(No Model.) 4 Sheets—Sheet 1.

A. C. RYAN.

METAL SHEARING AND PILING MECHANISM.

No. 547,293. Patented Oct. 1, 1895.

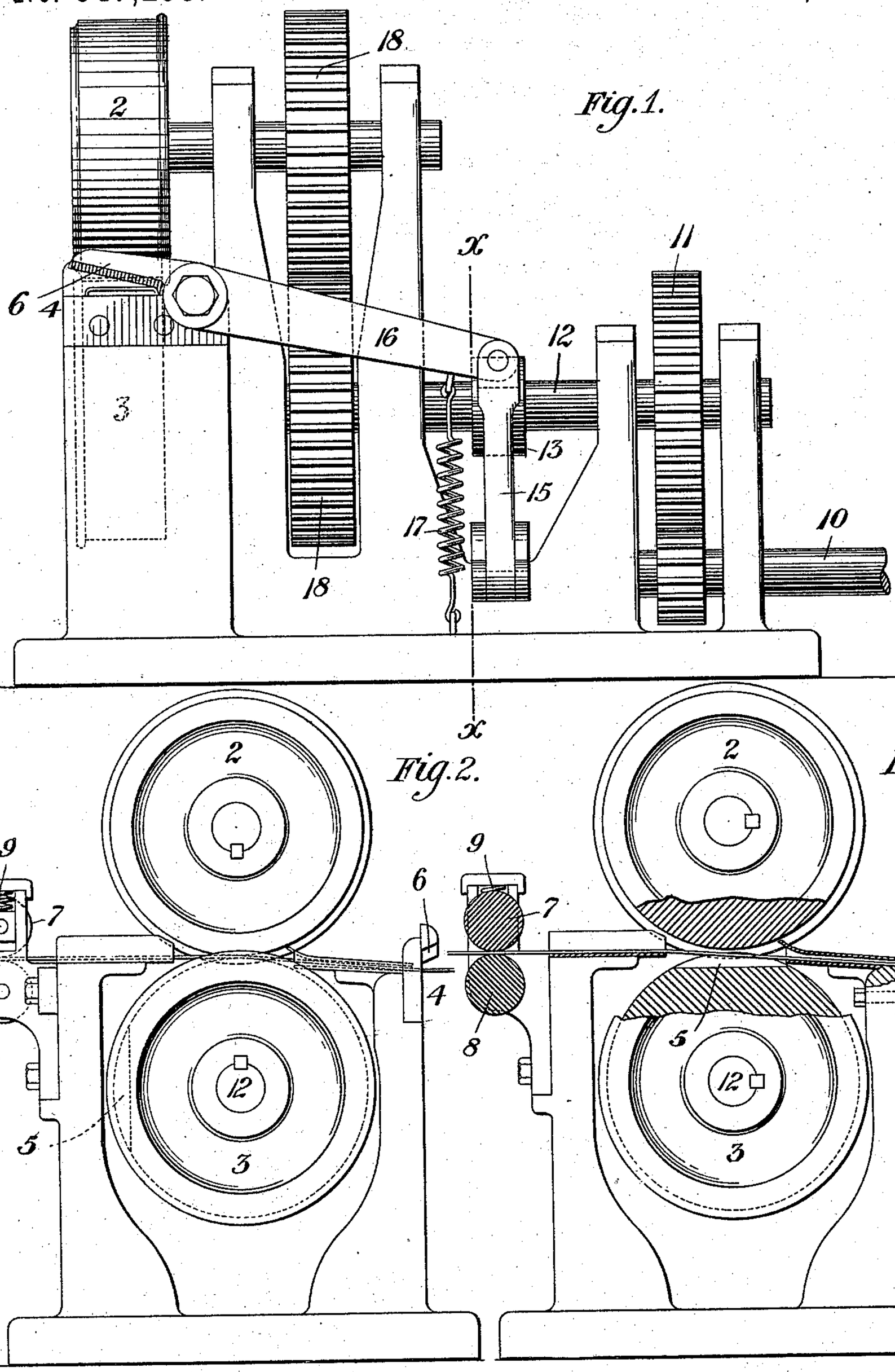

Fig. 1.

Fig. 2.

Fig. 3

WITNESSES

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(No Model.)

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Fig. 4.

