

No. 704,941.

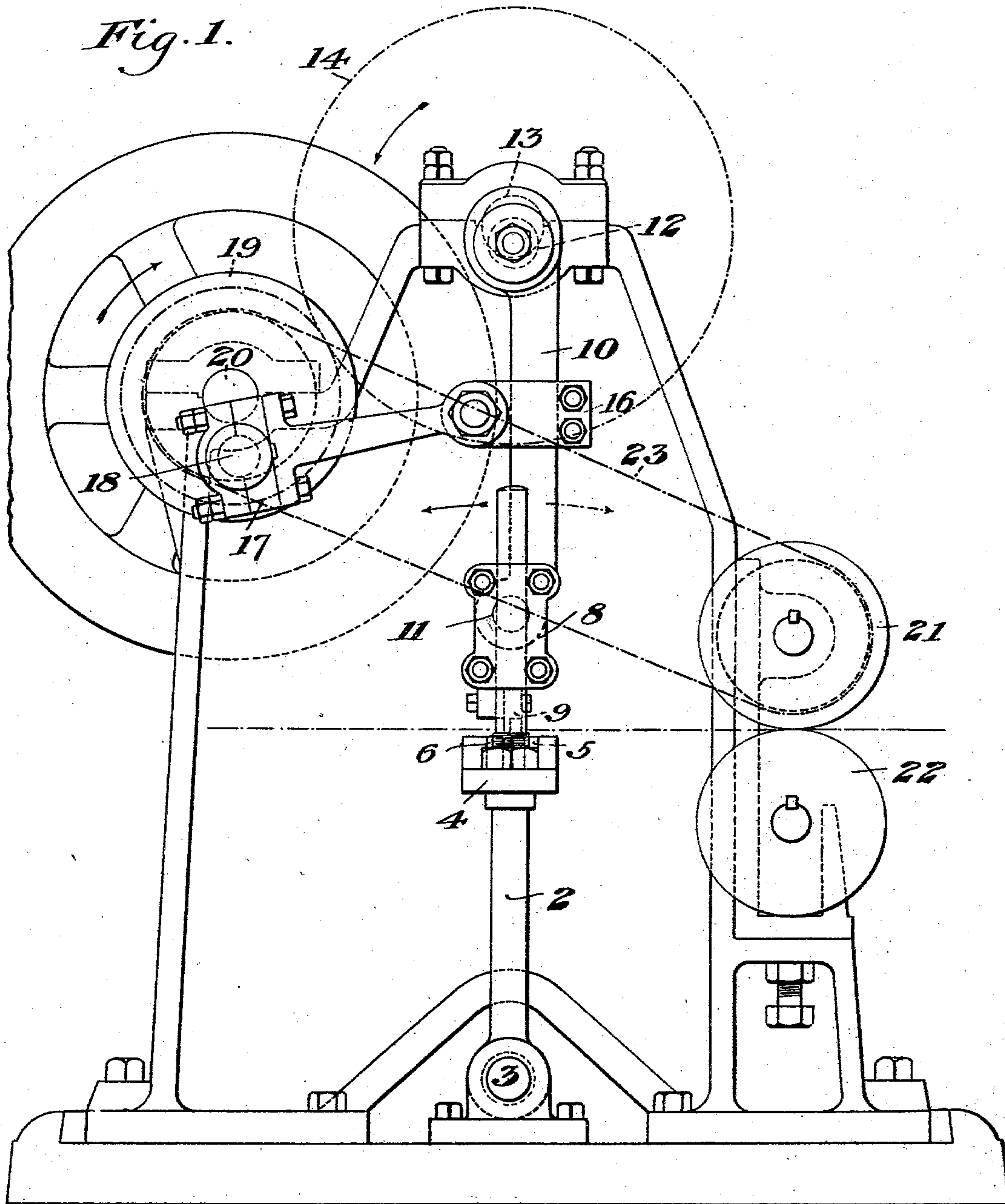
Patented July 15, 1902.

