No. 813,071. PATENTED FEB. 20, 1906.

J. ABBOTT.

METAL CUTTING MACHINE.

APPLICATION FILED OCT. 11, 1904.

Fig. 1

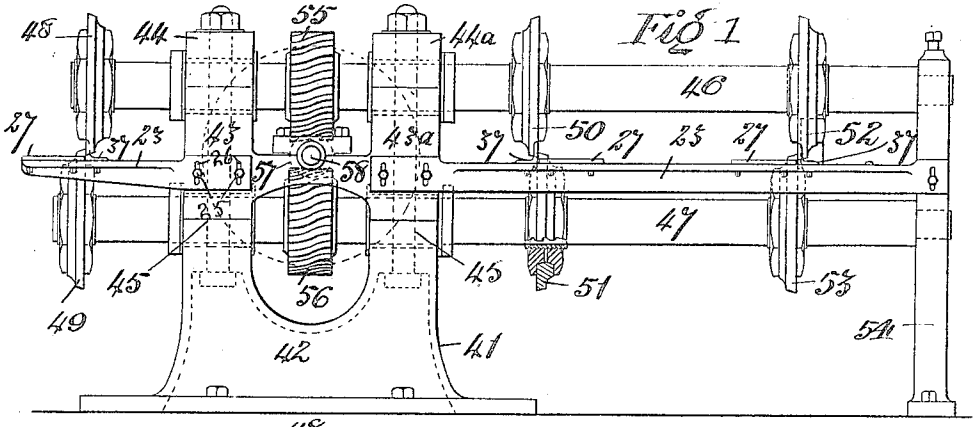


Fig. 2.

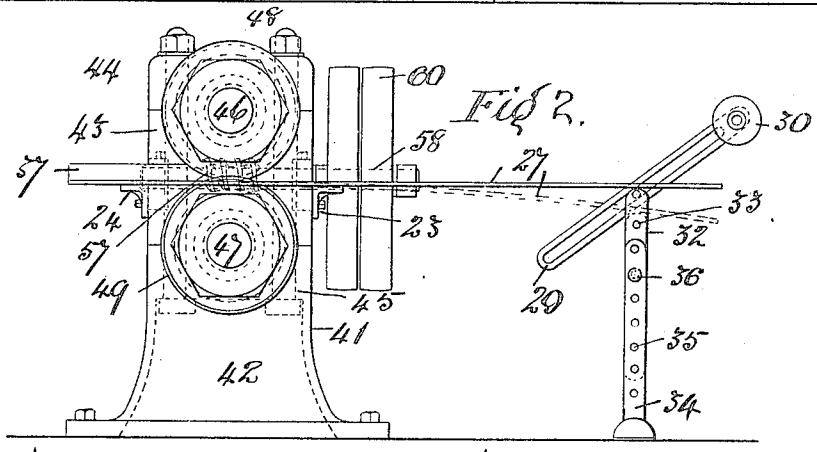
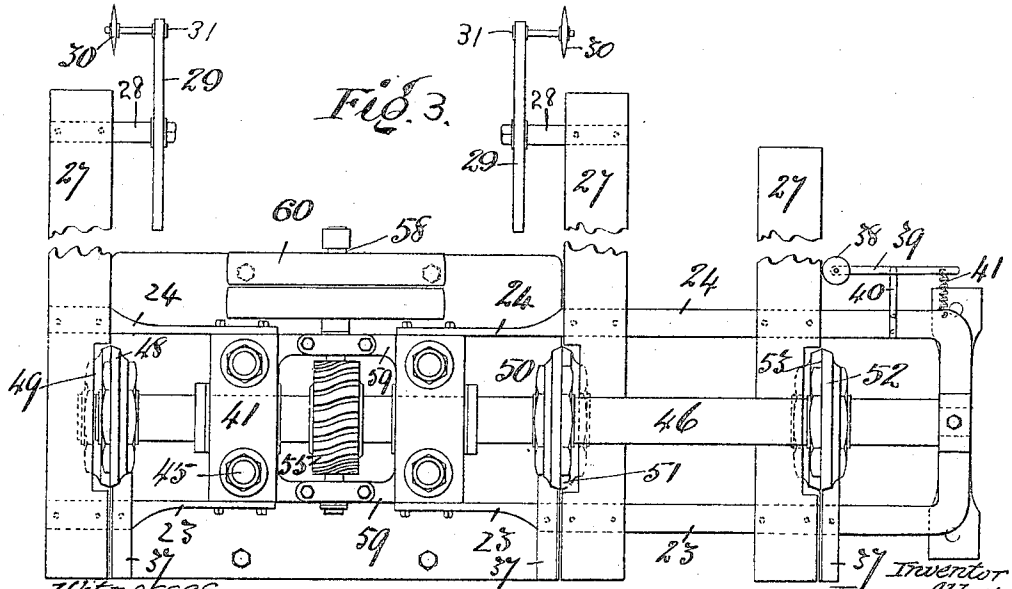