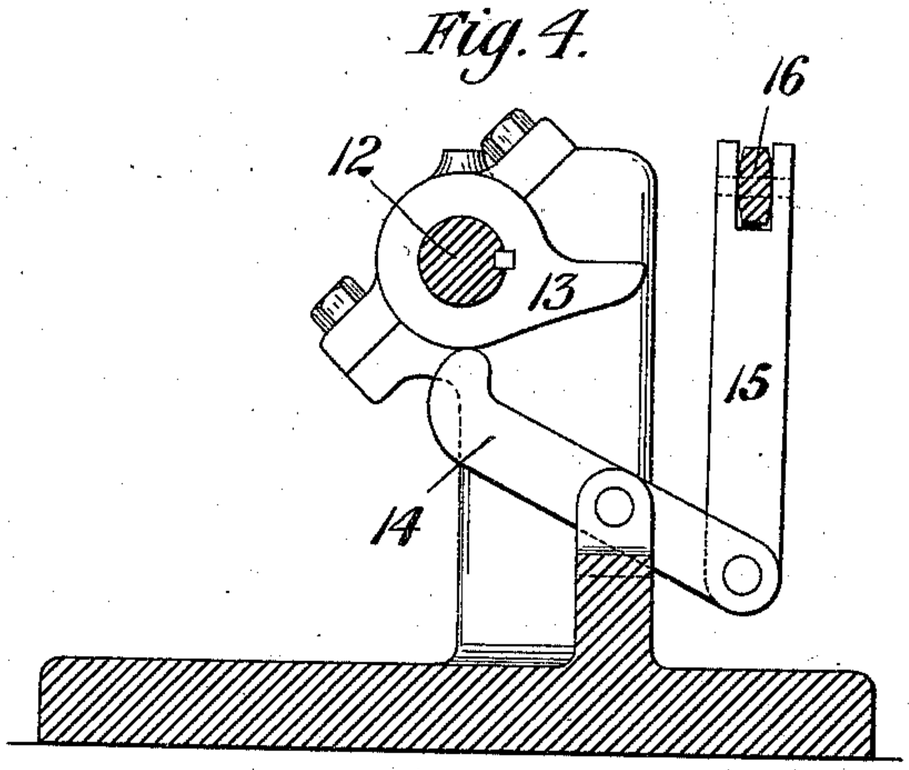


Fig. 5.

