

R. Marsden.

Rolling Metals.

N^o 83,718.

Patented Nov. 3, 1868.

Fig. 10.

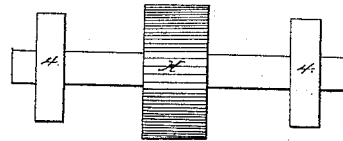
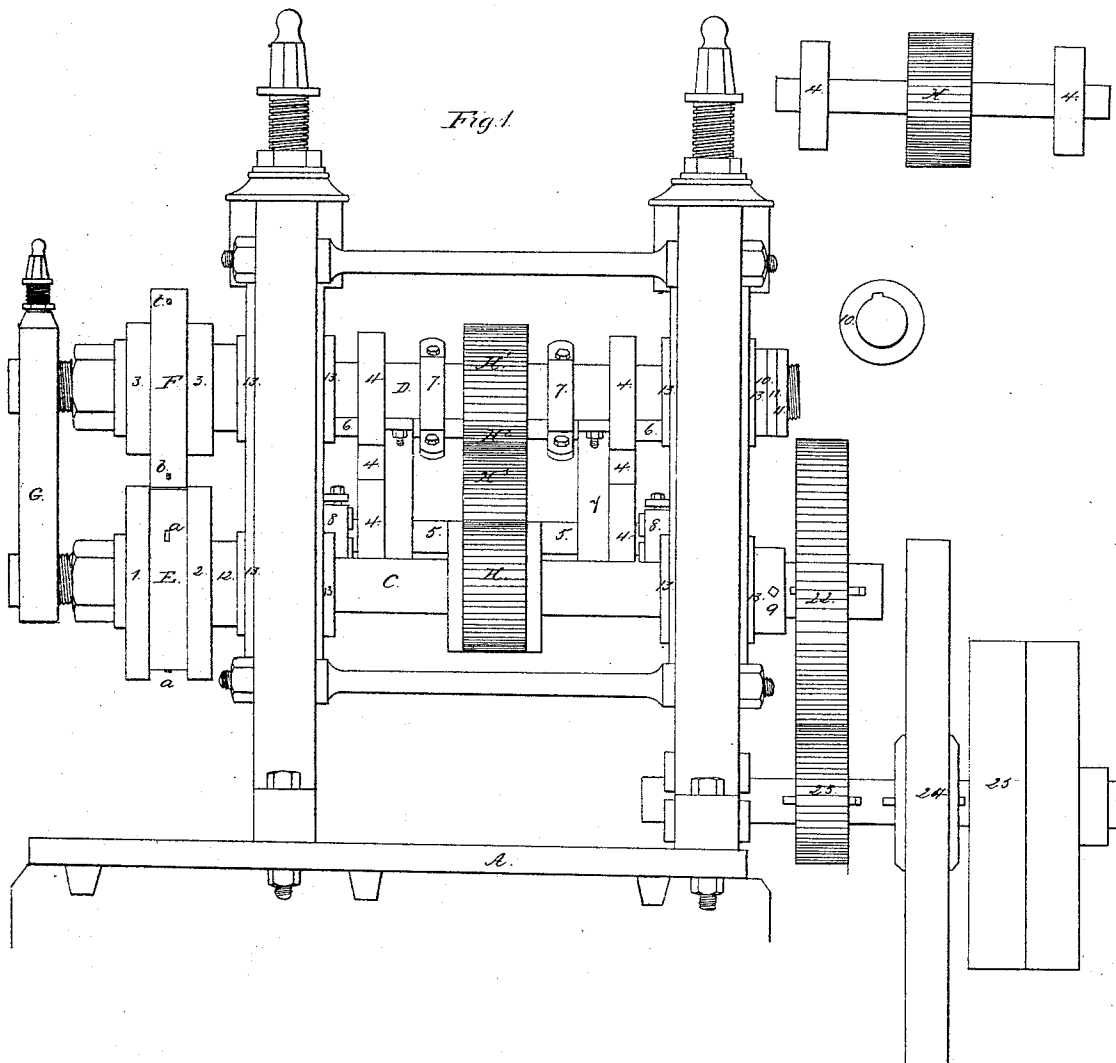


Fig. 1.