Fig. 3.



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JAMES ABBOTT, OF NEWPORT, ENGLAND.

METAL-CUTTING MACHINE.

No. 813,071. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed October 11, 1904. Serial No. 228,038.

To all whom it may concern:

Be it known that I, JAMES ABBOTT, a subject of His Majesty the King of Great Britain, residing at Daleside, 70 Caerau road, Newport, Monmouth county, England, have invented certain new and useful Improvements in Metal-Cutting Machines, (for which I have obtained Letters Patent in Great Britain, No. 22,867, dated October 22, 1903; in Belgium, No. 177,025, dated May 3, 1904, and have made applications for patents in Germany, dated May 10, 1904; in France, Serial No. 207,316, dated May 10, 1904, and supplementary application in Great Britain, No. 19,906, dated September 15, 1904,) of which the following is a specification.

My invention has reference to improvements in and relating to machines for cutting or shearing off the rough edges of metal sheets, plates, and the like and dividing one sheet or plate into two or more smaller sheets or plates, having for its objects to provide, more especially for heavy work, a construction of machine whereby the distance between the knives and cutters may be regulated without the necessity of adjusting these, and more especially for light work to provide a slightly-modified and inexpensive construction of machine for superseding the usual hand-shears.

Further objects of the present invention are to provide means whereby the operator may see when he has a plate in the desired position and at the same time be able to judge the amount of scrap it is desirable to cut off, and means whereby the plates or the like may be kept straight while being cut and the cutting operation facilitated in the case of plates or the like which may be more or less curved or buckled, according to the state of the mill-rolls when the plates are being rolled.

Referring to the accompanying drawings, Figures 1, 2, and 3 are respectively front, side, and plan views of my invention.

In carrying out my invention I employ a pair of fixed standards or a U-shaped standard 41, comprising a base portion 42 and removable portions 43 43^a and 44 44^a, connected together by bolts 45 or by any other convenient means. Between said portions are borne one immediately above the other a pair of rods or shafts 46 and 47, which for preference are extended farther on one side of the standard 41 than on the other, although, if desired, the shafts may project equal distances on both sides. On the shorter projecting portions of the rods or shafts are mounted a pair of circular cutters 48 49, while on the longer projecting portions of the rods or shafts are mounted a plurality of pairs of cutters. In the example given two pairs—50 and 51, 52 and 53—are shown for the purpose of cutting off the two edges of a sheet or plate simultaneously; but if it is desired to divide the sheet or plate into two or more smaller sheets or plates one or more further pairs of cutters would be added. These knives are preferably of the type and removably fixed in the manner set forth in my previous application for Letters Patent, Serial No. 207,316, dated May 10, 1904. As shown, the cutters are arranged so that the cutting edges of each pair are in close proximity and overlap the desired distance at the cutting-point.