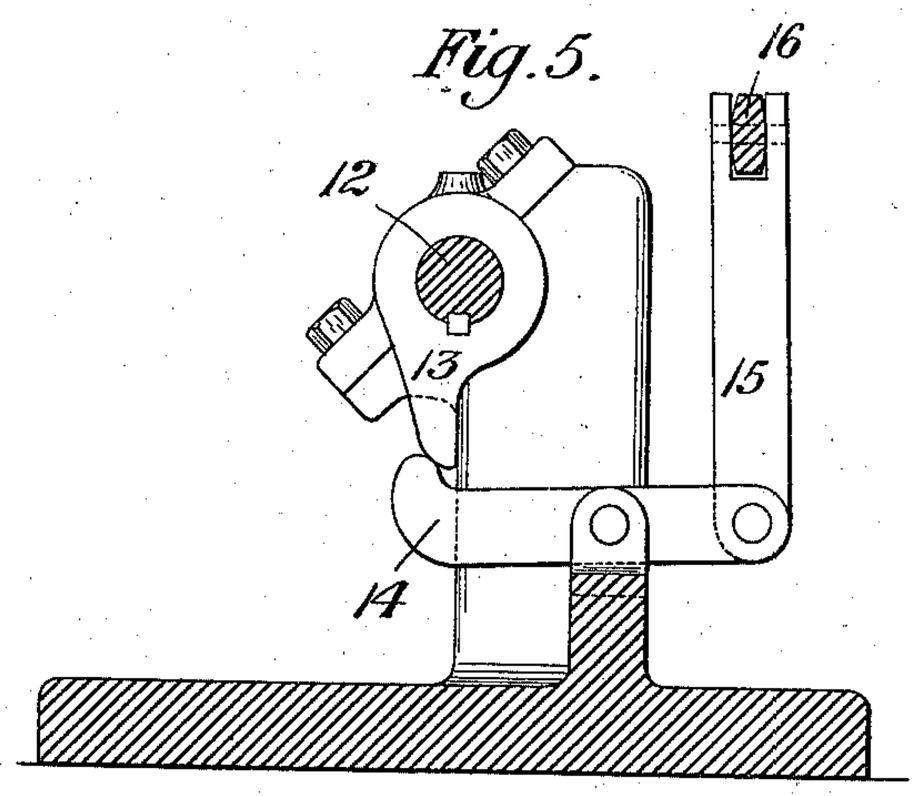
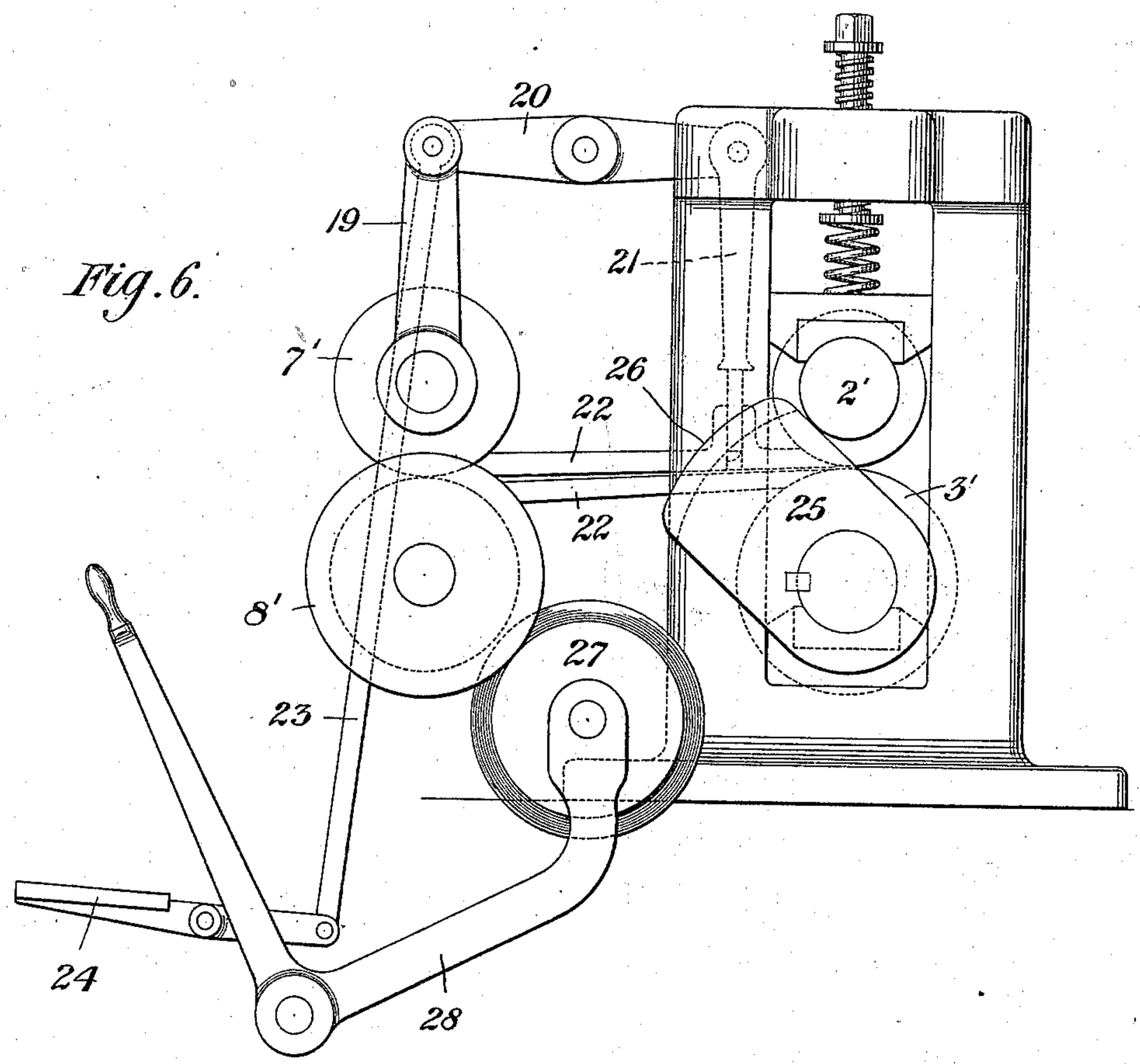


Fig. 6.



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(No Model.) 4 Sheets—Sheet 3.

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METAL SHEARING AND PILING MECHANISM.

