J. H. RAU.

MACHINE FOR MAKING WALL TIES.

APPLICATION FILED OCT. 18, 1907.

904,563. **Patented Nov. 24, 1908.**

2 SHEETS—SHEET 1.

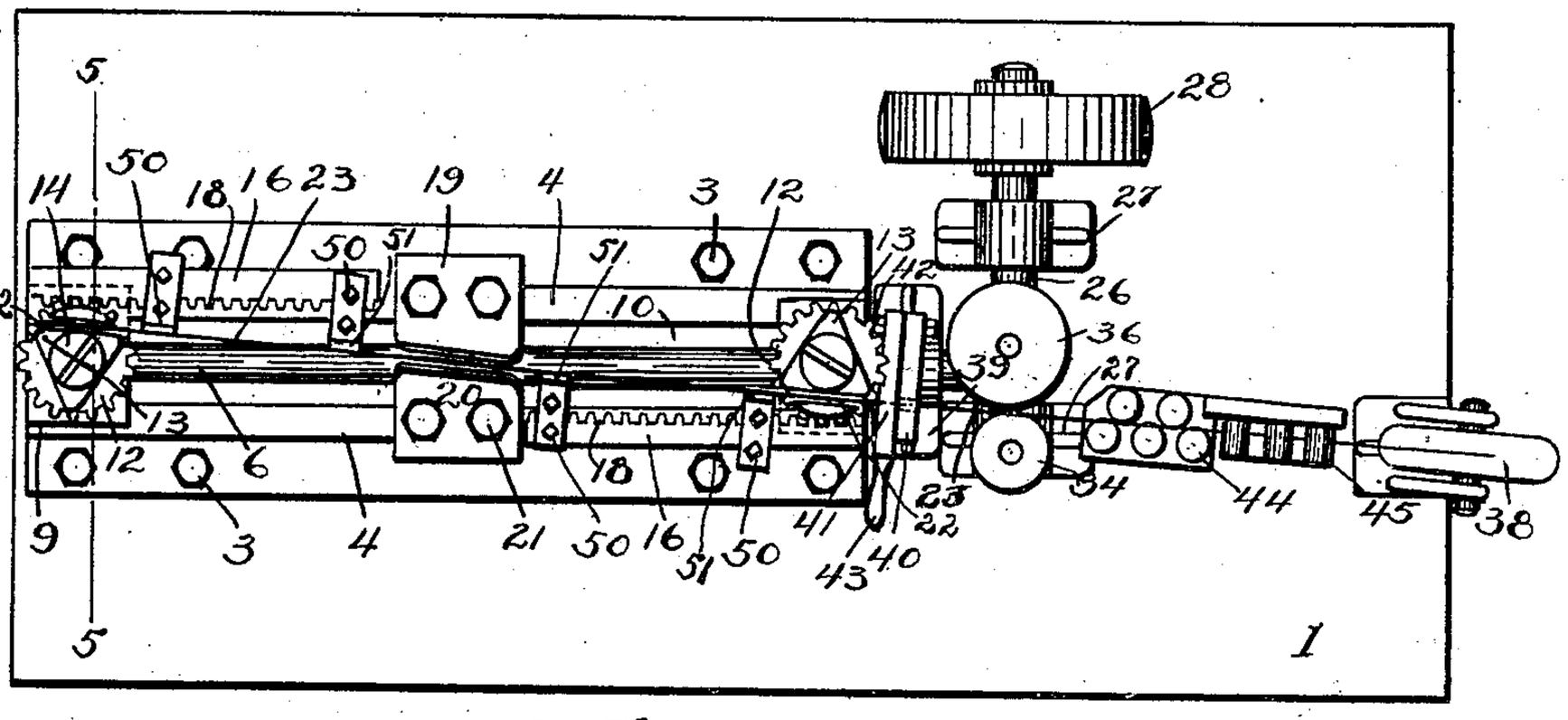

Fig. 1.