For additional support the outer ends of the longer portions of the rods 46 and 47 are arranged to receive a loose standard 54, so that this may be quickly slipped off the ends of the shafts to facilitate the changing of the cutters or addition of more.

Between the members of the U-shaped standard 41 worm-wheels 55 and 56 are respectively mounted upon the rods or shafts 46 and 47 and arranged in gear with a worm 57, the shaft 58 of which is borne by the cross-pieces 59, integrally connecting the central portions 43 43^a of the standard 41. Upon the said shaft 58 may be mounted a pair of fast and loose pulleys 60, or a motor may be arranged to drive the shaft 58 direct, if desired.

Adjacent to each pair of cutters, as shown, are provided brackets 23 and 24, adjustably attached to the front and back of the standard 41 by means of bolts 25, which pass through slots 26 in the brackets and are screwed into threaded holes in the standard, by which means the slackening of the bolts permits the brackets to be raised or lowered to accommodate the thickness of the plates or sheets to be cut. Each pair of such brackets 23 and 24 are extended a suitable distance beyond the cutters, and on such extended portions adjacent each pair of cutters is suitably fixed, as by bolts or the like, supporting plates or platforms 27. The forward end of each plate or platform is provided with a projecting part 28, carrying a slotted arm 29. To one end of said arm is connected a marking-disk 30, situated in line with the cutting edges of the cutters and which by loosening the nut 31 and manipulating the arm 29 can

be moved farther away from or nearer to the cutters and the supporting-platform 27, as may be desired.

As shown in Fig. 2, the forward end of each platform 27 has pivotally connected thereto a link or member 32, provided with a series of holes 33, while to the foundation or other support of the machine is hinged or fixed adjacent to said link 32 a second member 34, provided with a series of holes 35 for permitting a pin 36 to be passed through one or the other thereof and engage with one or the other of the holes in the link 32, thereby allowing the supporting-platform 27 to be adjusted from a straight position, as shown in full lines in Fig. 2, to the curved position, (shown in dotted lines,) which may be desired when the plates are buckled, as hereinbefore referred to.

Upon each pair of brackets 23 and 24 and immediately adjoining the outside edge of each platform 27 is fixed an angle-iron guide 37, the inner surface of which is in line with the cutting edges of the cutters, so that as the plate passes through the cutters each trimmed edge of said plate bears against each angle-iron guide 37, and the plate is guided true and straight in consequence thereof.

In addition to the guides 37 I may provide a pair of guide-rollers 38 to assist the operator in adjusting the sheet or plate on the platform 27. Each of such guide-rollers is mounted at the outside of each platform 27 upon an arm 39, pivotally connected to an arm 40, attached to a bracket 24, said arm 39 being connected at the end opposite to that carrying the roller to a spring 41, which is also fixed to the bracket 24. Such provision of spring-controlled arms 39 permits the rollers 38 to be deflected by any excessive irregularities of the rough edges of a sheet or plate, which said excessive irregularities would otherwise impinge against said rollers and prevent the sheet or plate from passing through the cutters.

In use such a machine, as illustrated by Figs. 1, 2, and 3, may be employed on one side as a single cutter in lieu of the ordinary hand-shears, and on the other side as a double cutter for cutting off two rough edges of a sheet simultaneously.

Obviously both sides of the machine may be arranged as single cutters or as double cutters, and by removing the loose standard 54 in the machine shown the cutters 50 51 and 52 53 may be replaced by others, or further cutters may be added for the purpose herein specified.

After the platforms 27 have been adjusted to suit the condition of the plate to be cut the operator places one of the sheets or plates upon the platforms 27 and inserts one end of the plate between the guide-rollers 38 up to the cutters. He then raises the other end of the plate to the marking-wheels 30 in order to judge the amount of scrap to be cut off from each side of the plate, and then said plate is pressed forward to the cutters, and these receiving motion through their gearing will cut or shear off the rough edges of the sheet or plate and automatically feed the trimmed plate forward between the guides 37, which, as before stated, serve to insure the plate traveling straight while being cut. The embodiment of this feature of guiding the plates true is of the utmost importance, as otherwise the majority of the sheets or plates would be spoiled in the cutting operation owing to the tendency of the plates in passing through the cutters to get out of true, and consequently the trimmed edges are not parallel and more scrap is taken off one side and less off the other side than is desired.