Witnesses.

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Sheet 2, 2, Sheets.

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Fig. 2.

Fig. 3.

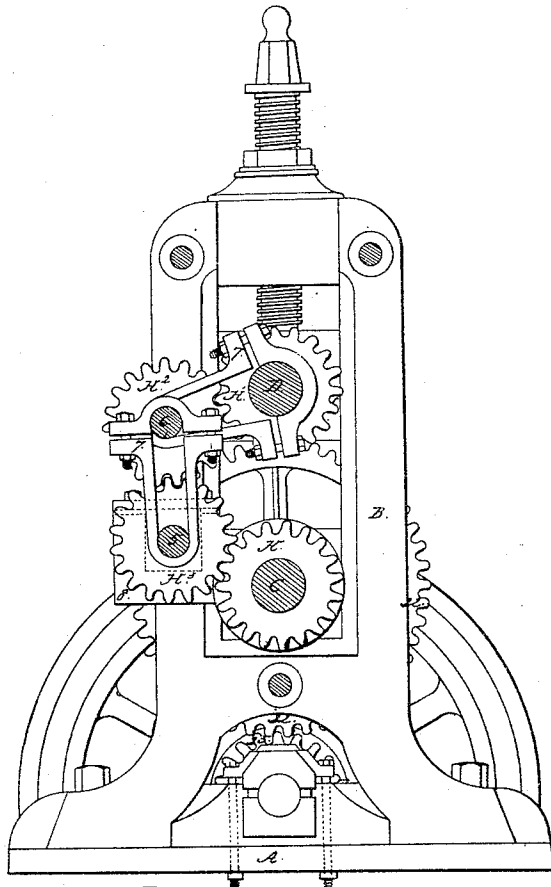
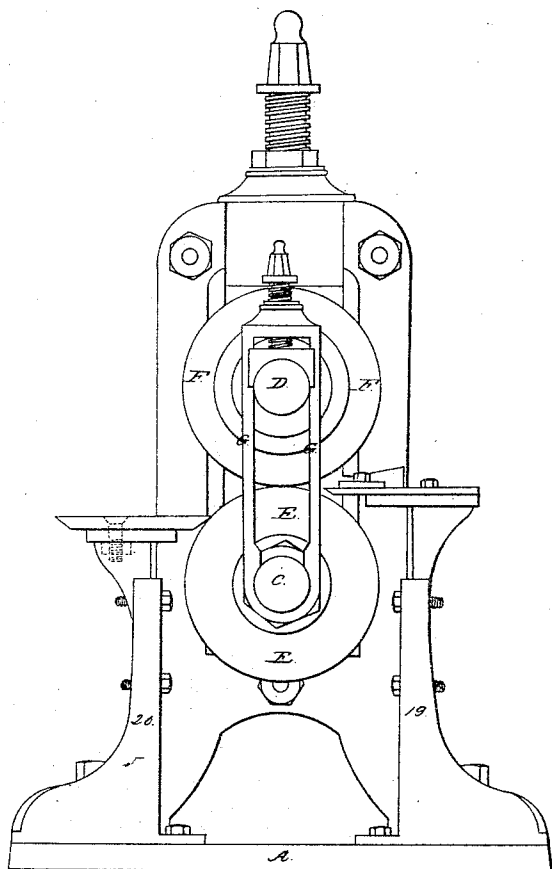


Fig. 6.

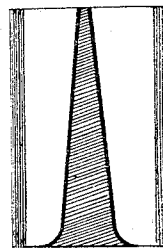
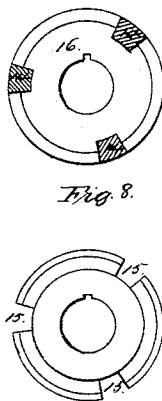
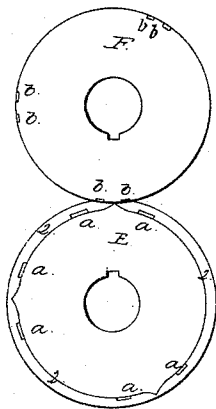
Fig. 7.