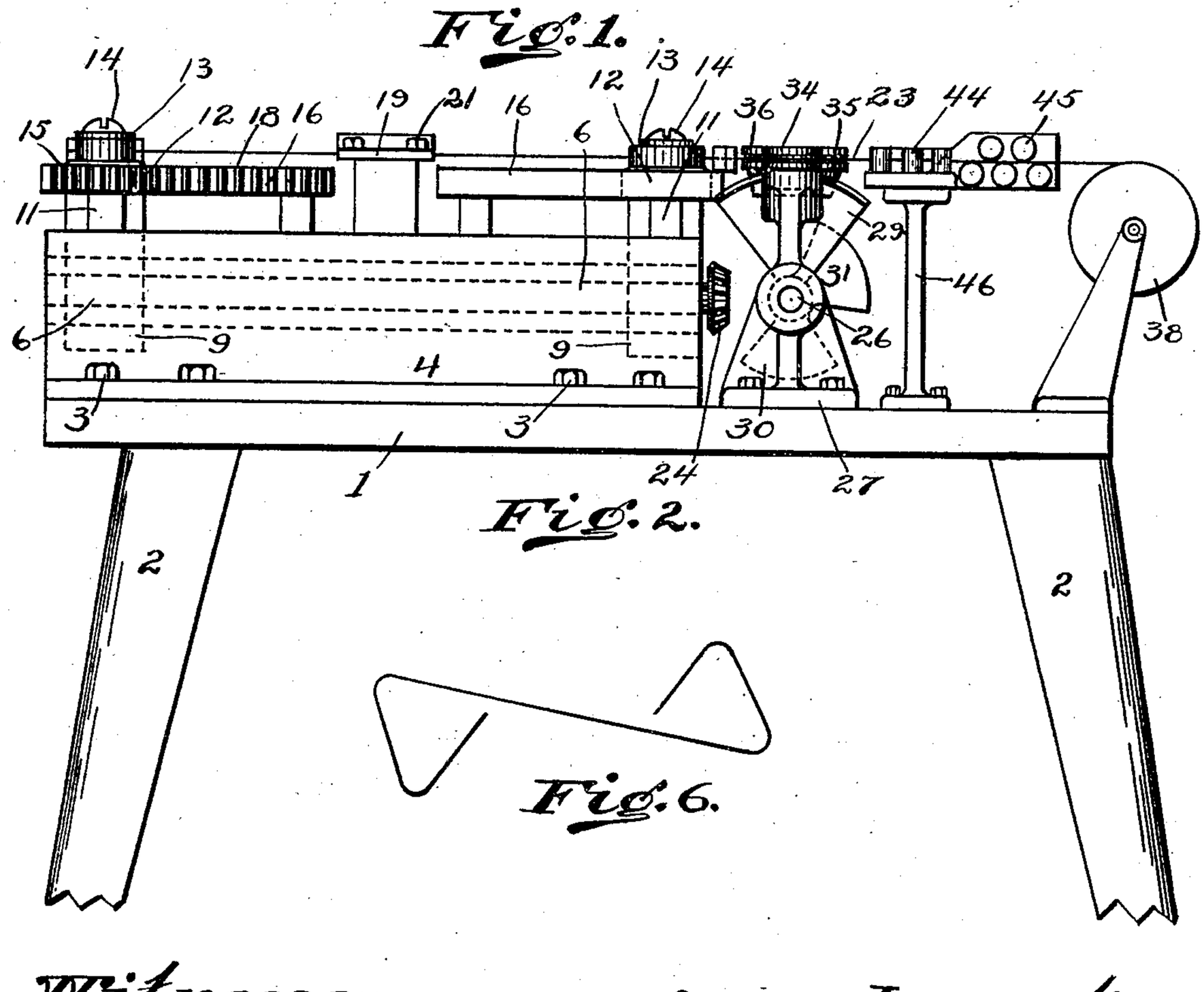

Fig. 2.

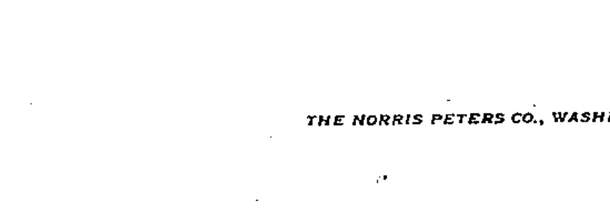

Fig. 6.

Witnesses
Geo. Smith
Kathryn Stelch

Inventor
John H. Rau
by Drew Strahl
Attorney

J. H. RAU.

MACHINE FOR MAKING WALL TIES.

APPLICATION FILED OCT. 18, 1907.