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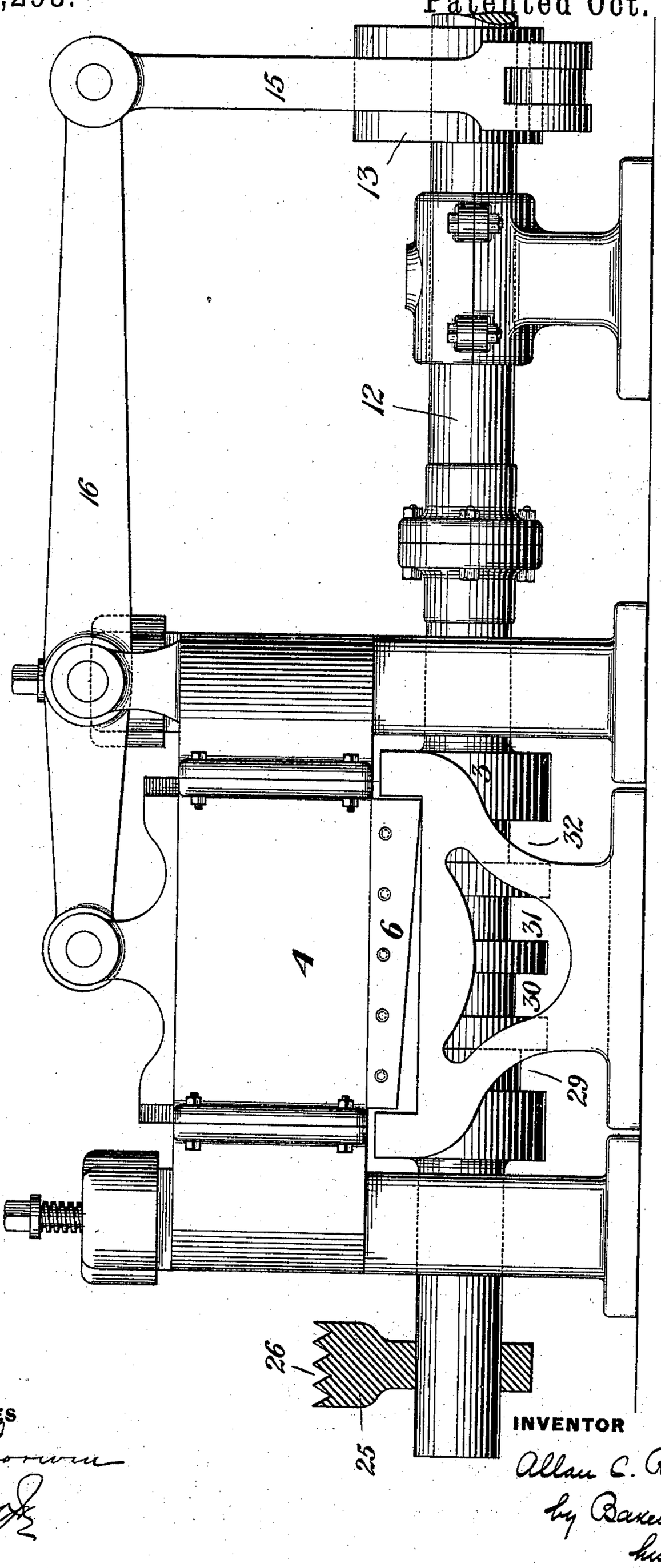

Fig. 7.

WITNESSES

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(No Model.) 4 Sheets—Sheet 4.

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METAL SHEARING AND PILING MECHANISM.

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Fig. 9.

