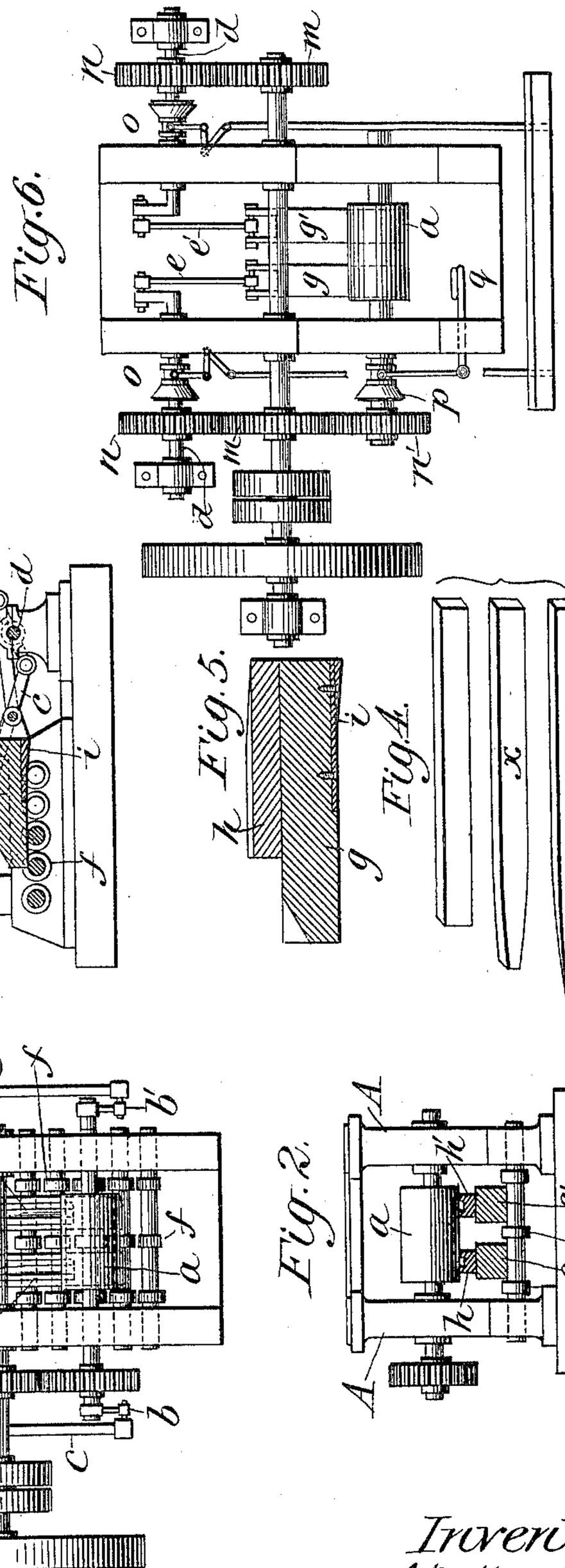
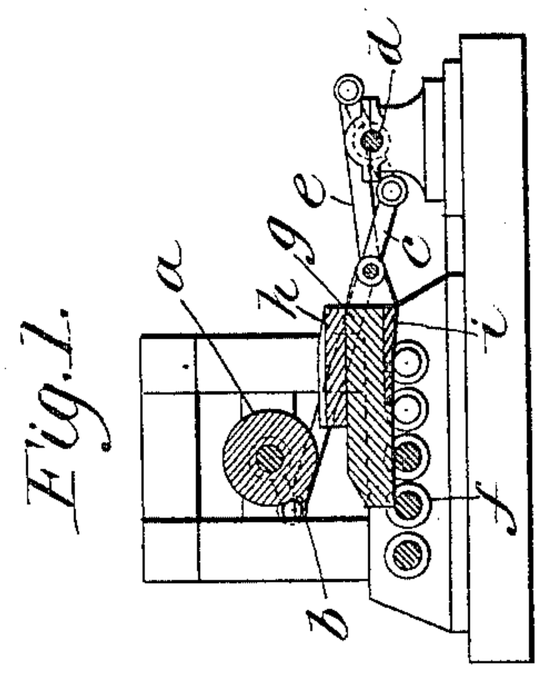
(No Model.)