904,563. **Patented Nov. 24, 1908.**

2 SHEETS—SHEET 2.

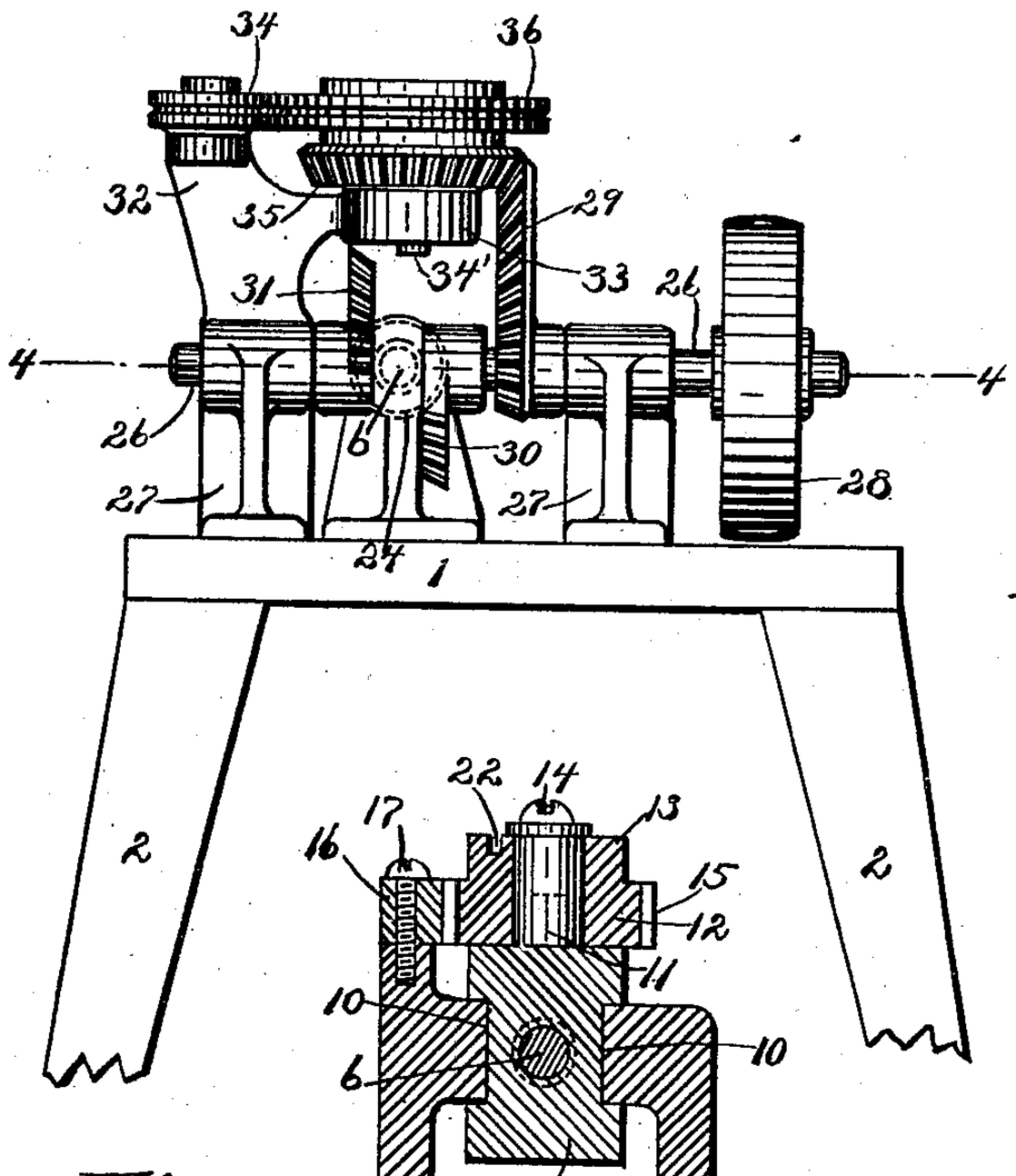

Fig. 3.

Fig. 5.