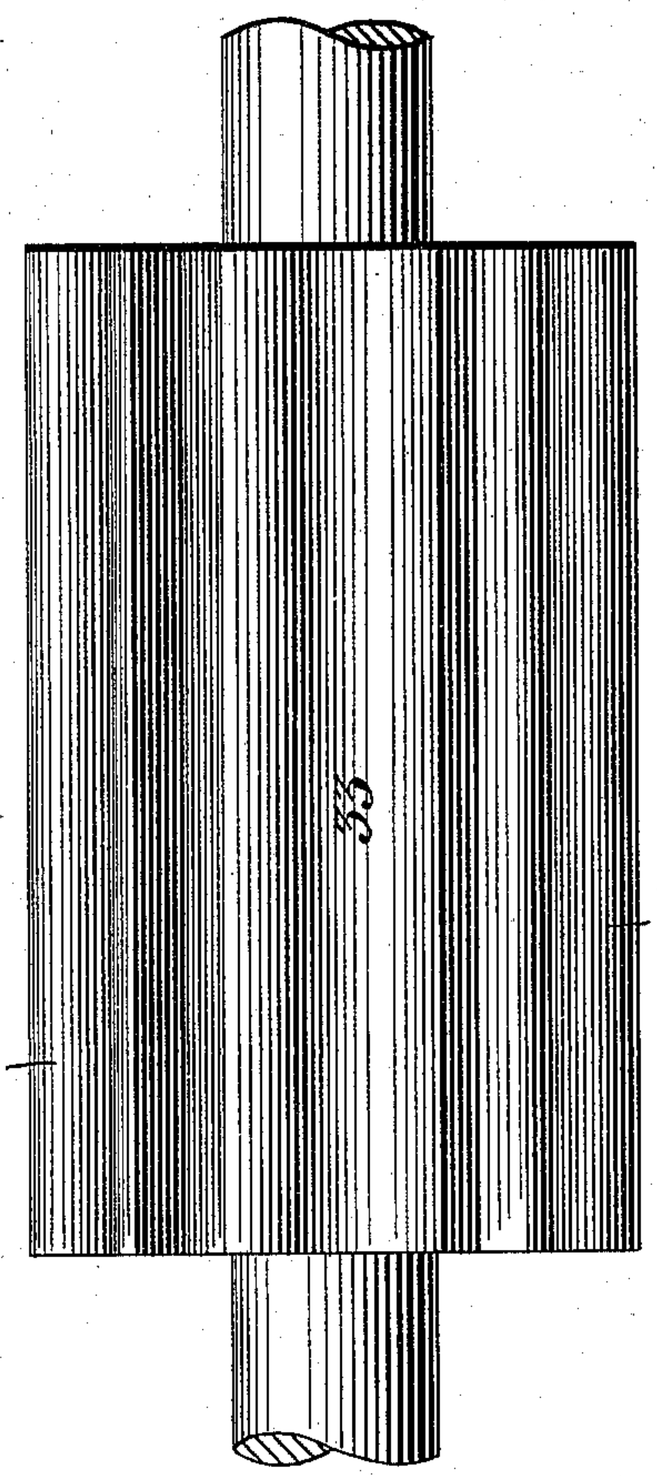


Fig. 11.

