No. 897,256. PATENTED AUG. 25, 1908.

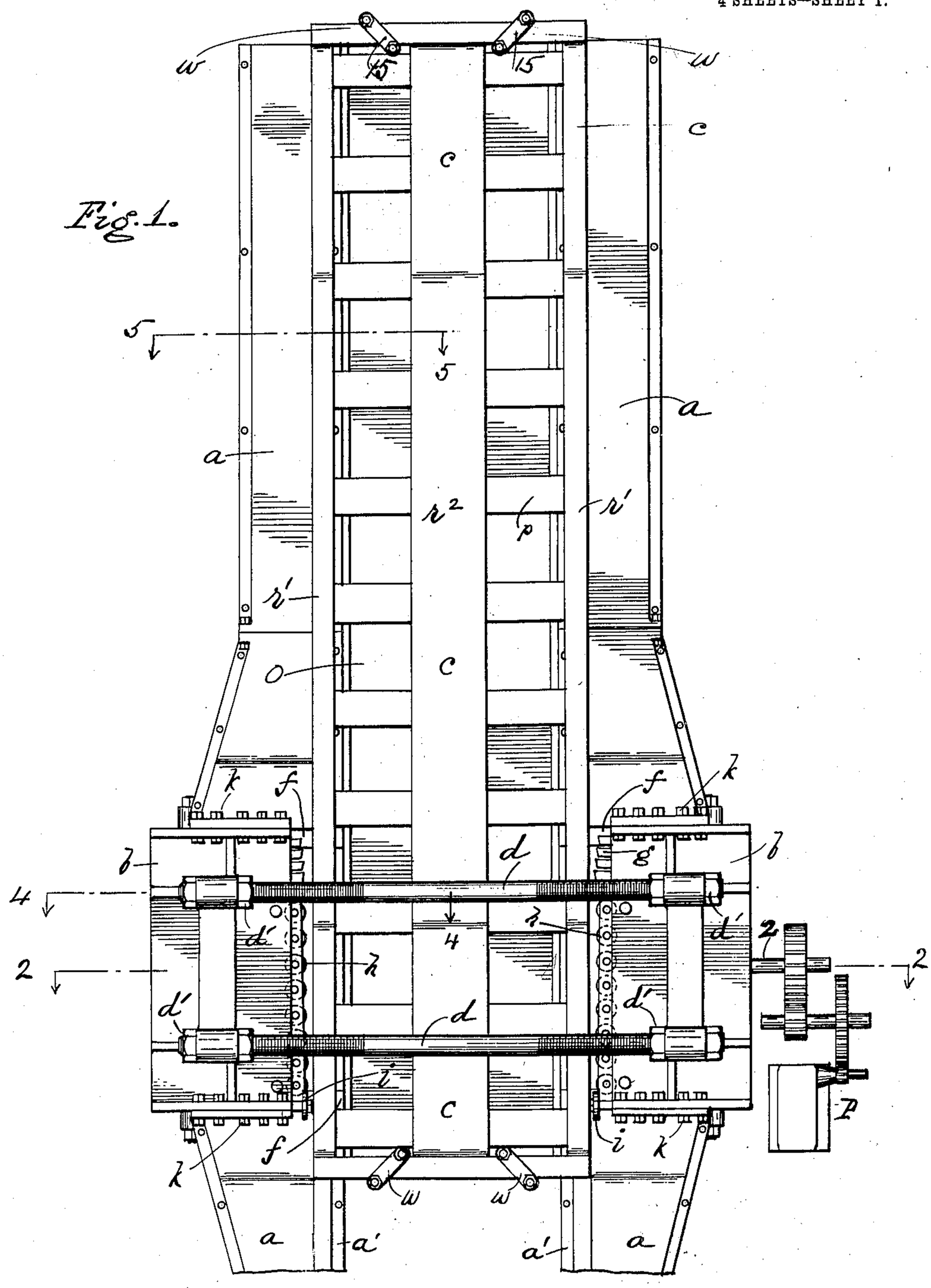
J. FRASER & T. GRAY.

MACHINE FOR EDGING METAL PLATES.

APPLICATION FILED FEB. 25, 1908.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

L. H. Grote

M. E. Keir

INVENTORS

John Fraser

Thomas Gray

BY Howson and Howson

ATTORNEYS

No. 897,256. PATENTED AUG. 25, 1908.

