

No. 655,036.

Patented July 31, 1900.

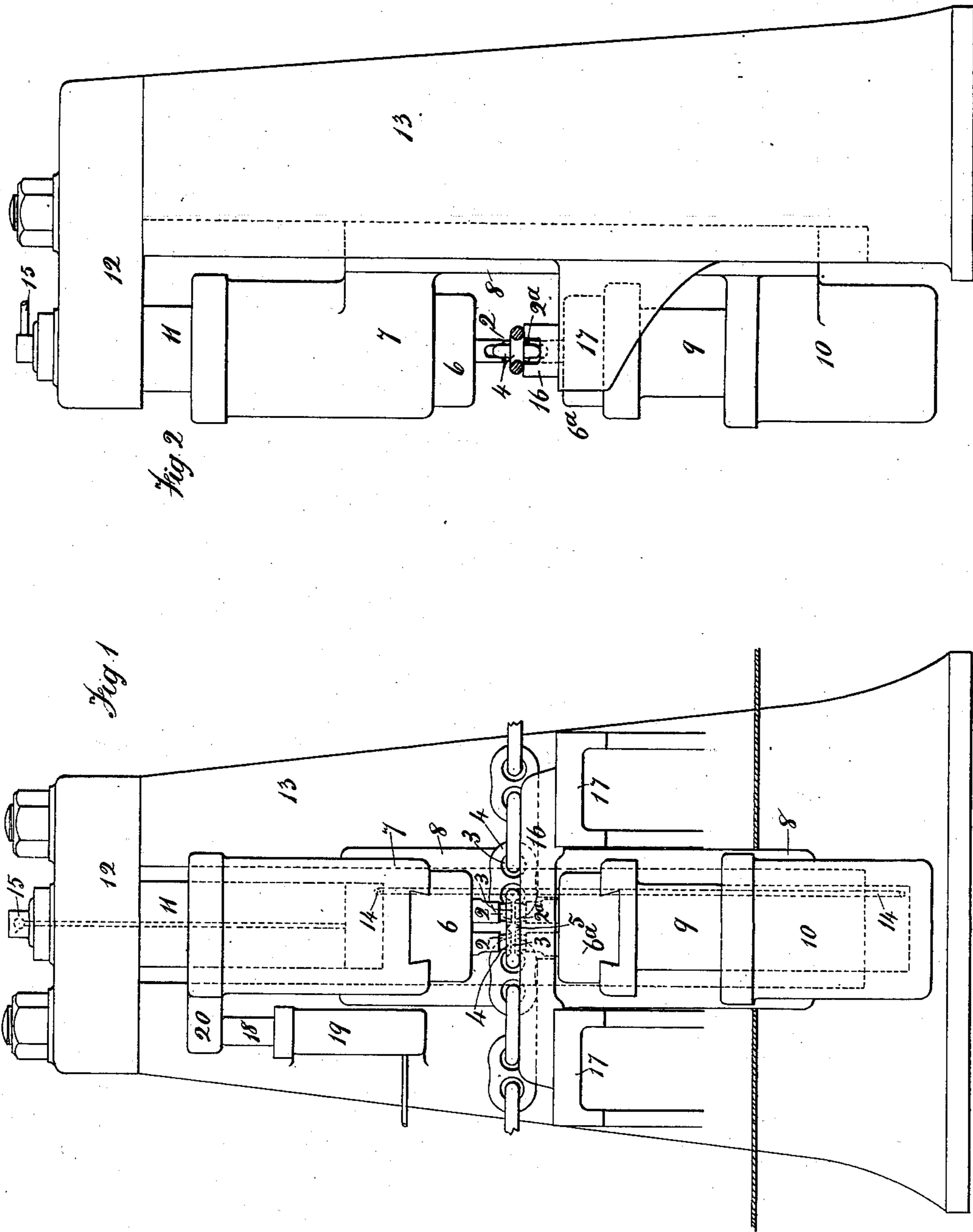
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APPARATUS FOR PUNCHING OR SHEARING CHAINS, &c.