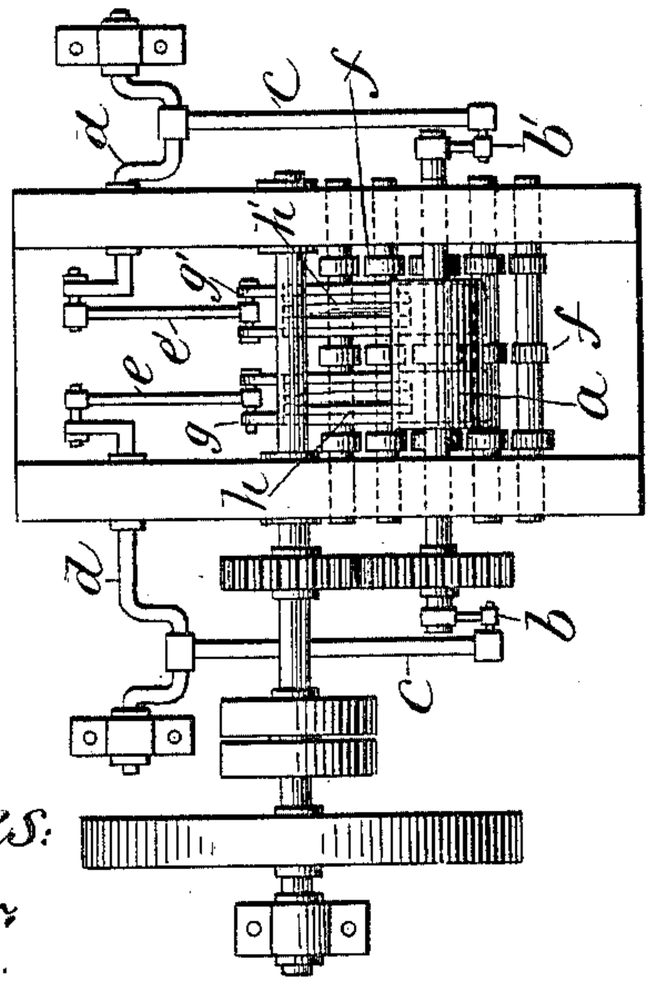
W. GROSS.

ROLLING MILL FOR ROLLING OUT FILE BLANKS, &c.

No. 581,820. Patented May 4, 1897.







Witnesses:
Emil Bæger.
Rudolf Freichal.

Inventor:
Walther Gross
per Richard Neumann
Attorney.

UNITED STATES PATENT OFFICE.

WALTHER GROSS, OF EHRINGHAUSEN, GERMANY.

ROLLING-MILL FOR ROLLING OUT FILE-BLANKS, &c.

SPECIFICATION forming part of Letters Patent No. 581,820, dated May 4, 1897.

Application filed February 24, 1896. Serial No. 580,581. (No model.) Patented in Germany October 14, 1894, No. 83,485.

To all whom it may concern:

Be it known that I, WALTHER GROSS, a subject of the King of Prussia, German Emperor, residing at Ehringhausen, near Remscheid, in the Kingdom of Prussia, Germany, have invented a new and useful Rolling-Mill for Rolling Out File-Blanks and other Work-Pieces, (for which I have obtained a patent in Germany, No. 83,485, bearing date October 14, 1894,) of which the following is a specification.

The purpose of the invention is principally to in the simplest manner manufacture file-blanks by rolling, so as to not require much finishing. In this process the point will be that the metal to be used is not only drawn out and pressed in a matrix in order to thus produce the file, but it must also be considered that toward its end the work-piece should run to an oval conical point, for which purpose the matrix while passing under the roller must be given a peculiar gradually-inclining movement.