J. FRASER & T. GRAY.

MACHINE FOR EDGING METAL PLATES.

APPLICATION FILED FEB. 25, 1908.

4 SHEETS—SHEET 2.

Fig. 2.

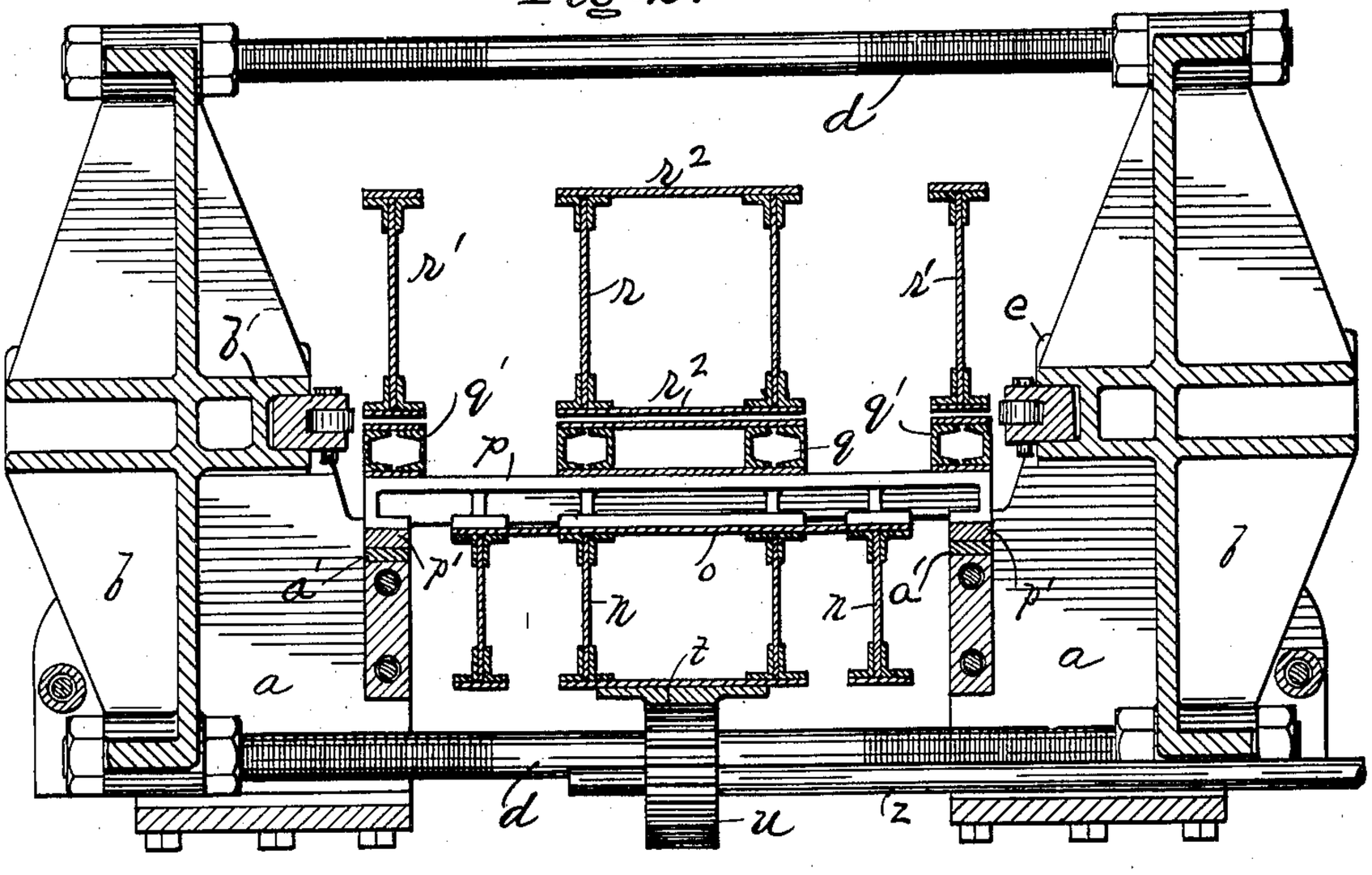
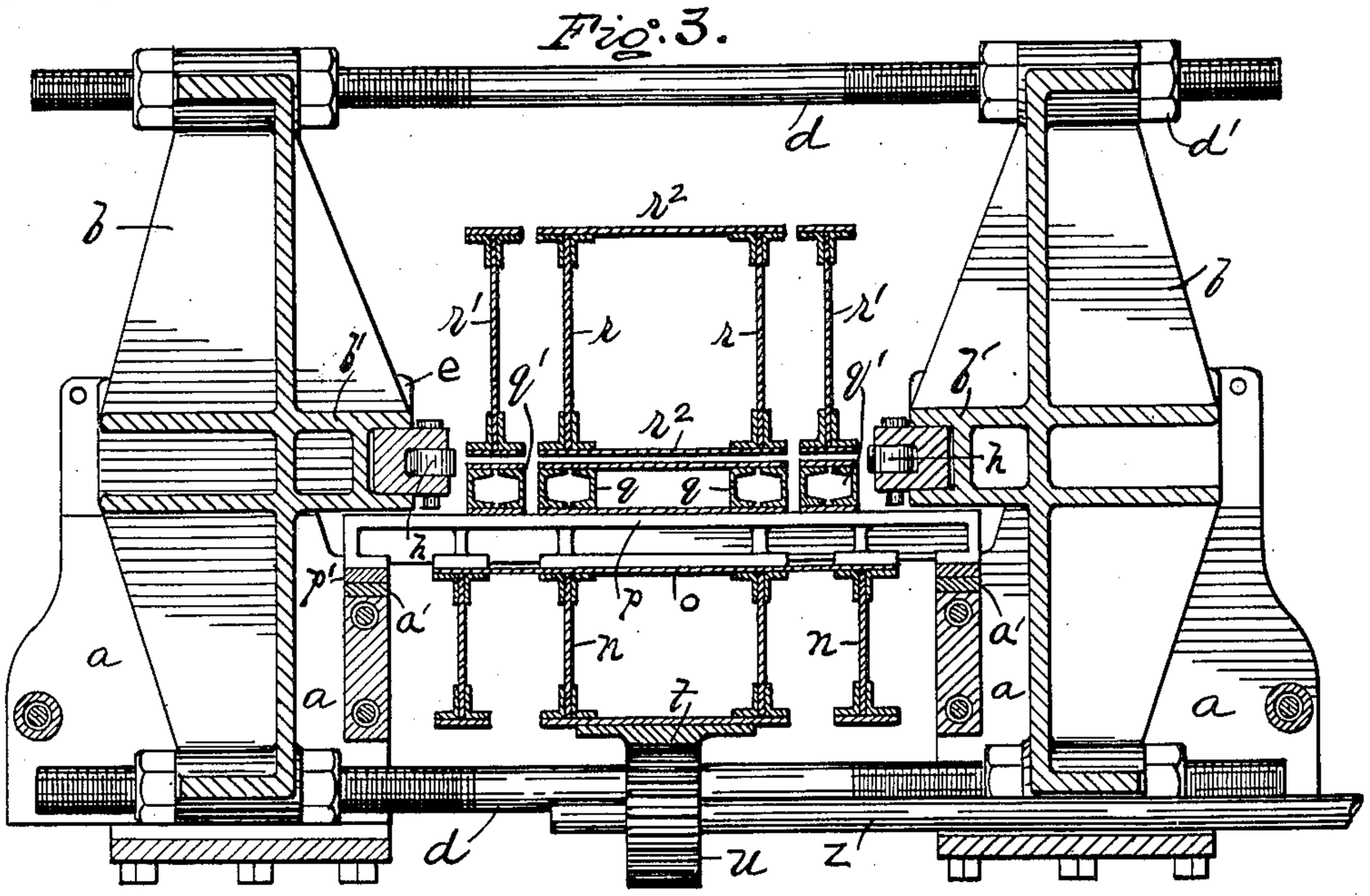