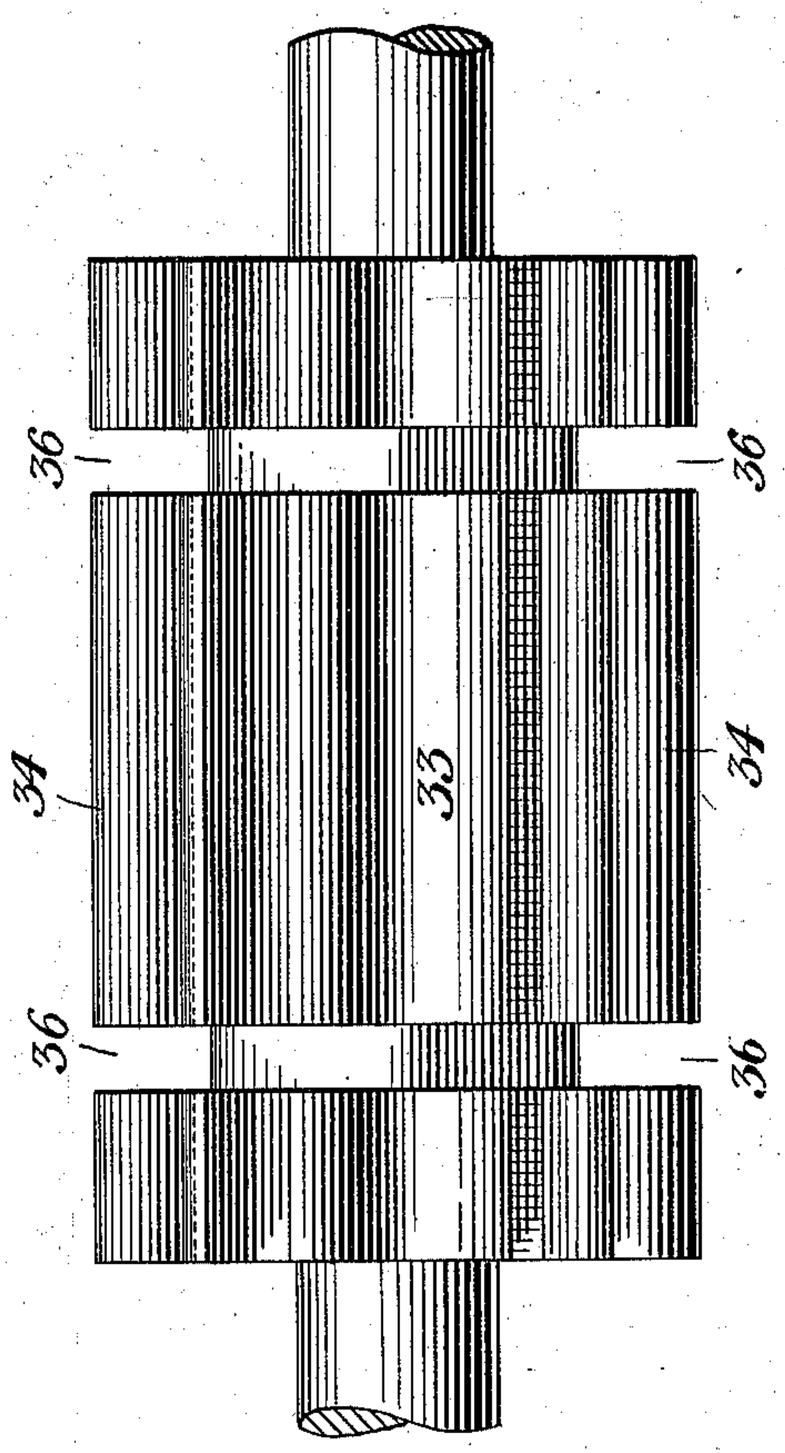


Fig. 8.

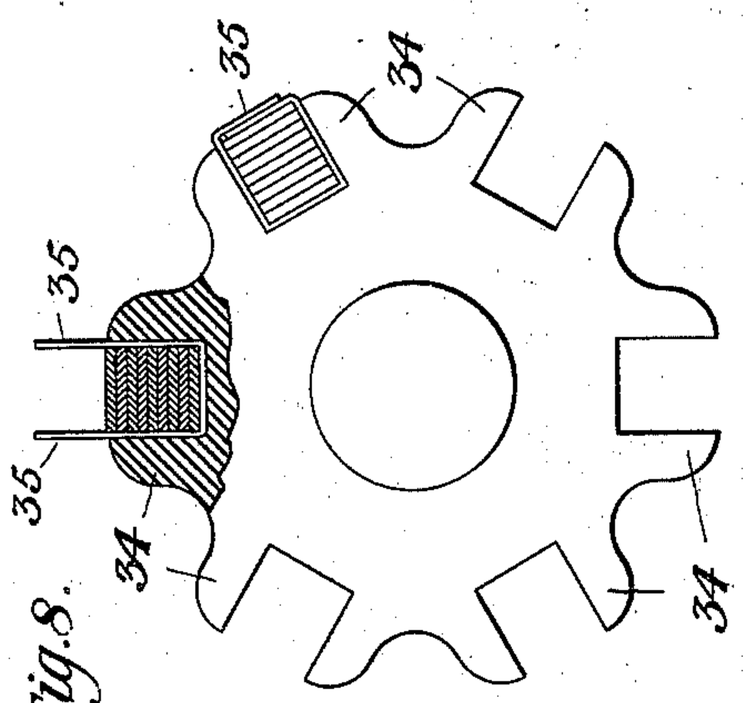
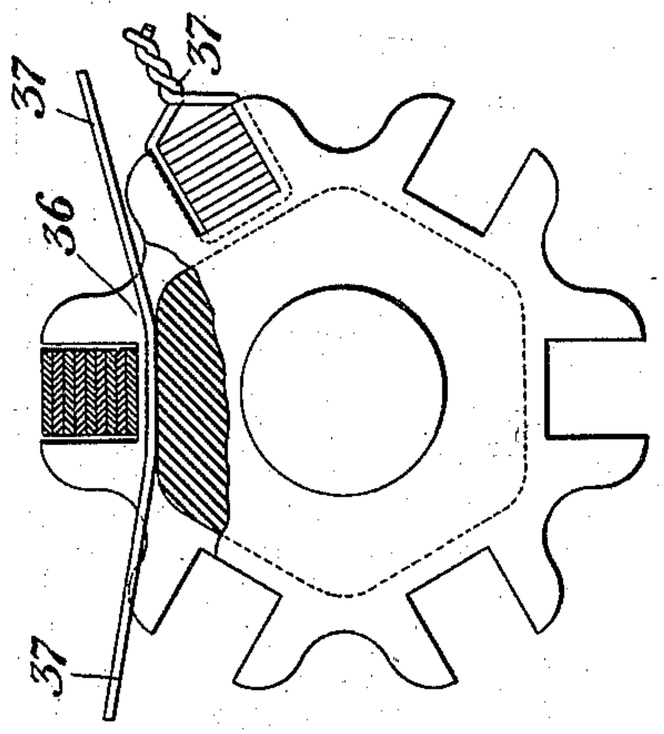