Fig. 9.

Fig. 4.

Fig. 8.

Fig. 5.



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United States Patent Office.

ROBERT MARSDEN, OF SHEFFIELD, ENGLAND.

Letters Patent No. 83,718, dated November 3, 1868; patented in England, March 13, 1865.

IMPROVED APPARATUS FOR ROLLING METALS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT MARSDEN, of Sheffield, in the county of York, England, have invented certain Improvements in Machinery or Apparatus for Rolling, Shaping, or Forging Metals; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of my improved machinery;

Figure 2 is an end elevation of the same;

Figure 3 is a transverse section; and

Figures 4, 5, 6, 7, 8, 9, and 10 are views of some of the parts detached.

Similar letters or numbers, in all the figures, refer to similar parts.

This invention relates more especially to the rolling of steel, for producing blanks for files, carriage-springs, and various articles of cutlery, such as pen and pocket-blades, table-knife blades, and similar articles.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same, as follows:

In constructing the die-roll, which, in the present instance, is designed to shape the leaves of elliptic springs, I take a disk or circular plate of steel, of the requisite diameter and thickness to receive a counterpart, either in whole or in part, of the article or articles to be produced, and form, by filing or turning, or by other means, upon this first disk the counterpart or counterparts of so much of them as may be desired. I then take two other disks or plates of steel, of the requisite size, and fit them very accurately, one to each side of the first disk, and then screw them all firmly together, and thus complete the first principal or bottom roll.

In figs. 1 and 4, E represents the first disk, shaped or wrought so as to form the counterpart of three plates or pieces, such as are used in the manufacture of springs for railway-carriages, and it will be seen, by fig. 4, that the disk E is shaped so as to taper the ends, and, by means of the projections *a a*, to form the eye, to receive the steadying-pin, upon the succeeding plates, which will be more clearly seen in the section, fig. 5, showing part of a railway-carriage spring.

In fig. 6, *c* shows the central disk, modified in its contour, so as to produce a blank for a file, while Nos. 16 and 17 show the manner in which the two outer disks are fitted to the central disk.

Having completed, in the above manner, the first or principal roll, I take another disk of steel, of the size required to correspond with and take so much of the counterpart or pattern as was deficient in the first disk, after which the central disk and side plates are screwed or bolted together, as in the former example, thus making, in connection with the former roll, a pair of com-

plete rolls. The manner in which this is performed will be seen by referring to F, fig. 4, and to *d*, fig. 6.

After the parts of each roll have been completed, they should be hardened and tempered, and they are then ready to be attached to the shaft or axle, to be driven and used as an ordinary pair of rolls, as is shown at E and F, fig. 1.

In some cases, each roll will consist of only two disks or plates, instead of three disks or plates, according to the requirements of the pattern or article to be produced.

When there is likely to be a greater amount of wear upon some parts of the roll than upon others, as in the manufacture of blanks for files, I insert a movable piece or boss, shown full size in fig. 9, and reduced at No. 21 in fig. 6, which piece or boss will take as much of the pattern as may be required, and can be replaced, when injured or worn, without detriment to the other part of the roll.

For carriage or other springs, or whenever it may be desired, I also adopt another plan; that is to say, I take an ordinary roll, of the size required, and cut or sink upon the face or circumference, by turning or otherwise, a true counterpart of the spring to be produced. For long springs, simply sink or cut one such pattern, and, for shorter springs, I cut two, three, or more patterns, according to the circumference of the roll, similar to what is shown at E, fig. 4.

As each pair of rolls will be required to be of different diameters, so as to bring into correspondence the patterns impressed upon them, something different from the ordinary driving-gear must be employed, in order to accommodate the different diameters of the rolls. I accomplish this object in the following manner:

To the axle or shaft C, figs. 1 and 3, which carries the principal or bottom roll, I fix a small toothed wheel, H, and fix a similar wheel, H', to the axle or shaft D, which carries the top or second roll. Upon small counter-shafts, Nos. 5 and 6, fig. 3, I attach or fix other toothed wheels, H² H³, of the same size, one of which counter-shafts works in steps or boxes, No. 8, cast upon the standard B, fig. 3, and the other shaft works in bearings in the connecting-loops or rods 7 7, but loose at the ends. The said connecting-loops or rods bring the three wheels, H' H² H³ into gear, and secure the three axles or shafts together, so that, whatever may be the size of the rolls within certain limits, the whole of the toothed wheels will always remain in gear, as shown in fig. 3.