Fig. 3.



WITNESSES:
L. H. Grote
W. E. Keir

INVENTORS
John Fraser
Thomas Gray
BY
Howson and Howson
ATTORNEYS

No. 897,256. PATENTED AUG. 25, 1908.

J. FRASER & T. GRAY.

MACHINE FOR EDGING METAL PLATES.

APPLICATION FILED FEB. 25, 1908.

4 SHEETS—SHEET 3.

Fig. 5.

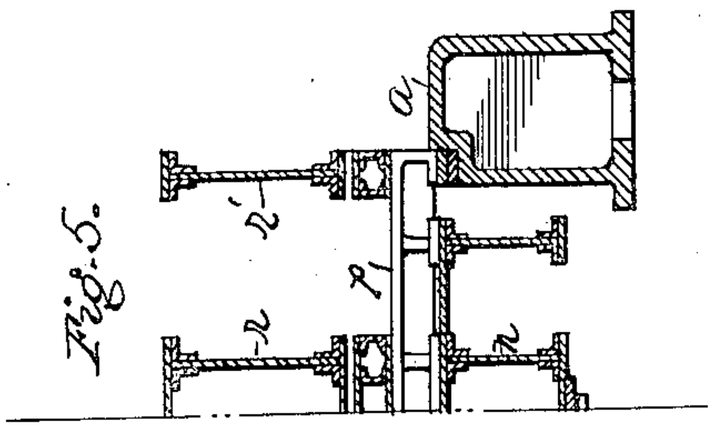


Fig. 4.

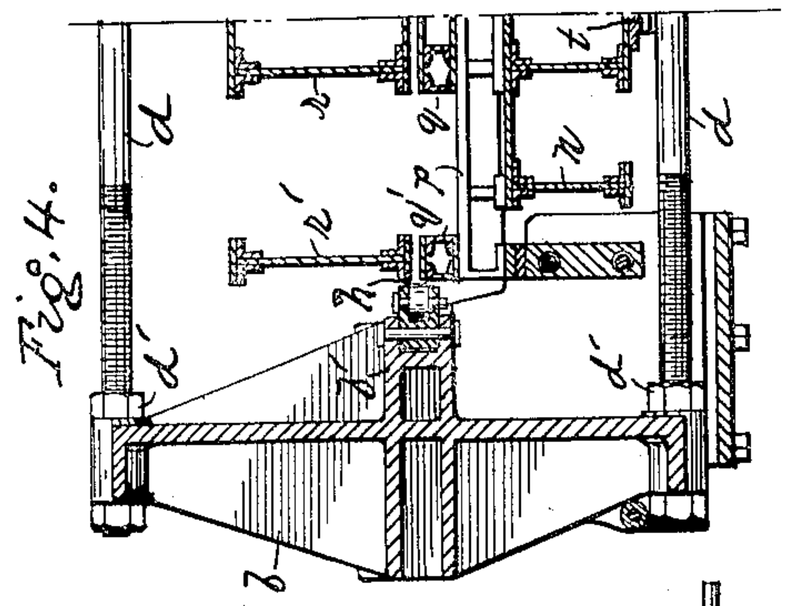


Fig. 6.