Figure 1 of the accompanying drawings is a vertical section. Fig. 2 is part of the front view, and Fig. 3 is a view from above. Figs. 4 and 5 show single parts, and Fig. 6 is a modification.

A pair of supports A are holding a smooth roller *a*, which is worked from any source of power. By means of crank-levers *b b'* and rods *c* or otherwise the said roller *a* turns two crank-shafts *d*, which on their part, for instance, by cranks and connecting-rods *e e'*, move two sliding carriages *g g'*, which are guided on rollers *f* forward and backward. Thus by means of the transmission of movement described the movement of the sliding carriages is independent of that of the roller. On each of the sliding carriages an exchangeable matrix *h* and *h'*, respectively, are fixed, which contain the section of the piece to be rolled, in which when the sliding carriages pass under the roller the metal is pressed and at the same time rolled out toward the end of the section, so that in this way the work-piece is produced as intended. The section of matrix *h* is according to the file form *x*, and that of matrix *h'* is according to file form *y*, Fig. 4, because in a rolling process the metal would not roll out right into the point of the matrix.

Now as it is necessary for file-blanks that all the sides of the tool should run to an oval conical point it is not possible to give the matrices a level surface, as otherwise the piece produced would afterward require straightening. In order to avoid this, the matrices have been beveled toward the point of the section, and, in order to nevertheless obtain the necessary constant contact between the roller and matrices while the latter are passing through, the rear end of the matrices is given a gradually-inclining movement during the rolling—viz., by the following arrangement: In the lower surface of each of the sliding carriages in a hollow of the same a wedge *i* is provided by means of countersunk screws, of which the inclination is contrary to the conicalness of the file end and the beveling of the matrices and must have the same dimensions as the latter. When the sliding carriages thus arranged pass with the matrices under the roller, the matrices will continue to advance in level surface until the wedges begin to incline or until where the beveling of the matrices begins to pass under the roller. From then the matrices will gradually incline, according to the said beveling, and so continue, as may be required by the conicalness of the work-piece to be produced. In this way a ready file work-piece is obtained every time the sliding carriages pass. The conicalness can be altered according to the choice of the wedge and the matrices.

In working with the arrangement illustrated by Figs. 1 to 3 a bad friction takes place between the matrices and the roller when passing back, during which the roller keeps up its turning direction. In order to avoid this, the arrangement shown by Fig. 6 has been made, according to which the roller is automatically disengaged at the proper moment, and while passing back the sliding carriage is carried along in opposite direction. In this case the shafts *d* and the roller *a* are worked by tooth-wheels *m*, *n*, and *n'*, and the movement of the sliding carriages *g g'* is effected, as formerly, by the rods *e e'*. At *o* couplings are arranged on the shafts *d*,

which can be engaged or disengaged by a foot-gear, while at *p* the roller-shaft is provided with a coupling which is disengaged by means of a lever *q* by the advancing sliding carriages. This having taken place, the roller is easily carried along in opposite direction when the sliding carriages go back, so that friction is avoided. By means of couplings arranged at *o* the crank-shafts can be put out of gear after every rolling period, independent of the driving-shaft, in order to obtain sufficient time for quietly placing the work-piece into the matrices. The arrangement could also easily be made so that each sliding carriage can pass under the roller by itself.

As the case may be, the connecting-rods or tooth-wheels for the roller could also be left out and the latter be arranged loosely by itself, only giving impulse to the sliding carriage, so that as the sliding carriage and roller firmly touch each other the latter must automatically turn when the sliding carriages advance and return.

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

In a rolling-mill for rolling out files and other work-pieces the combination of a firmly-supported, driven upper roller *a*, roller sliding carriages *g g'* each carrying a matrix, means for moving said carriages to and fro beneath the driven roller, inclined wedge-shaped pieces *i i'* secured to said carriages, and the bearing-rollers supporting said carriages, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WALTHER GROSS.

Witnesses:
SOPHIE NAGEL,
WILLIAM H. MADDEN.