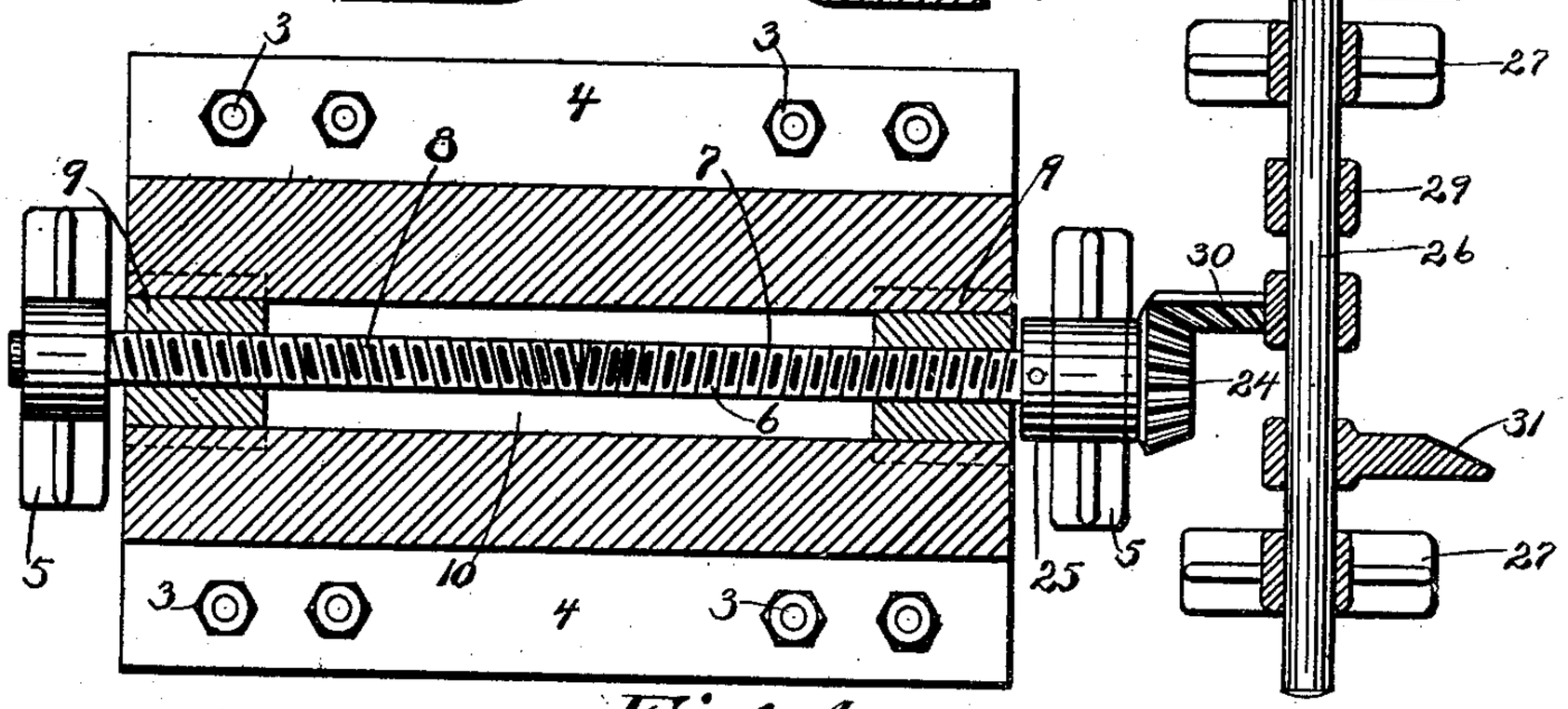

Fig. 4.

Witnesses

Geo. Smith

Kathryn Stehli

Inventor

John H. Rau

by Jno. W. Fecher

Attorney

UNITED STATES PATENT OFFICE.

JOHN H. RAU, OF CINCINNATI, OHIO, ASSIGNOR TO ALLAN R. RAFF AND OTTO CADEN, BOTH OF CINCINNATI, OHIO.

MACHINE FOR MAKING WALL-TIES.

No. 904,563. Specification of Letters Patent. Patented Nov. 24, 1908.

Application filed October 18, 1907. Serial No. 398,100.

To all whom it may concern:

Be it known that I, JOHN H. RAU, a citizen of the United States, residing at the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Machines for Making Wall-Ties, of which the following is a specification.

The object of my invention is to produce a cheap, simple and efficient mechanism for feeding lengths of wire to a set of mandrels on moving carriages, automatically moving said mandrels together so that the wire at each end is formed or wound over the mandrel to assume a definite shape (in the present instance triangular) and then automatically allowing said carriages with the mandrels to move apart and assume a normal position, ready to again come together with the next length of wire. The wire is by this operation formed into a wall tie shown in the drawing and is used in binding firebrick, terra cotta, hollow walls, stone ashler and the like in building operation.