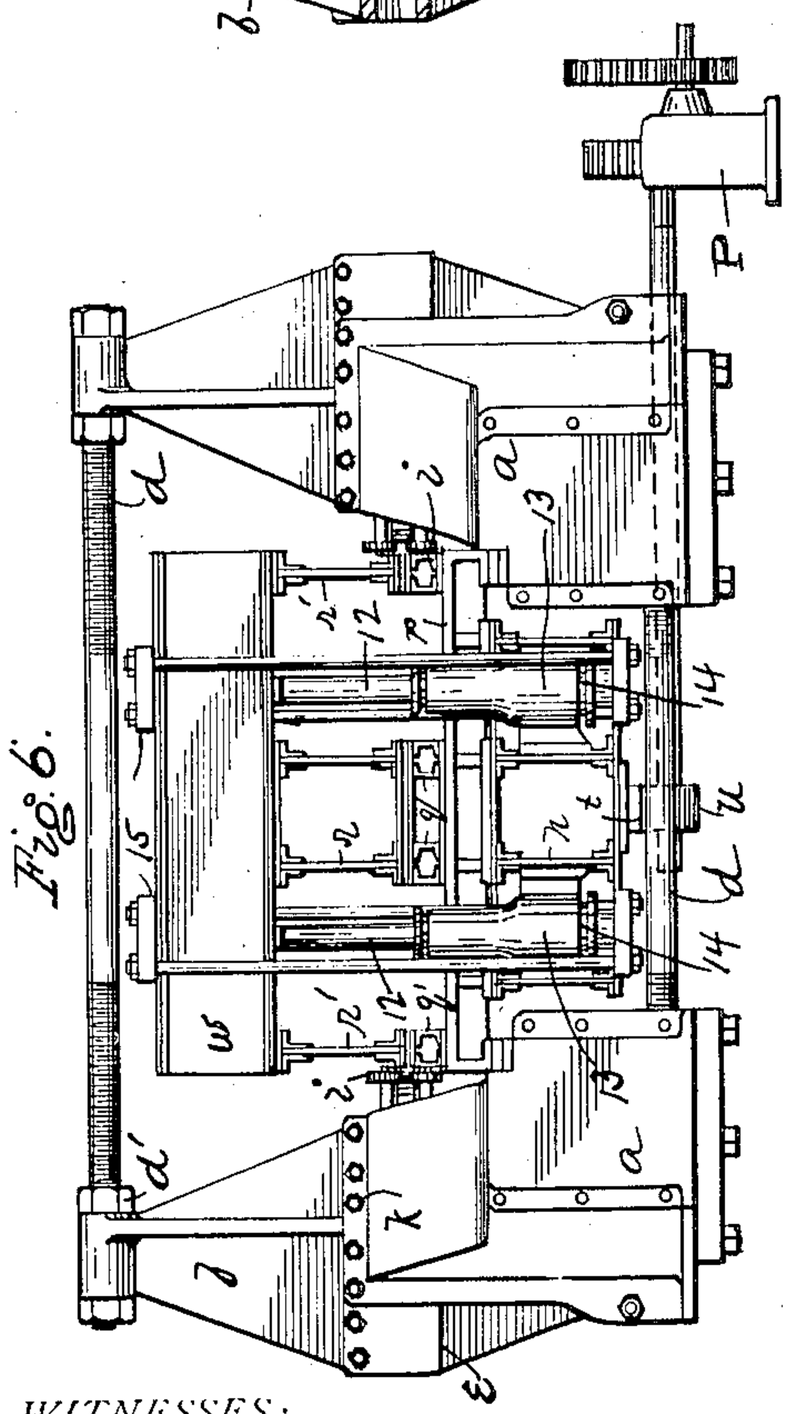
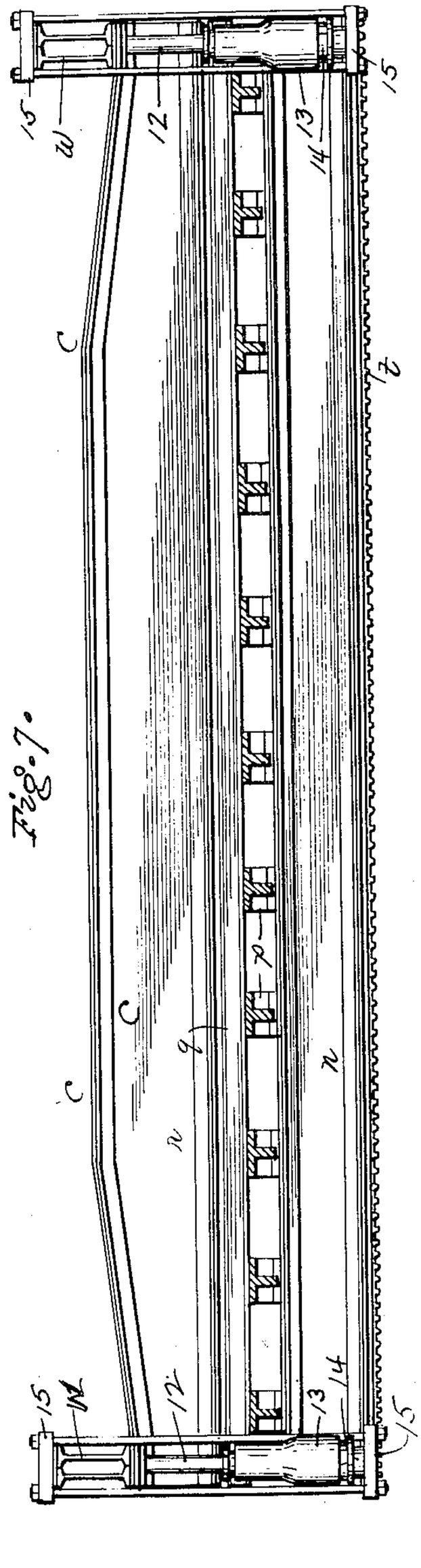


Fig. 7.



