F. E. MUNSCHAUER.

GAGE FOR SHEET METAL SHEARS, &c.

APPLICATION FILED APR. 28, 1919.

1,345,802.

Patented July 6, 1920.

2 SHEETS—SHEET 1.

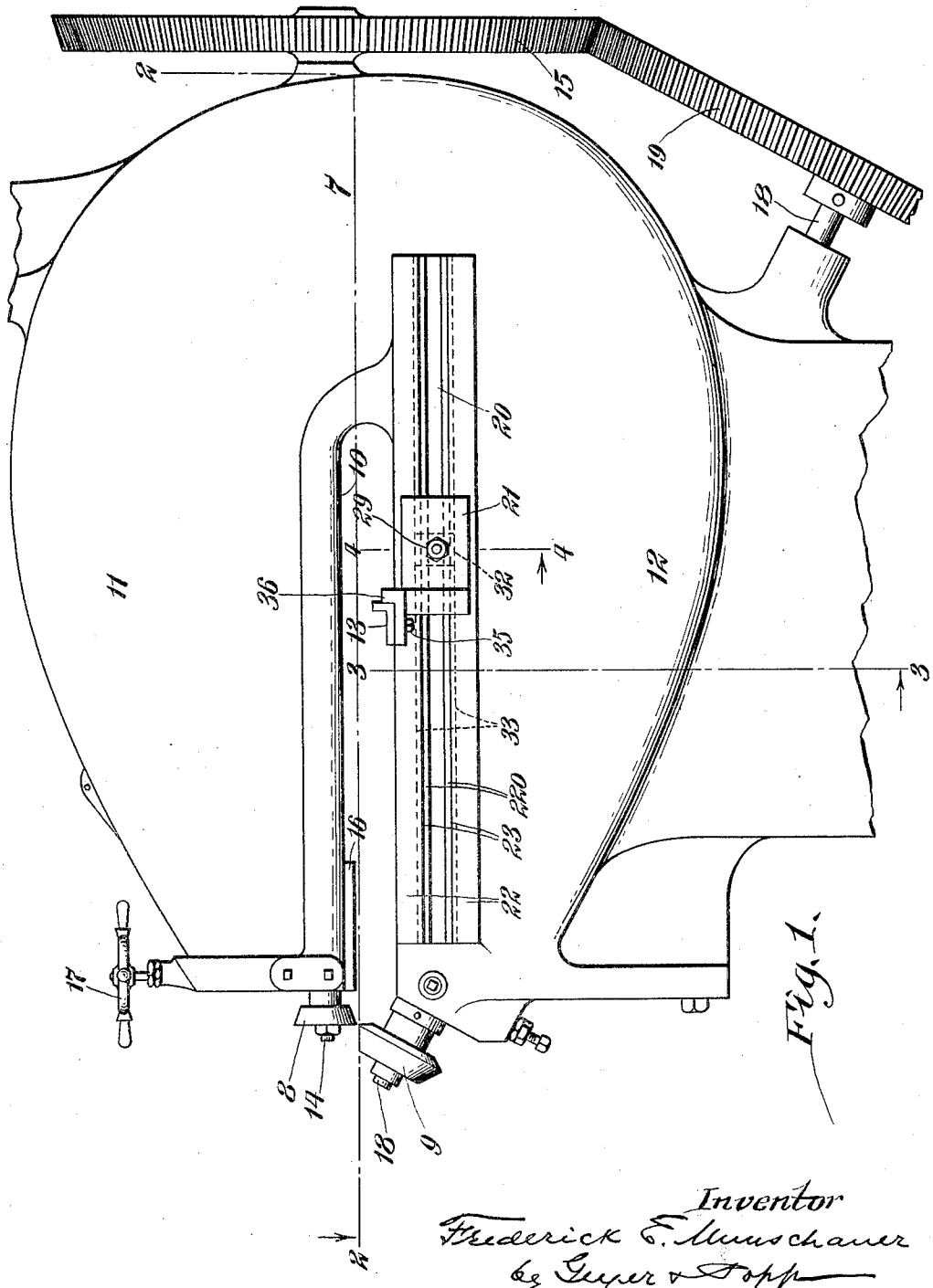


Fig. 1.

Inventor
Frederick E. Munschauer
by Geyer & Popp
Attorneys

F. E. MUNSCHAUER.

GAGE FOR SHEET METAL SHEARS, &c.

APPLICATION FILED APR. 28, 1919.

1,345,802.

Patented July 6, 1920.