To prevent the toothed wheels from going too deep into gear, I place small rollers, No. 4, fig. 10, upon the three shafts D, 5, and 6, connected together by the loops or rods.

To prevent lateral motion, I use the collar and set-screw 9, fig. 1, on shaft C, and, for the top shaft, D, the washer and check-nuts, marked 10, 11, 11, shown in said figure.

Having described the parts in detail, I will now give a general description of the whole.

In figs. 1, 2, and 3, A represents the bed-plate, upon which the whole machine stands; B B, the standards or frames, which support the different shafts; C, the bottom shaft, carrying the bottom or principal roll, E; D, the top shaft, carrying the top or second roll, F.

G, figs. 1 and 2, is a strong iron strap or coupler, to support the projecting ends of the shafts C and D, and to assist the screws passing through the top of the standards B B in holding the rolls together.

H H' H² H², figs. 1, 3, and 10, are the toothed or spur-wheels used to communicate motion, at the same rate, from the shaft C to the shaft D.

No. 8, fig. 3, are the steps or boxes, which hold the counter-shaft 5 in the proper position to the shaft C; 7 7, the connecting-loops, which hold the other shafts together, seen clearly in fig. 3.

No. 4, figs. 1 and 10, are the small roller-wheels, which prevent the toothed wheels from running too deeply into gear.

13, fig. 1, are the steps or boxes in which the two principal shafts work, which steps or boxes are made of iron, and case-hardened, and are accurately fitted to the shafts, and also to the openings on the standards B, in which they are required to be placed.

Nos. 9, 10, and 11, fig. 1, are collars and check-nuts, to hold the shafts to their places.

No. 22, figs. 1 and 3, is a large spur-wheel, with a small wheel, 23, geared into it.

24 is the fly-wheel.

25 is the loose pulley and driving-drum, by which the whole machinery is put in motion.

Nos. 19 and 20, fig. 2, are standards for supporting-tables, for guiding the bars to and from the rolls.

The devices numbered 22, 23, 24, and 25 may be dispensed with, and the machine coupled, if advisable, by the end of the shaft C, to an ordinary train of rolls.

By reference to fig. 8 will be seen the manner in which the inner plate or disk is formed, with the opening to receive the boss or movable piece, represented in fig. 9, while fig. 7 shows, at No. 14, the manner in which the boss or movable piece is sunk in the outer plate, No. 16, the whole being shown in position, fig. 6, where the boss is marked 21.

In fig. 4, the disk E, placed against the inside of the plate 2, shows the manner in which the tapering form is given to the end of the spring-plates, fig. 5, and which may be made to extend to any distance along the plate, while the small projections *a*, figs. 1 and 4, show the manner in which the eyelets are formed in the under part of the spring, to receive the steadying-pin of the next succeeding plate.

In the upper disk, F, figs. 1 and 4, there are small cavities, *b*, into which the metal is pressed, as it passes through the rolls, for making the steadying-pins on the upper side of the plate or spring at the same time, and corresponding with the cavity or eyelet formed by the projections on the bottom disk or roll, both of which are shown, in the section of a spring, at fig. 5.

Having now described the nature and particulars of my invention, and the manner in which the same is to be performed, I desire it to be understood that

I claim as my invention—

The mode described of combining the two shafts by means of the toothed wheels, and rollers, and counter-shafts, connected by loops or rods, substantially as specified.

In witness whereof, I, the said ROBERT MARSDEN, have hereto set my hand, this 1st day of December, A D. 1865.

ROBT. MARSDEN.

Witnesses:

WM. H. SMITH,
JOSEPH WOLSTENHOLME.