WITNESSES:

L. H. Grote

M. E. Keir

INVENTORS

John Fraser

Thomas Gray

BY

Howson and Howson

ATTORNEYS

No. 897,256. PATENTED AUG. 25, 1908.

J. FRASER & T. GRAY.

MACHINE FOR EDGING METAL PLATES.

APPLICATION FILED FEB. 25, 1908.

4 SHEETS—SHEET 4.

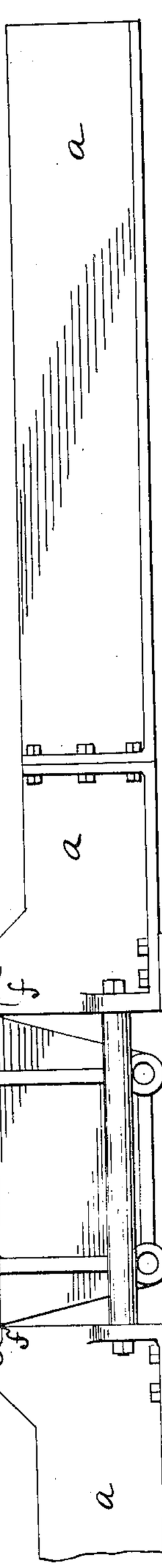


Fig. 8.

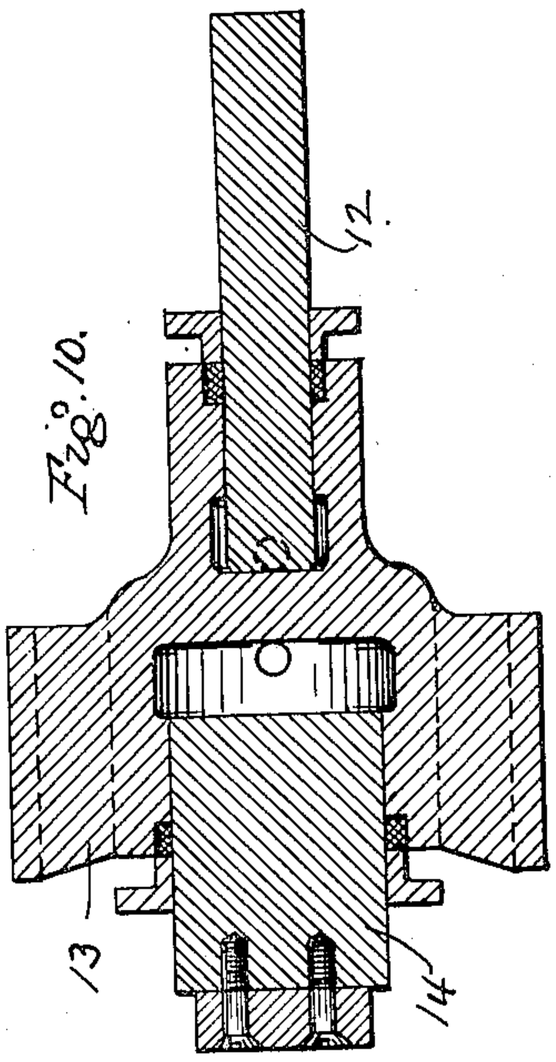


Fig. 10.

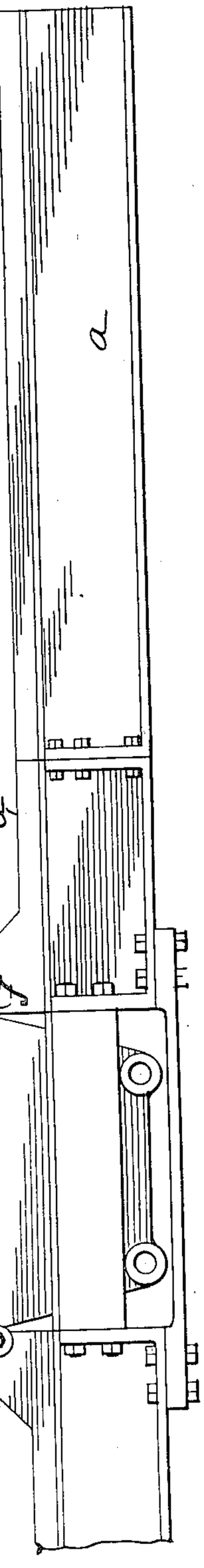


Fig. 9.