2 SHEETS—SHEET 2.

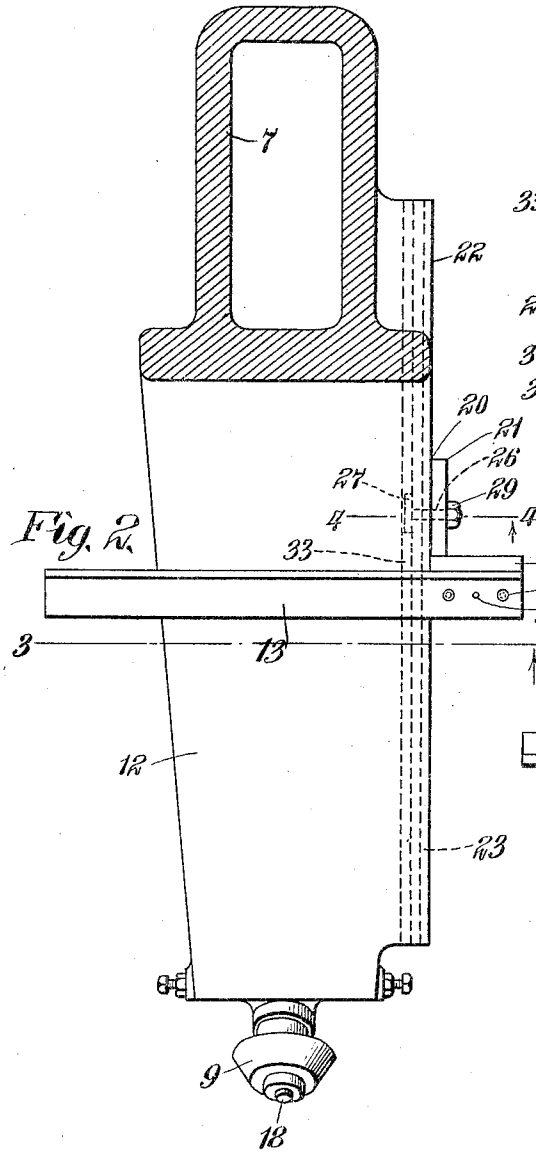


Fig. 2.

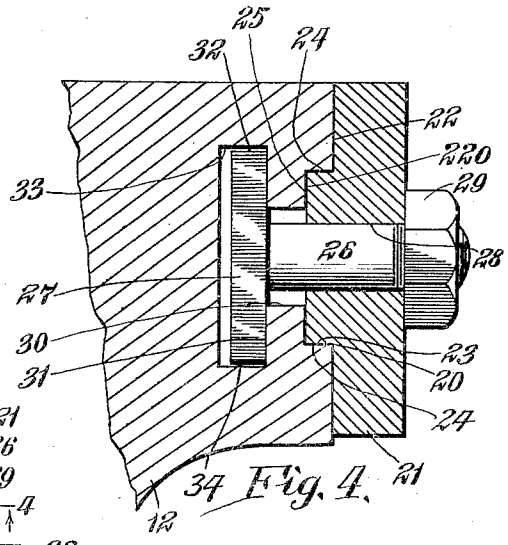


Fig. 4.

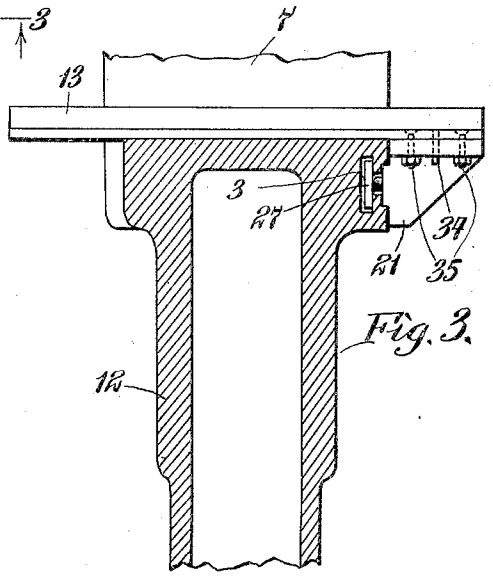


Fig. 3.

Inventor

Frederick E. Munschauer

by Lyon & Popp

Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK E. MUNSCHAUER, OF BUFFALO, NEW YORK, ASSIGNOR TO NIAGARA MACHINE & TOOL WORKS, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

GAGE FOR SHEET-METAL SHEARS, &c.

1,345,802. Specification of Letters Patent. Patented July 6, 1920.

Application filed April 28, 1919. Serial No. 293,369.

To all whom it may concern:

Be it known that I, FREDERICK E. MUNSCHAUER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Gages for Sheet-Metal Shears, &c., of which the following is a specification.