The features of the invention and its advantages will readily become apparent from the following specifications and claims:

In the accompanying drawing forming part of this specification, Figure 1 is a plan view of my machine. Fig. 2 is a front elevation thereof. Fig. 3 is an end elevation thereof. Fig. 4 is a section on line 4, 4, of Fig. 3. Fig. 5 is a section on line 5, 5, of Fig. 1. Fig. 6 is a plan view of one of the wall ties made by the machine.

A framework or table 1 supported on legs 2 is provided. On this table, I connect by screws 3 guide pieces 4, 4, preferably of the form shown in Fig. 5. They may be made of any other shape. These guide pieces 4, 4, extend up a line with the length of the table and stand up at a right angle thereto. On supports 5, 5, and journaled or housed therein is a screw or shaft 6, having at one end a right-hand thread 7 and at its other end a left-hand screw-thread 8. At each end on the screw 6, I provide a carriage 9 which works in the space 10 (see Figs. 1 and 5). This carriage is preferably of an I beam shape, so as to properly travel in the space 10 and be supported in position on the guides 4, 4. This carriage may be of any other shape or contour. These carriages 9, 9, have hollow posts as 11 extending up from their upper faces (see practically Fig. 5). A gear wheel 12 and a mandrel 13 made integral are slipped over the hollow post 11 and held in place by a screw 14. The teeth on gear 12 are marked 15. The mandrel 13 in the present instance is triangular in shape. It may be of any other shape and the mandrel 13 and gear 12 be made separate or integral as desired.

At each side of the guards or guide ways 4, 4, at their top edge and at the points where the gear 12 and mandrel 13 work and operate, I provide racks as 16 screwed in place on the guide pieces 4 by screws 17; the racks having teeth 18 (see practically Fig. 5). The teeth 15 on gear 12 mesh with teeth 18 on rack 16 when the machine is operating.

The screw 6 passes through the carriages 9, 9, the carriages being bored and screw threaded, so that the screw threads on the shaft or screw 6 will when operating force the carriages 9, 9, to move towards or away from one another, that is, inward and outward.

On the racks 16, at their top edge, I fasten guide fingers 50 (two on each rack) one extending inwardly to a greater degree than the other, their inner edges being inclined so that they can support and guide the wire in its diagonal position. The wire bears against the inclined upturned edges 51 of said fingers and impinges against said edges when being wound around the mandrels 13.

A central guide piece and support 19 is provided. It is of shape shown in Fig. 1, carries a diagonal recess 20, and is screwed to the guide pieces 4, 4, by screws 21. The mandrels 13 are also each provided with such a diagonal recess marked 22. The wire or strips 23 lies in these recesses 20 and 22 so as to be guided, supported and held in a position while being operated upon.

At one end screw or shaft 6 is provided with a gear wheel 24, a collar 25 (see Fig. 4) holding the shaft 6 and thus the gear 24 in proper line and preventing play.

I will now describe the mechanism which operates the screw shaft 6.

A shaft 26 housed on supports 27 is provided. At one end the shaft carries a pulley 28. On this shaft 26 I connect in some suitable manner three segmental gears or sectors 29, 30 and 31; the smaller sectors 30 and 31 mesh with the gear 24 on screw 6, alternating in their contact with said gear, one, say sector 30 when in contact with gear 24,

moving the screw so that the carriages 9, gear 12 and mandrels 13 will move towards each other or inward and say when sector 31, meshes with gear 24, the said mechanism will move apart, away and back into normal position. In this operation the teeth 15 on gear 12 mesh with the teeth 18 on racks 16.

The larger sector gear 29 is connected with the mechanism for feeding the wire, which I shall now describe. One of the supports 27 (see Fig. 3) extends upward forming arms 32 and 33. In arm 32 is journaled small wire feed roller 34 and on arm 33 on a short shaft 34′ is fastened a gear wheel 35 and a large wire feed roller 36 (see Fig. 3). The wire 23 off roll 38 passes between these rollers 34 and 36 and is fed by them into the machine. When the sector 29 meshes with gear 35, the large roller 36 is turned and it turns the small roller 34, the wire 23 between them and feeds it forward, when the sector gear 29 is not in mesh with the gear 35 the feeding of the wire stops and at this time it is necessary to cut the wire as the requisite length of wire has been fed and this mechanism for cutting the wire I shall now describe.