WITNESSES:

L. H. Grote

M. E. Lux

INVENTORS

John Fraser

Thomas Gray

BY Howson and Howson

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN FRASER AND THOMAS GRAY, OF PATERSON, NEW JERSEY.

MACHINE FOR EDGING METAL PLATES.

No. 897,256. Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed February 25, 1908. Serial No. 417,720.

To all whom it may concern:

Be it known that we, JOHN FRASER, a citizen of the United States of America, and THOMAS GRAY, a subject of the King of Great Britain and Ireland, both residents of Paterson, in the county of Passaic, in the State of New Jersey, have invented certain new and useful Improvements in Machines for Edging Metal Plates, of which the following is a specification.

This invention relates to a machine more particularly intended for use in the manufacture of metal pipes with rivetless longitudinal joints from metal plates, and the invention consists in an improved construction of machine for the upsetting and planing of the longitudinal edges of the plates by means of which the rivetless joints are produced.

In the accompanying drawings in which is shown a machine embodying our invention, Figure 1 is a plan view of the main part of the machine; Fig. 2 is a cross section on the line 2—2, Fig. 1, but drawn to a larger scale; Fig. 3 is a similar view with the tool holders adjusted to a narrower width of plate; Fig. 4 is a section on the line 4—4, Fig. 1, on the same scale as Fig. 3; Fig. 5 is a cross section on the line 5—5, Fig. 1, drawn to the same scale as Fig. 1; Fig. 6 is an end view of the machine; Fig. 7 is a longitudinal section of the traveling work carriage only; Fig. 8 is an outside elevation of the main part of the bed plate; Fig. 9 is a similar inside elevation of the same; and Fig. 10 is a vertical section of one of the hydraulic cylinders for raising and lowering the work clamps.

In machines heretofore used for the purpose of upsetting and planing the edges of metal plates for the use above mentioned, it has been customary to mount the plate upon a stationary work bed and operate upon the same by means of a traveling tool carriage. It has been found impractical to construct and operate a machine of that character to work on both edges of such plates beyond a very limited width. Moreover, even on plates of moderate width the upsetting machines with traveling tool carriages have involved the use of side bearings and side strain, the use of a very long feed screw shaft specially supported but very liable to get out of order, with excessive and uneven wear on the bearing faces and the production of plates with uneven edges and consequent loss of product.

The work to be done by these machines is very heavy and destructive and one of the first essentials is great strength of the machine. This primary requirement has been secured in our machine and the difficulties above mentioned overcome by the construction which we will now describe.

We provide a stationary bed *a* and tool carriers *b*, and combine therewith a longitudinally traveling work carriage *c*. This construction permits us to materially lighten the weight of the bed *a*, which acts solely as a support for the work carriage and the tool standards, while the whole strain of the upsetting operation is borne by the tie bolts *d* and *d*, which unite the opposite tool-carrying frames *b* both above and below the work carriage. The tool-carrying frames comprise essentially standards provided with slides *e* resting on transverse slideways *f* on the side frames of bed *a* and carrying suitable cutting or planing tools *g* and upsetting rollers *h*, the former to trim the plate to the desired width and the latter to upset the edges of the plate to the desired amount, while "limit" rolls *i* are set to the required thickness of the upset.

The adjustment of the tool holders to the width of the plate is secured by adjusting the nuts d^1 on the threaded ends of the tie rods *d*, which pass through sockets on the frames *b*. After the adjustment has been made the tool holders are secured to the bed plate by bolts *k* passing through suitable holes in the flanges on the two standards and side frames of the bed.