(Application filed Dec. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

Felix Gross
Hetherington Nixon

Inventor

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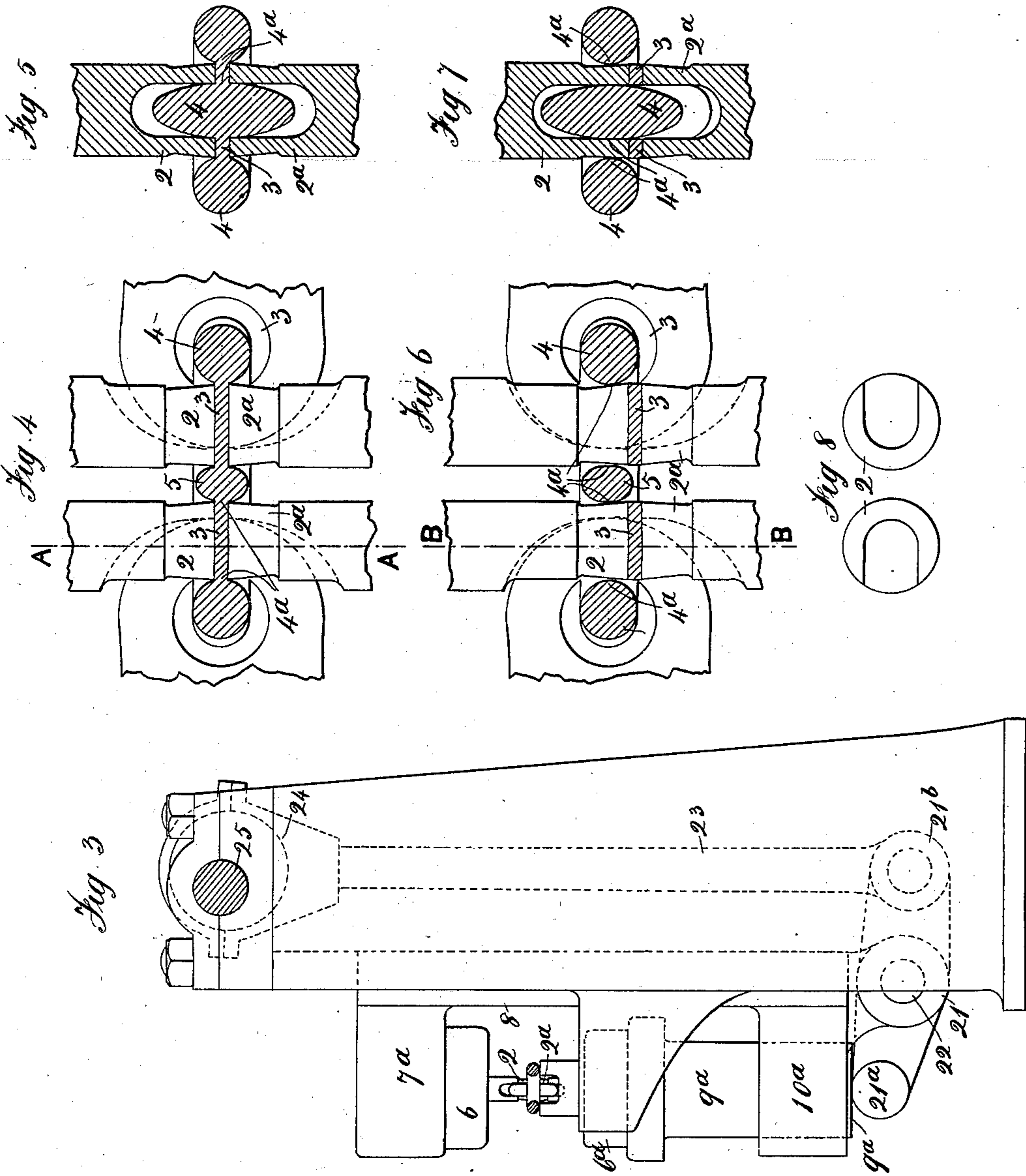
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UNITED STATES PATENT OFFICE.

JOHN WILLIAM WAILES, OF WHITLEY, ENGLAND.

APPARATUS FOR PUNCHING OR SHEARING CHAINS, &c.

SPECIFICATION forming part of Letters Patent No. 655,036, dated July 31, 1900.

Application filed December 20, 1899. Serial No. 740,976. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM WAILES, a subject of the Queen of Great Britain, residing at Whitley, in the county of Northumberland, England, have invented new and useful Improvements in Apparatus for Punching or Shearing Chains or other Articles of Metal, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a front view of a machine for shearing the internal webs from the links of rolled chains to be operated by hydraulic power. Fig. 2 is a side view of the same. Fig. 3 is a side view of a modification to be operated by eccentric or like mechanical means. Fig. 4 is a detail view, on an enlarged scale, of the punches or grippers closed on the webs of a link. Fig. 5 is a view at right angles to Fig. 4 on the line A A. Fig. 6 is a similar view to Fig. 4, showing the webs punched or sheared out of the link. Fig. 7 is a view at right angles to Fig. 6 on the line B B. Fig. 8 is a view of the cutting edges or faces of the punches.

The invention relates more particularly to removing the webs or fins, either internal or external, from the links of rolled weldless chains; but it is also applicable for removing webs of metal from or punching holes in other articles, such as girders, where a thin web has to be removed close to the side of a thicker body of metal.

Hitherto it has been impossible to remove the webs or fins of metal from the links of rolled chains in an economical manner, because dies which would properly support the metal cannot be applied at the point where the metal is to be cut, there being in consequence of the curve on the sides of the links only space for a fine edge which would not stand. Therefore the metal to be cut would be drawn out into a ragged edge instead of being cut clean; also, the cutting edges of the punches are quickly destroyed.