On a support 39 at end of guide 4, 4, (see Figs. 1 and 2) I provide and connect in any suitable manner an edge 40 and a cutter knife 41, pivoted or hinged at 42 and operated by handle 43. The operator by pushing down the cutter knife 41, cuts the wire. Any other form of cutter or cutting mechanism may be employed for severing the wire into desired lengths.

The wire before it passes into the machine must be straight. For this purpose I provide one of the ordinary straightening devices consisting of a series of guides and rollers 44, 45, supported on a support 46 (see Figs. 1 and 2). The wire 23 in passing through this series of guides and rollers 44, 45, has all kinks and uneven places removed and passes into the machine even and straight.

The machine operates as follows, to wit: A belt (not shown) is placed over the pulley 28 turning the pulley and thus revolving the shaft 26. Sector 29 being on this shaft 26, it is revolved therewith and when it comes in contact and meshes with gear 35, and consequently the roller 36 is revolved, imparting motion to roller 34 carrying wire 23 between them and feeding it into the guides. As soon as the sector 29 has passed over the face of gear wheel 35, the feeding stops, as enough wire has been fed into the machine to make one wall tie. At this point and while the feeding is stopped, the operator cuts the wire with cutter knife 41 by working it with the handle 43 (see Fig. 1). At this point the mechanism for forming the tie comes into play, as the shaft 26 also causes the sector gears 30 and 31 to revolve with it. In revolving the teeth on sector gears 30 and 31 mesh the teeth on gear 24, which gear 24 being on screw 6 causes said screw to revolve and by revolving said screw shaft 6, the carriages 9, carrying the gears 12 and mandrels 13 are forced to move inward or toward each other, the teeth 15 on gear 12 meshing with the teeth 18 on racks 16, the gears 12 and mandrels 13 are revolved in posts 11. This revolution forces the wire strip 23 to form around the mandrels 13 (at each of its ends); that is, the wire is wound around the mandrels and the mandrels being of a triangular shape, a triangle is made at each end of the wire and the wall tie shown in Fig. 6 is the result. As soon as the tie is formed it is removed and the mechanism just described is moved back into normal position ready to form another wall tie. When the sector gear 30 is meshing with gear 24 and shaft 6 is revolved, the mandrel mechanism is forced to move inward towards the center to form the tie and when sector gear 31 is meshing with gear 24 and shaft 6 is revolving the mandrel mechanism is moving apart or away from the center back into a normal position ready to receive another strip of wire to form another wall tie. By this alternate meshing of the sectors 30 and 31 with gear 24 and the right and left-hand screw threads on shaft 6, and the movement of carriages 9 governed by the screw shaft revolutions, the mandrels and accompanying parts are moved towards or from each other as described. The gear wheel 12 is of such a diameter and the rack 16 of such length, the sectors 30 and 31 of such length of face that when the sectors 30 or 31 have passed over the face of gear 24 and the gear 12 made its revolution the mandrels will have formed the wall tie.

By using sector gear of less or greater face and gears of less or greater size than gear 13, and shorter or longer racks, and mandrels of different sizes, varying sizes of wall ties can be made.

Any other mechanism than that herein described, may be employed for feeding the wire and cutting it into lengths. The mandrels and mandrel mechanism may be otherwise formed and operated.

What I claim as new and of my invention and desire to secure by Letters Patent is:

1. In a machine for making wall ties, means for operating the same, means for cutting the wire in combination with means for guiding and supporting the wire in the machine, carriages, mandrels mounted on said carriages, gear wheels attached to said mandrels, racks placed on the machine at each side of the carriages, the carriages carrying the mandrels moving toward and away from each other, the mandrels revolving as the carriages are in operation, by means of the gears on the mandrels meshing

with the racks as the said carriages are moving toward and away from each other to form the wall tie, the racks being stationary and the carriages and mandrels operating between said racks, as set forth.

2. In a machine for making wall ties, means for guiding and supporting the wire in the machine, mandrels, mechanism for forcing said mandrels towards and away from each other, the mandrels turning in opposite directions, means for holding the wire against the mandrels as they revolve to form a wall tie, as set forth.

3. In a machine for making wall ties, means for guiding and supporting the wire in the machine, mandrels, mechanism for forcing said mandrels towards and away from each other, means for holding the wire against the mandrels as they revolve, said wire supported and resting diagonally between said mandrels so that loops will be formed on opposite sides of the wire to form a wall tie, as set forth.

Cincinnati, Ohio, October 9th 1907.

JOHN H. RAU.

Witnesses:

JNO. W. STREHLI,

LESTER RAU.