E. E. SLICK.
TRAVELING CUTTER MECHANISM.

(Application filed Feb. 1, 1902.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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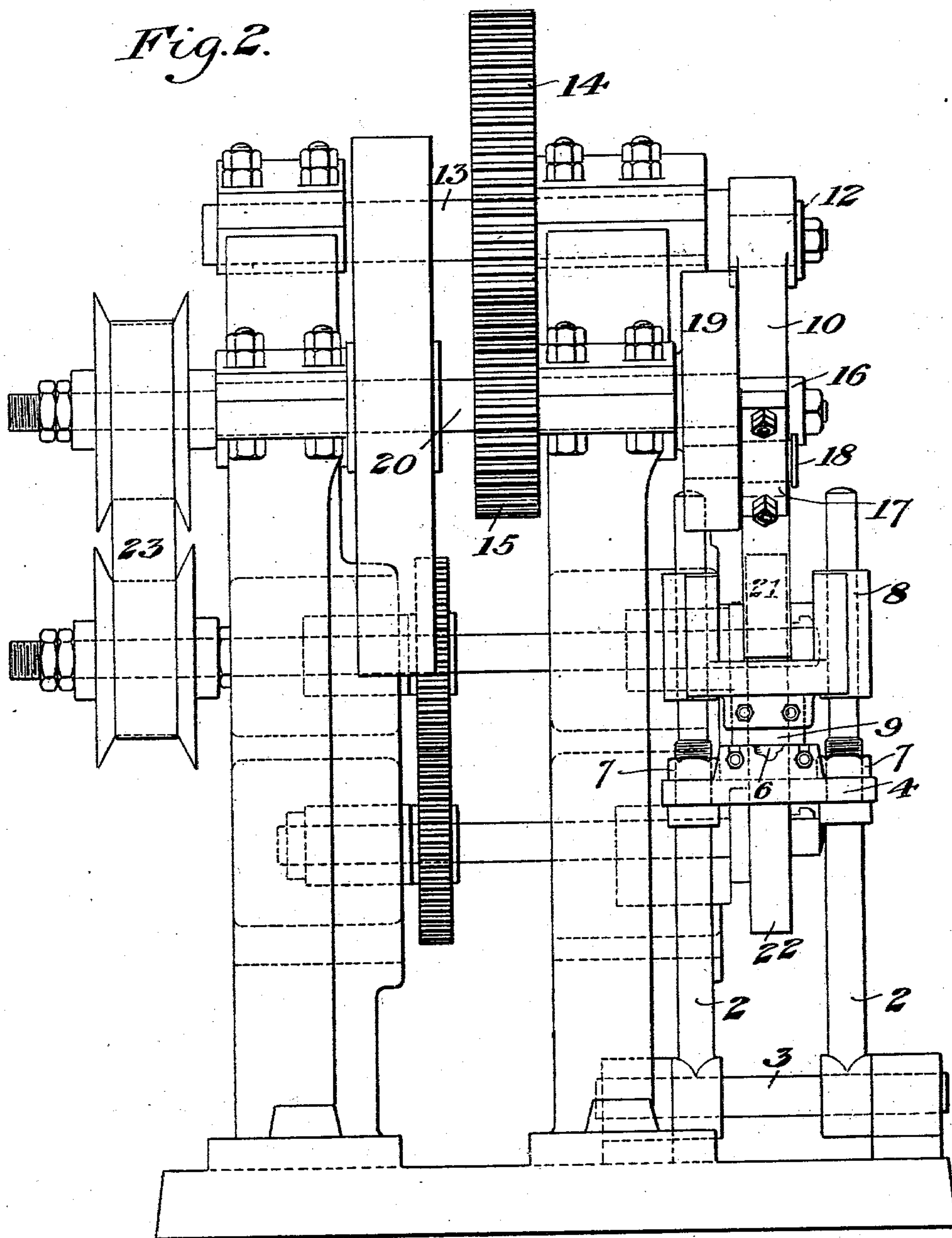
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3 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

EDWIN E. SLICK, OF PITTSBURG, PENNSYLVANIA.

TRAVELING CUTTER MECHANISM.

SPECIFICATION forming part of Letters Patent No. 704,941, dated July 15, 1902.

Application filed February 1, 1902. Serial No. 92,162. (No model.)

To all whom it may concern:

Be it known that I, EDWIN E. SLICK, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Traveling Cutter Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation showing my improved apparatus at the instant of cutting. Fig. 2 is an end elevation of the same. Fig. 3 is a sectional side elevation of the moving parts in position after the cut has been made. Fig. 4 is a top plan view of the lower die, and Fig. 5 is an enlarged face view of the upper die.

My invention relates to the cutting or punching of traveling strips or bars during their movement, and it is especially designed to punch a traveling hoop-iron strip as it is fed continuously forward by the rolls, though the mechanism may be also employed for merely shearing or severing the traveling strip into lengths.

Heretofore in punching hoop-iron strips to form a square portion at one end and a round portion at the other end the strip has been fed forward intermittently or step by step, and this operation has been a slow and expensive one. My invention overcomes this difficulty and provides a simple and effective punch mechanism which will cut out a section of the desired shape from a traveling strip.

In the drawings, 2 2 represent upwardly-projecting arms secured to a rock-shaft 3 and having secured at an intermediate point in their length a cross-head 4. This cross-head is provided with a central opening which is formed of the desired shape by means of a curved die 5, removably secured at one side, and a straight die 6, similarly secured at the opposite side. This fixed cross-head may be adjusted along the rock-arms by nuts 7.