The object of my invention is to provide apparatus whereby webs or fins of metal may be readily and cleanly removed from positions where it is not possible to apply the usual form of dies and at the same time to preserve the cutting edges of the punches.

Referring to Figs. 1, 2, 4, 5, 6, 7, and 8, for

the above purposes I employ punches or nippers 2 2^a on both sides of the webs 3 of the links 4 of a chain. In this case the chain resembles a stud-link chain, and two pairs of punches are used, so as to leave a piece of metal 5 joining the sides of each link. The punches 2 are fitted into a block 6, carried on a cylinder 7, attached to a slide 8. The punches or pressers 2^a are fitted into a block 6^a, carried on a ram 9, working in a cylinder 10, also attached to the slide 8. A ram 11 is carried by the head 12 of the main frame 13, and the cylinder 7 can move up and down around the ram 11, the slide 8 and cylinder 10 moving with it in vertical guides in the frame 13. 14 is a pipe or passage forming a communication between the cylinders 7 and 10. A pipe 15 supplies fluid under pressure to the cylinder 7 and from thence by the passage 14 to the cylinder 10. Bearers 16 support the links while being punched. The bearers 16 allow free passage of the punches and are carried on brackets 17, attached to the framing 13. The action is as follows: Fluid under pressure is admitted through the pipe 15 to the cylinder 7, forcing it and the punches 2 down till they rest on the webs 3 of a link 4. The fluid then passes by the passage 14 to the cylinder 10 and raises the ram 9 and punches or pressers 2^a till they rest against the under side of the webs 3. The edges of the punches are close to the sides or body of the link, and the webs 3 are gripped firmly between the punches at all parts. The pressure of fluid now forces the cylinder 7 still farther down, carrying with it the slide 8, cylinder 10, ram 9, and punches 2 and 2^a and cleanly shearing out the webs 3 from the sides of the link, as shown in Figs. 6 and 7. The gripping of the webs 3 between the punches prevents any dragging of the metal or the leaving of a ragged edge at the point 4^a of the links; also, the edges of the punches 2 are firmly supported by the pressure of the punches 2^a against the web, and such edges are not liable to be blunted or destroyed. The pressure in the cylinder is now released, the punches 2 and 2^a are separated, and the parts are raised into normal position, say, by a small ram 18, working in a cylinder 19, attached to the frame 13, the ram bearing against a projection 20, attached

to the cylinder 7 or slide 8. Any convenient means may be used for restoring the parts to normal position.

5 In open-link chains the two punches 2 would of course be in one and of such shape as to fit close to the sides of the link; also, the punches 2^a would be in one.

10 The fins on the outside of rolled chains may also be readily removed in the above-described manner, the punches being shaped to fit the outside of the links.

Referring to Fig. 3, in this arrangement the action of the punches 2 2^a is the same as under Figs. 1 and 2, but they are operated
15 by mechanical means instead of hydraulic power. The punches 2 in the block 6 are carried in a head 7^a, attached to the slide 8. The punches 2^a and block 6^a are carried on a slide 9^a, movable in a guide 10^a, secured to
20 the slide 8. A lever 21 is pivoted to the slide 8 at 22. One end 21^a of the lever bears against the slide 9^a, and the other end 21^b is connected by a rod 23 to an eccentric 24 on a shaft 25. As the eccentric rotates the slide
25 8 descends until the punches 2 rest on the webs of the link. The lever 21 then raises the slide 9^a and punches 2^a. Further rotation of the eccentric forces the lever 21, slide 8, and punches down and shears out the webs, as
30 before described. Continued rotation of the eccentric restores the parts to normal position again.

I do not confine myself to the particular arrangements of parts for operating the
35 punches above set forth, as it will be obvious that other arrangements may be devised according to circumstances. For instance, two separate hydraulic rams might be used to operate the punches, one ram being of superior
40 power to the other.

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

1. In shearing or punching apparatus, the combination of punches arranged to press on each side of a web of metal, and mechanism 45 for moving one punch toward the other, the latter punch being mounted on a movable abutment; substantially as described.

2. In punching or shearing apparatus, the combination of punches arranged to press on 50 each side of a web of metal, mechanism for moving one punch relatively to the other, and mechanism for moving both punches simultaneously transverse to the metal; substantially as described. 55

3. In apparatus for shearing or punching thin webs or sections of metal from thicker sections of metal the combination of a punch carried at one end of a slide a second punch movably supported at the other end of the 60 slide, means for moving the second punch relatively to the first punch and means for moving both punches and the slide in a direction transversely to the thicker section of metal substantially as described. 65

4. In apparatus for shearing or punching thin webs of metal from thick sections of metal the combination of a punch carried on a slide, a presser carried on the same slide, means for operating the punch, and means 70 for holding the presser against the thin web of metal while being sheared substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 75 two subscribing witnesses.

JOHN WILLIAM WAILES.

Witnesses:

FELIX GROSS,
HETHERINGTON NIXON.