This invention relates to a positioning gage for machines operating on sheet metal, whereby the work piece which is being fed into the machine, can be kept at a predetermined distance from the cutting mechanism. This gage is more particularly adapted for guiding straight-edged sheets of metal while the same are being fed through a rotary shearing machine, for the purpose of cutting the same down a straight line.

The object of the invention is to provide a simple and inexpensive gage of this character, which will stand the heavy strains which it receives in actual shop practice, without being thrown out of adjustment thereby, and yet permits of a single, convenient adjustment.

In the accompanying drawings:

Figure 1 is a fragmentary side elevation of a rotary shears with my improved gage applied thereto. Fig. 2 is a horizontal section thereof, taken on line 2—2, Fig. 1. Fig. 3 is a fragmentary vertical section taken on line 3—3, Fig. 2. Fig. 4 is an enlarged vertical section taken on line 4—4, Fig. 2.

Similar characters of reference indicate corresponding parts throughout the several views.

This improved gage may be used in conjunction with various kinds of machines for operating on sheet metal, but a typical application thereof is shown, as the same would be applied to a straight-cutting, rotary, metal shears. In its general organization, this rotary shears comprises a main frame 7 in which is mounted a pair of rotary cutting heads, wheels or disks 8 and 9, respectively, between which the sheet metal work piece is passed and is given a shearing cut, while said work piece extends into a gap or opening 10 formed between the upper and lower arms 11 and 12 of the main frame of the shears and is adapted to bear against the wear strip 13 of my improved gage, so as to guide the same during the cutting operation. Thus, as one of the straight edges of the work piece is held against and guided by said wear strip 13, the work piece is moved transversely through the machine and the cutting heads cut or shear through the metal on a line which is parallel to said straight edge. The upper cutting head 8 is secured to a horizontal drive shaft 14 which is journaled in the main frame 7 and carries a bevel gear 15 at its rear end and is rotatably mounted near its forward end in a vertically slidable carriage 16 whose movement is governed by means having an adjusting hand wheel 17. The lower cutting head 9 is secured to a driven shaft 18 which is also journaled in the main frame and carries at its rear end, a gear 19, in mesh with the upper gear 15. Thus the two cutting heads are caused to rotate in opposite directions, so that the metal sheet is drawn in between the heads and given a shearing cut.

Arranged horizontally on the front face of the shearing machine is a guideway or slot 20 which is preferably integral with the frame of the machine and upon which a gage or guide block 21 may be adjustably moved longitudinally and clamped thereto at any desired point. The guide block 21 bears with its rear face against vertically disposed upper and lower clamping faces 22 forming the front face of the guide 20. To prevent the guide block 21 from skewing on the slide, the latter is provided with horizontal alining faces 23 extending inwardly from the inner edges of the clamping faces and arranged to bear against a pair of horizontal alining shoulders 24 which are preferably formed integrally on the rear part of the guide block 21. The rear face 25 of said guide block intermediate of the alining shoulders 24, may, if desired, bear against supplemental clamping faces 220, which are arranged on the guide intermediate of the horizontal alining faces 23.

The guide block is clamped to the guide 20 by means of a horizontal T-headed clamping bolt 26, which is preferably provided on its inner end with a large rectangular head 27. The shank of the bolt passes loosely through a hole 28, formed horizontally in the guide block, and a nut 29 is screwed on the outer end of the shank and bears inwardly against the outer face of the guide block 21 and thereby clamps the same to the guide 20. The head 27 of the bolt is arranged to slide in a longitudinal clamping slot 30 which is preferably of T-shaped

cross-section and integral with the shears frame, and is arranged intermediate of the supplemental clamping faces 220 and extends inwardly therefrom. The inner flat face of the rectangular head 27 of the bolt is arranged to bear against two vertical clamping ledges 31 of the T-shaped clamping slot, so that when the nut 29 of the clamping bolt is tightened against the clamping block 21, the head of the bolt is forced against said clamping ledges 31 and the guide block is clamped rigidly to the guide 20. To prevent the bolt from turning around when the nut 29 is tightened or loosened, the upper and lower faces of the rectangular head 27 are flattened, as shown by dotted lines in Fig. 1, constituting restraining edges 32, which are arranged to loosely slide past the upper and lower internal horizontal faces 33 of the T-shaped clamping slot 30.