Fig. 10.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALLAN C. RYAN, OF NEWBURG, OHIO.

METAL SHEARING AND PILING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 547,293, dated October 1, 1895.

Application filed May 31, 1895. Serial No. 551,083. (No model.)

To all whom it may concern:

Be it known that I, ALLAN C. RYAN, of Newburg, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Metal Shearing and Piling Mechanisms, 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 front elevation showing a simple form of my improved cutter or shears. Figs. 2 and 3 are side elevations of the same in different positions, Fig. 3 being broken away to show the parts more clearly. Figs. 4 and 5 are cross-sections on the line *x x* of Fig. 1, with the cam in different positions. Fig. 6 is a side elevation of my preferred form of feeding device, showing means for entering the strip of metal at the proper time. Fig. 7 is a front elevation showing the form of feeding-rolls which I prefer to employ therewith. Fig. 8 is an end elevation, partly broken away, of the piling apparatus. Fig. 9 is a side elevation of the same. Fig. 10 is an end elevation, partly broken away, of another form of piler; and Fig. 11 is an end elevation of the same.

My invention relates to the cutting and piling of metal bars and shapes, such as hoops or other sections, and is designed to afford a simple and effective apparatus which will automatically divide a bar into sections of a uniform length and will pile them up ready for bundling.

To that end it consists, first, in the combination, with a shears, of two feeding-rolls, one or both of which is flattened or reduced in diameter at one portion of its circumference, so arranged that the feeding of the metal will cease at the moment that the shear acts; second, in means for starting the bar into the rolls at such a moment that at the first cut of the shear a section of the desired length will be severed, thus doing away with one scrap end; third, in feeding-rolls having interfitting rings and grooves of different depths, so that different lengths of bar-sections may be cut, as desired, and, fourth, in an improved piler to receive the severed sections.

It also consists in the construction and arrangement of the parts, as hereinafter more fully described, and set forth in the claims.

In the drawings, in which similar numerals indicate corresponding parts, (referring to Figs. 1 to 5, inclusive,) 2 and 3 represent upper and lower positively-driven feed-rolls adjacent to the shear 4. I show these rolls as having a plain intermediate feeding portion for the feeding of hoop-iron; but it will be readily understood that any desired section may be fed by suitably changing the contour of these rolls to correspond thereto. The lower of these rolls is flattened at one portion 5 of its circumference, so that when the rolls reach the position of Fig. 3 they cease to feed the metal, which is thus stopped once at each revolution of the rolls. The shear-blade 6 descends at this moment, severing the bar, and immediately rises before the rolls begin again to feed the bar.

To prevent the unfed portion of the bar from dragging back the portion between the rolls, thus changing the length of the portion which is severed, I provide a pair of friction-rolls 7 and 8 in the rear of the feed-rolls, one of these friction-rolls being held against the bar by a spring 9 or other suitable device. These rolls are driven merely by the metal passing through them, and serve to pinch and hold the same in any position to which it is carried by the feed-rolls, thus preventing back-drag.

10 is the driving-shaft, having a pinion engaging a toothed wheel 11 upon the shaft 12, which carries a cam 13, arranged to engage the end of a lever 14, pivotally connected by a link 15 to the shear-lever 16. A spring 17 holds the lever 14 in contact with the cam, and the shaft 12, to which the lower feed-roll is secured, is geared to the upper feed-roll shaft by toothed wheels 18, as shown. The cam is so arranged as to act at the moment that feeding ceases, as above described.