A sliding cross-head 8 fits loosely around and is guided upon the upper portions of the rock-arms 2, such sliding cross-head carrying the upper cutting-die 9, which is arranged to enter the space between the two lower dies and cut a piece of the desired shape out of the traveling hoop-strip. This traveling

cross-head is supported upon an eccentric-link 10, pivoted to an intermediate cross-shaft 11 of the cross-head. The eccentric-link is provided with an eccentric-strap surrounding an eccentric 12 upon a shaft 13, having a large toothed wheel 14, intermeshing with a pinion 15 on the driving-shaft. I have shown the shafts as geared together in the ratio of two to one; but they may be arranged in other ratios, thus making the punch operative at any desired number of complete strokes of the cross-head swinging on arms 2 and rock-shaft 3.

A yoke 16 is clamped to the intermediate part of the eccentric-link and is pivotally connected with a connecting-rod 17, mounted on crank 18, which is secured to crank-disk 19, mounted on the driving-shaft 20.

The feed-rolls 21 and 22 for the strip are located as shown in Figs. 1 and 3, and one of them is connected by pulley and belt 23 with a driving-pulley on the shaft 20.

In the operation of my improved apparatus the driving-shaft being continuously rotated the eccentric-shaft, as shown, will revolve once to each two revolutions of the driving-shaft, the driving-shaft moving clockwise while the eccentric-shaft moves counter-clockwise. At each second revolution therefore of the driving-shaft in the form shown the hoop-bar will be punched by the action of the dies, which momentarily assume the position of Fig. 1. The lower die-carrier is swung by the upper cross-head, which is pivoted to the eccentric-rod, and this eccentric-rod is oscillated by its connecting-rod, while at each second revolution of the driving-shaft the eccentric will force the upper die between the lower dies and punch the traveling strip. The driving-shaft rotates at a constant speed. The speed of the feed-rolls controls the length of the piece cut, and such speed of the rolls is varied by means of the adjustable cone-pulleys, which may be drawn together to change the belt 23 to a different point, this being a common form of changeable-speed gear. To make the cross-head move at the same speed as the piece when the speed is thus changed, the yoke 16 is adjusted along the link 10 in either direction. The punching is effected by the motion given to the

cross-head 8, carrying the die 9, such motion being given by eccentric 12. The link 10 transmits the motion of the crank to the oscillating arms and rock-shaft and also transmits the motion of the eccentric 12 to the sliding cross-head. The reciprocal motion of the dies, combined with their travel at the same speed as that of the strip at the instant of cutting, gives a clean desirable cut.

The advantages of my invention result from the punching of a continuously-moving strip. The use of a counter-shaft rotating at a lower rate of speed than the driving-shaft enables me to actuate the dies to cut the traveling bar in lengths greater than the peripheral length of the path of the driving-crank, thus doing away with the necessity for a large driving-wheel. The parts are simple and few in number, and the movements are positive. The system would be of value in shearing mechanism.

Many variations may be made in the form and arrangement of the cutting-dies, the die-carriers, and other parts without departing from my invention.

I claim—

1. In apparatus for cutting traveling strips, a pair of cutters, movable supports therefor, crank mechanism arranged to impart a back-and-forth movement to both of said cutter-supports, and mechanical connections arranged to reciprocate at least one of the cutters, substantially as described.

2. In apparatus for cutting traveling strips, a pair of cutters, mechanism for oscillating both of said cutters at the same rate of speed as the strip, and separate power-actuated connections for reciprocating at least one of the cutters during this movement; substantially as described.

3. In apparatus for cutting traveling strips, a pair of cutters, supporting mechanism for imparting a back-and-forth movement to the cutters, and mechanism for reciprocating at least one of the cutters at intervals of more

than one double stroke; substantially as described.

4. In traveling cutter mechanism, a fixed cutter mounted on an oscillatory carrier, connections arranged to oscillate said carrier, a traveling cutter secured to a carrier loosely guided on the oscillatory carrier, a swinging arm pivoted to the traveling cutter-carrier, mechanism for swinging the said arm, and mechanism for reciprocating the movable cutter during the oscillatory movement; substantially as described.

5. In traveling cutter mechanism, a die having a cutting-aperture, a cutter-die arranged to enter the aperture, mechanism for oscillating both of said dies at the speed of the traveling strip, and mechanism for simultaneously reciprocating at least one of said dies; substantially as described.

6. In traveling punch mechanism, a die mounted on an oscillatory carrier, a cross-head sliding on said carrier and having a movable die, an eccentric-rod pivoted to the cross-head, and mechanism for oscillating the eccentric-rod and actuating the eccentric; substantially as described.

7. In traveling cutter mechanism, a pair of cutters, mechanism for oscillating said cutters, and mechanism for reciprocating one of the cutters, the said reciprocating mechanism operating at intervals greater than each double oscillation; substantially as described.

8. In cutter mechanism, a pair of traveling cutters, mechanism arranged to impart a back-and-forth movement to both of said cutters at the speed of the traveling strip, and mechanism arranged to reciprocate one of the cutters; substantially as described.

In testimony whereof I have hereunto set my hand.

EDWIN E. SLICK.

Witnesses:

GEO. B. BLEMING,
H. M. CORWIN.