Detachably secured to the upper part of the block, is the angle-iron wear strip 13 arranged transversely of the shearing machine and preferably consisting of a wear resisting metal of considerable hardness, so as to avoid too frequently replacing of same. Preferably this wear strip is positioned on the clamping block by means of a dowel pin 34, and is bolted thereto by means of bolts 35 arranged on opposite sides of the dowel pin and is restrained against horizontal backward movement by an abutment 36 preferably integral with the guide block and arranged parallel to and adjacent to the rear face of the wear strip.

So that the gage may not obstruct other operations of the shearing machine, such as circle and ring cutting, and also for purposes of replacement, the guide block together with its wear strip may be completely and expeditiously removed by sliding the guide block forwardly until the head of the clamping bolt is disengaged from the guide. Ordinarily, however, it is sufficient to merely slide the gage rearwardly out of the way.

It is apparent that this improved gage is very convenient to use inasmuch as there is but the one adjustment to make when setting the gage, namely turning the nut 29, and yet the gage cannot be thrown out of adjustment when accidentally moved along the guide, because any pressure exerted against the wear strip will act as a lever arm and tend to cock the guide block on one edge which tendency is rendered ineffectual by reason of the considerable length of said guide block. Furthermore, the construction of the gage is such that it is possible to have a very great area of contact between the block and the guide, so that any tendency of the block to slip longitudinally is eliminated after the adjusting nut has been tightened. The wear strip 13 which is the only part of the gage which needs unusual tensile strength and wear resisting qualities, is distinct and separate from the other parts of the gage, so that the same is easily replaceable and also thereby the more expensive metal is only used where necessary. Furthermore, the wear strip would ordinarily be made up of plain angle steel stock rolled to form, thus requiring no elaborate machine work, whereas the necessary manufacturing operations on the other gage parts are facilitated by reason of the fact that said parts may be constructed of cast iron or other similar, easily machined and also less expensive metal. It will be noted furthermore from Fig. 3 that the wear strip is supported vertically by the upper flat face of the lower arm 12 of the main frame, so that the weight of the work piece resting thereon is not transmitted to the guide block and any horizontal movement against said wear string is not only resisted by the shearing strength of the two detachable bolts 35, but also by the abutment 36 on the guide block. Otherwise the gage is so constructed as to stand very considerable strains without distorting the same or changing its adjustment.

I claim as my invention:

1. A shearing machine having a main frame provided with upper and lower arms forming a gap and said lower arm being provided on one of its longitudinal sides with a horizontal T-shaped groove, and a longitudinal guideway on the outer side of said lower arm and on opposite sides of said groove, a carriage slidable horizontally and lengthwise in engagement with that side of the lower arm having the groove and guideway and provided with a longitudinal guide rib engaging with said guideway, a T-bolt passing through said carriage and having its head arranged in the large part of said T-groove and bearing with its nut against the outer side of said carriage, and a gage bar extending transversely over said lower arm and secured at one end to said carriage.

2. A shearing machine having a main frame provided with upper and lower arms forming a gap and said lower arm being provided on one of its longitudinal sides with a horizontal T-shaped groove, and a longitudinal guideway on the outer side of said lower arm and on opposite sides of said groove, a carriage having a vertical longitudinal portion which slides in engagement with the outer side of the lower arm adjacent to the groove and guideway thereof and provided with a longitudinal guide rib engaging with said guideway, a transverse portion projecting laterally outward from the front end of said longitudinal portion and a horizontal portion projecting forwardly from the upper edge of said transverse portion, a T-bolt passing through the vertical longitudinal portion of said carriage and bearing with its nut against the

outer side of the same and having its head arranged in said T-groove, and a gage bar extending across the upper side of said lower arm and secured at one end to said horizontal portion of the bracket.

3. A shearing machine having a main frame provided with upper and lower arms forming a gap and said lower arm being provided on one of its longitudinal sides with a horizontal T-shaped groove, and a longitudinal guideway on the outer side of said lower arm and on opposite sides of said groove, a carriage having a vertical longitudinal portion which slides in engagement with the outer side of the lower arm adjacent to the groove and guideway thereof and provided with a longitudinal guide rib engaging with said guideway, a transverse portion projecting laterally outward from the front end of said longitudinal portion and a horizontal portion projecting forwardly from the upper edge of said transverse portion and having a forwardly facing transverse shoulder, a T-bolt passing through said vertical longitudinal portion of the carriage and bearing with its nut against the outer side of the same and having its nut arranged in said T-groove, and a gage bar of L-shaped section arranged transversely over said lower arm of the frame and engaging with the upper side and shoulder of the horizontal part of said carriage, a dowel extending from said gage bar through said horizontal carriage portion, and belts connecting said bar and horizontal carriage portion.

FREDERICK E. MUNSCHAUER.