To start the bar into the rolls at such a point in their circumference that the length first carried through will be the same as those succeeding, I provide the apparatus of Fig. 6. In this figure 2′ and 3′ represent the feed-rolls corresponding to those of Fig. 1, the upper, however, in this case being a spring-pressed friction-roll driven from the lower, which is positively rotated. In the rear of these are placed the friction-rolls 7′ and 8′, the lower of which is stationary, while the

upper is held down by its own weight and is carried in a link 19, pivotally supported in a lever 20, at the other end of which is pivoted a depending stop 21, which reciprocates vertically through the upper of two guide-plates 22. A link 23 pivotally connects the lever 20 to a foot-lever 24, by means of which the roll 7′ may be raised for the insertion of the bar and the stop 21 at the same time lowered, thus preventing further inward movement of the bar. A cam 25 is secured to the shaft of the lower feed-roll, this cam having a short concentric rim portion 26, arranged to engage an idle-wheel 27, when such wheel is raised into contact with the lower friction-roll 8′, by swinging the hand-lever 28 in which it is carried.

The operation is as follows: The operator, pressing down upon the foot-lever 24, raises the upper roll 7′ and depresses the stop 21. He then pushes the bar in against the stop, and, releasing the foot-lever, the roll 7′ engages the bar and the stop rises. He then swings the roll 27 into engagement with the lower roll 8′, and the cam 25 in the rotation of the roll-shaft engages this roll 27 and drives thereby the roll 8′, thus carrying the bar forward to exactly the point desired in the circumference of the feed-rolls, which seize and feed it forward to the shear, giving the proper length. As soon as the cam has acted, the roll 27 is dropped and the feeding is automatic until the end of the bar is reached, when the operation is repeated with the next.

To provide for different lengths of section, I use a feed-roll such as shown in Fig. 7, having a series of grooves 29, 30, 31, and 32 of different depths, the upper roll having rings of different diameters corresponding thereto and interfitting therewith, thus giving in effect a series of feed-rolls of different diameters by which the length of the severed section can be changed, as desired.

In front of the shear and at right angles thereto I pivotally support a piler 33, which consists of a shaft having a series of projecting arms 34, arranged to receive the severed lengths one upon the other until the recess between them is filled, when a partial turn is given thereto and another recess brought into position. These recesses or slots may be plain, as shown in Figs. 8 and 9, and binders 35 placed in each recess at suitable points before it is brought into position to receive the sections, the binders then being bent down over the pile, or annular grooves 36 may be provided, as in Figs. 10 and 11, through which wires 37 are inserted below the pile and twisted over it, as shown in either case, the bound pile dropping below the piler upon a suitable conveyer, such as an endless chain.

The advantages of my invention will be apparent to those skilled in the art, since no complicated traveling shear is necessary, the bar stopping automatically as the shear operates. As the bar is started at the proper moment, the scrap end is made as short as possible, and different lengths of section are obtained by changing from one groove to another of the feed-rolls. The piler is simple and effective and avoids much hand-labor.

Many variations may be made by the skilled mechanic in the form and arrangement of the parts of my invention within the scope of the claims, since

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a shear, of feed rolls, at least one of which is provided on its surface with a flattened or reduced portion, and friction rolls in front of the shear and arranged to grip and hold the bar from which the shear cuts the length; substantially as described.

2. The combination with a shear, of feed rolls, at least one of which is provided on its surface with a flattened or reduced portion, and means for pushing the bar into these rolls at a predetermined point in their circumference, substantially as described.

3. The combination with a shear, of feed rolls, at least one of which is provided on its surface with a flattened or reduced portion, a pair of friction rolls, and mechanism for operating at least one of them at a particular point in the revolution of the feed roll; substantially as described.

4. The combination with a shear, of feed rolls, at least one of which is provided on its surface with a flattened or reduced portion, a pair of friction rolls, a stop, means for reciprocating one of the rolls and moving the stop into and out of position, and means for driving one of the friction rolls from the feed-roll; substantially as described.

5. The combination with a shear, of feed rolls, at least one of which is provided on its surface with a flattened or reduced portion, a pair of friction rolls, a stop, means for reciprocating one of the rolls and moving the stop into and out of position, and a friction wheel arranged to operatively connect a friction roll with a cam upon the feed roll shaft; substantially as described.

6. The combination with a pair of feed rolls arranged to advance the bar intermittently, of a shear, mechanism for actuating the shear while the bar is at rest, and a piler extending at right angles to the shear and having longitudinal radial arms between which the bars are moved longitudinally; substantially as described.

In testimony whereof I have hereunto set my hand.

ALLAN C. RYAN.

Witnesses:
H. KETCHINGHAM,
F. M. BRADY.