The traveling work carriage is built up of a series of longitudinal girders (four shown) *n*, *n*, and transverse beams *p* with an intermediate plate or plates *o*, all secured together, and to the outer ends of the transverse beams are secured on the underside longitudinal bearing plates p^1 to travel on corresponding longitudinal bearing faces a^1 on the side frames of the bed *a*. To the underside of the two central girders *n*, *n*, is secured a rack *t*, into which gears a pinion *u* on a shaft *z* (Figs. 2 to 6), driven from any suitable source of power P, Fig. 6. Upon the surface of the table are secured longitudinal stringers *q*, q^1, the two outer ones being laterally adjustable, as indicated in Figs. 2 and 3, for different widths of plates to be operated on. The plate to be operated on is laid upon these stringers *q*, q^1 and is clamped thereon by the clamping frame. This clamping frame comprises longitudinal girders *r*, r^1, the two cen-

tral girders r, r, being united by upper or lower plates r^2, (Figs. 2 and 3), while the two outer girders r^1 one laterally adjustable towards or from the central ones, according as the stringers q^1 are adjusted inwardly or outwardly. As best seen in Figs. 5, 6 and 7, the girders r, r^1, are connected together at their ends by cross beams w, w, which in turn are supported on vertical plungers 12 working in hydraulic cylinders 13 secured to the opposite ends of the work table. We prefer to make the cylinders 13 duplex, with plungers at opposite ends, and the two chambers not in communication with each other, as shown in Fig. 10. The lower plungers 14 (Figs. 6 and 7) bear upon yokes or stirrups 15 extending up over the cross beams w, w. We prefer to employ two pairs of plungers at each end of the table. By letting the fluid out of the lower and larger cylinders and into the upper cylinders the plungers 12 will be raised to elevate the clamping frame for the withdrawal of a finished plate and the insertion of a new plate on the table. By letting the fluid out of the upper cylinders and into the lower ones, the clamping frame will be brought down tight onto the plate on the work table to hold it flat while being operated on by the planing tools and upsetting and finishing rolls.

As will be seen on reference to Figs. 2 and 3, a characteristic feature of our machine is that the inner faces of the tool-carrying standards b, b, are cut under immediately below their tool-carrying parts b^1, so that the latter may overhang or project over the edges of the table, when the standards b have to be adjusted towards each other to work on the narrower widths of plates.

It will be seen that owing to the tying together of the tool-carrying standards above and below the work table, no side bearings are required to take up side thrust and give trouble from wear. And only the tool-carrying standard parts need to be made massive and of great strength, the extended ends of the bed being merely required to support the weight of the work and its carriage and being free from other strain.

We do not claim in this case the "overhang" feature of construction of the tool-carrying standards, as that forms a subject of another application for patent filed by us July 22nd, 1908, Serial No. 444,858.

We claim as our invention:

1. A machine for edging plates, having a stationary bed, and a traveling work carriage mounted thereon, in combination with tool-carrying standards on opposite sides of the bed and sets of means separate from the bed for tying together the said standards both below and above the work table.

2. A machine for edging plates, having a stationary bed, and a traveling work carriage mounted thereon, in combination with laterally adjustable tool-carrying standards on opposite sides of the bed and means for tying together the said standards both below and above the work table.

3. A machine for edging plates, having a stationary bed and a traveling work carriage mounted thereon, in combination with standards on opposite sides of the bed-carrying tools to operate on opposite edges of the plate and tie rods connecting the two standards together both below and above the work table.

4. A machine of the character described, having a stationary bed, a movable work carriage mounted thereon, and means for securing the work thereto, in combination with laterally adjustable tool-carrying standards mounted on said bed on opposite sides of said carriage, and carrying a series of tools to operate simultaneously on opposite edges of the work and means for tying together the said standards both below and above the work table.

5. A machine for edging plates, having a stationary bed and a traveling work carriage mounted thereon, in combination with standards carrying tools on opposite sides of the bed to operate on opposite edges of the plate, and tie rods adjustably connecting the two standards together both below and above the work table.

6. A machine for edging metal plates, having a stationary bed and a longitudinally traveling work carriage, in combination with tool-carrying standards, means adjustably connecting the standards together both above and below the work table and means for securing the standards to the bed in the positions to which they are adjusted.

7. A machine for edging metal plates, having a stationary bed and longitudinally traveling work carriage, in combination with tool-carrying standards, tie rods adjustably connecting the standards together both above and below the work table, means for securing the standards to the bed in the positions to which they are adjusted and clamping means for the plate extending substantially the length of the carriage, the parts of said clamping means which are located nearest the standards being also laterally adjustable.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses.

JOHN FRASER.
THOMAS GRAY.

Witnesses:
WILLIAM ABBE,
HUBERT HOWSON.