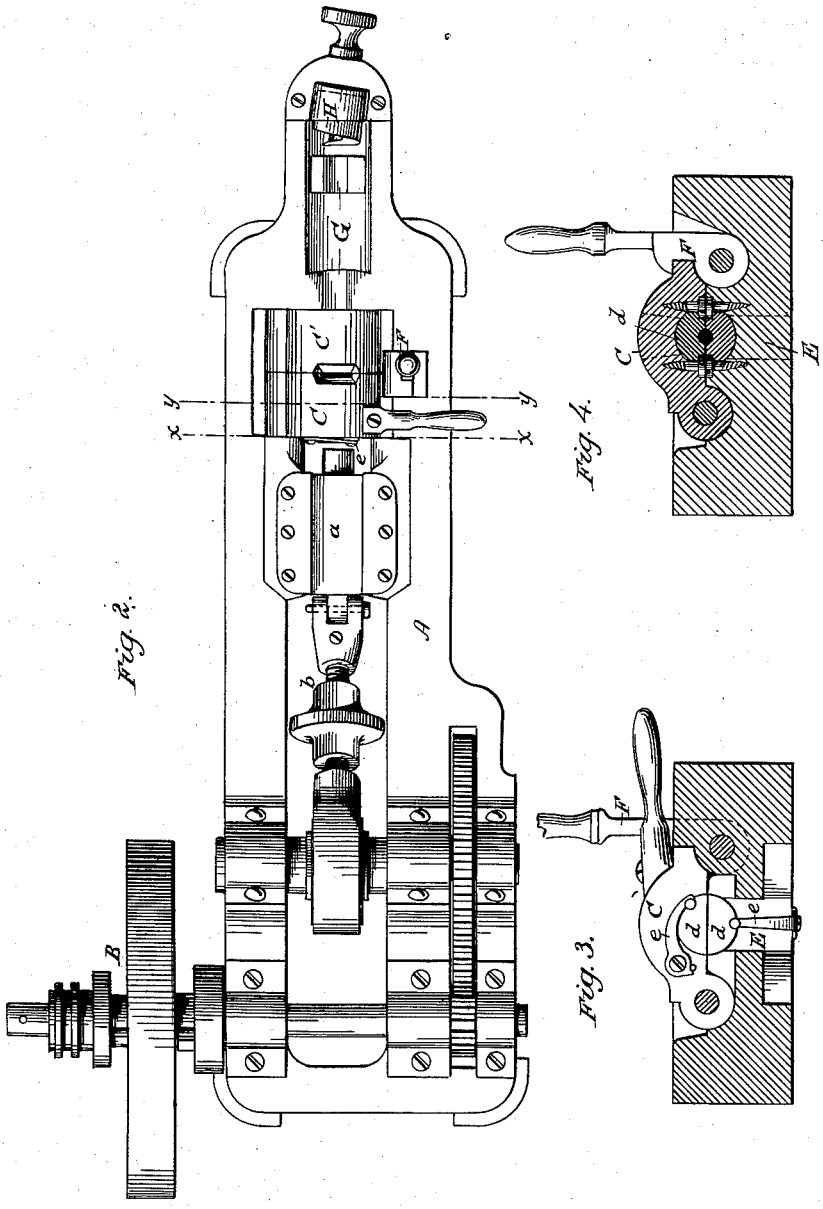

Fig. 2.

Fig. 4.

Fig. 3.

Witnesses:

C. Clarence Poole

Rich K. Evans

Inventor

Julius C. Richardson

by A. N. Evans & Co

Attys.

UNITED STATES PATENT OFFICE.

JULIUS C. RICHARDSON, OF MANLIUS, NEW YORK.

IMPROVEMENT IN MACHINES FOR UPSETTING COLLARS ON VEHICLE-AXLES.

Specification forming part of Letters Patent No. **207,208**, dated August 20, 1878; application filed July 10, 1878.

To all whom it may concern:

Be it known that I, JULIUS C. RICHARDSON, of Manlius, in the county of Onondaga, State of New York, have invented certain Improvements in Machines for Upsetting Collars on Vehicle-Axles, of which the following is a clear, full, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of a machine for the manufacture of axles with my improvements applied. Fig. 2 is a plan view of the same, showing the die-holders closed. Fig. 3 is a vertical cross-section on the line *x x* of Fig. 1. Fig. 4 is the same on the line *y y* of Fig. 1.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

My invention relates to machinery for upsetting collars on vehicle-axles of any kind; and it consists in the combination of devices hereinafter explained and claimed.

In the drawings, A represents the frame-work sustaining the machine; B, the driving-wheel for operating the machinery which drives the sliding hammer *a* through the medium of the adjustable pitman *b*. The die-holders C C′ are hinged to the frame A, and secure in position the compressing-die *d* and holding-die *d′*. Each of these dies is divided longitudinally into two halves, the upper half of each being secured in the hinged die-holders, and the lower half secured to the bed-plate E in the frame A. The holding-die *d′* is rigidly fixed in position in the die-holder, while the compressing-die *d* has a longitudinal movement within the die-holder from and toward the holding-die, being forced more or less to the rear by the springs *e e*, and again carried forward by the sliding hammer *a* during the process of upsetting the collar on the axle.

On the opposite side of the frame to the hinged die-holders is hinged the catch F, which slides over the die-holders and secures them in position during the operation of swaging or upsetting.

In the forward end of the frame-work is the groove G, suitably adapted for holding the bed of the axle. At the outer end of this groove is the cam-faced revolving abutment H, placed at an angle to the line of the groove exactly equal to the angle of the cam formed upon the face, whereby I secure an abutment at right angles to the line of the groove, whatever may be the position of the revolving abutment.

By means of this cam-faced abutment I am enabled to increase or diminish the length of the groove for holding the axle, and thus readily adapt my machine for axles of varying lengths.

In applying my machine to the upsetting of collars on axles, I first take the bar of iron and round a sufficient portion of one end to make the arm and collar of the axle of the exact size for the arm, which is fully inclosed in the sliding dies *d*, the end resting against the interior of the dies *d*, which forms the abutment for the arm end of the axle during the operation of forming the collar. The collar of the axle is made by compressing or upsetting the "round" portion between the sliding dies *d* and the fixed dies *d′*.

The operation of my machine is as follows: The upper section of the die-holders and dies being thrown up, as shown in Fig. 1, the axle is introduced into the machine, the arm end lying on the compressing-die *d*, with the round over the space between the two dies, and the opposite end resting against the abutment H, which is turned in position to accommodate the exact length of the axle-bar. The hinged die-holders, with the holding and compressing dies, are then brought down in position and secured by the catch F. The holding-dies *d′* close around the bed of the axle-blank, holding it firmly in position, while the hammer *a* drives forward the compressing-die *d* and upsets the collar of the axle in the space between the dies. When the die-holders are raised from the catch and thrown up and the

sliding hammer withdrawn, the springs *e e* throw back the compressing-die, and the axle is ready to be lifted from the machine.

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

1. The holding and compressing dies *d d'*, with the hinged die-holders C C', catch F, sliding hammer *a*, and cam-faced abutment H, constructed to operate substantially as and for the purpose set forth.

2. In combination with the holding and compressing dies *d d'*, the cam-faced abutment H, substantially as and for the purpose set forth.

JULIUS C. RICHARDSON.

Witnesses:
PAUL K. LEONHART,
JOHN EWING SPEER.