For accommodating curved or buckled plates it is also highly important that the platforms 27 may be adjusted as stated, as platforms of a fixed horizontal type are not suitable for use with such curved or buckled plates.

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

1. A machine for cutting or shearing metal sheets or plates comprising a standard, a pair of shafts borne thereby, said shafts projecting on either side of said standard and on one side each shaft carrying a single circular knife or cutter and on the other side a plurality of circular knives or cutters with means for rotating said shafts substantially as described.

2. A machine for cutting or shearing metal sheets or plates, comprising fixed and loose standards, a pair of shafts borne thereby and projecting unequal distances on either side of said fixed standard, the shorter projecting portions of said shafts respectively carrying a single circular knife or cutter and the longer portions of said shafts respectively carrying a plurality of circular knives or cutters, with suitable gearing in connection with said shaft substantially as described.

3. A machine for cutting or shearing metal sheets or plates, comprising fixed and loose standards, a pair of shafts borne thereby and projecting unequal distances on either side of said fixed standard, the shorter projecting portions of said shafts respectively carrying a single circular knife or cutter and the longer portions of said shafts respectively carrying a plurality of circular knives or cutters, with suitable gearing in connection with said shafts and means for supporting and guiding the sheets or plates and regulating the amount of scrap to be cut off substantially as described.

4. A machine for cutting or shearing metal sheets or plates comprising a standard, a pair of shafts borne thereby said shafts projecting on either side of said standard, and on both

sides each shaft carrying a single circular knife or cutter, with suitable gearing in connection with said shafts, and means for supporting and guiding the sheets or plates, and regulating the amount of scrap to be cut off substantially as described.

5. A machine for cutting or shearing metal sheets or plates comprising fixed and loose standards, a pair of shafts borne thereby, said shafts projecting on either side of said fixed standard, and on both sides each shaft carrying a plurality of circular knives or cutters, with suitable gearing in connection with said shafts, and means for supporting and guiding the sheets or plates and regulating the amount of scrap to be cut off substantially as described.

6. In means for cutting or shearing metal sheets or plates, the combination therewith of supporting guiding and regulating mechanism for the sheets or plates consisting of brackets adapted to be adjustably connected to the standards and support adjacent to each pair of cutters, a platform and guide, each of said platforms having adjustably fixed thereto at its forward end a slotted arm carrying a marking-disk, substantially as described.

7. In means for cutting or shearing metal sheets or plates the combination therewith of supporting guiding and regulating mechanism for the sheets or plates consisting of brackets adapted to be adjustably connected to the standards and support adjacent to each pair of cutters, a platform, angle-iron guide, and a spring-controlled arm carrying a guide-roller, each of said platforms having adjustably fixed at its forward end a slotted arm carrying a marking-disk, substantially as described.

8. In means for cutting or shearing metal sheets or plates, the combination therewith of supporting, guiding and regulating mechanism for the sheets or plates consisting of brackets adapted to be adjustably connected to the standards and support adjacent to each pair of cutters, a platform, angle-iron guide and a spring-controlled arm carrying a guide-roller each of said platforms having adjustably fixed at its forward end a slotted arm carrying a marking-disk, said forward end of each platform (for adjusting this to the condition of the plates) also having pivoted thereto a link provided with a series of holes adapted for adjustable connection by a pin or bolt to a member having a like series of holes, said member being connected to the foundation or other support of the machine substantially as described.

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

JAMES ABBOTT.

Witnesses:
HENRY CONRAD HEIDE,
ALBERT GEORGE BARNES.