G. BERGHAUSEN.

MACHINE FOR FORMING STOVEPIPE.

APPLICATION FILED APR. 30, 1909.

947,291.

Patented Jan. 25, 1910.

2 SHEETS—SHEET 1.

Fig. 2

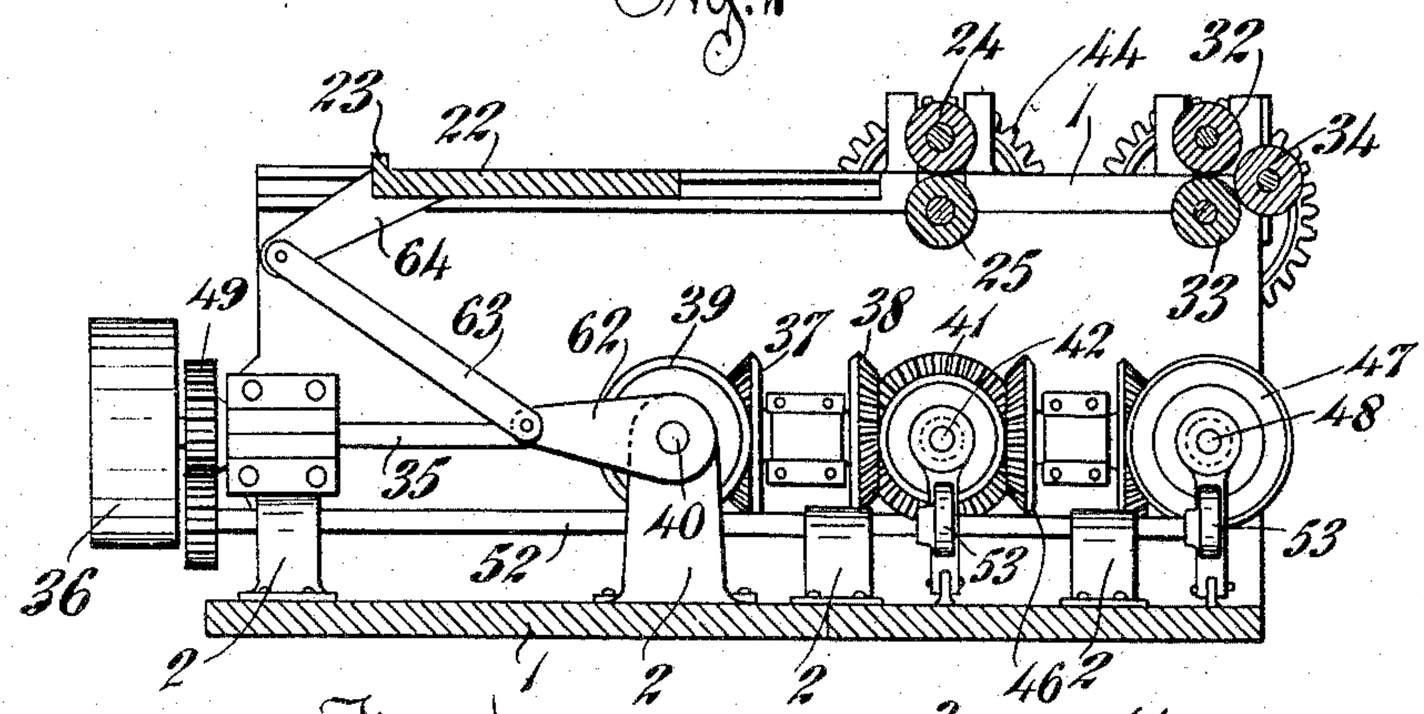

Fig. 1

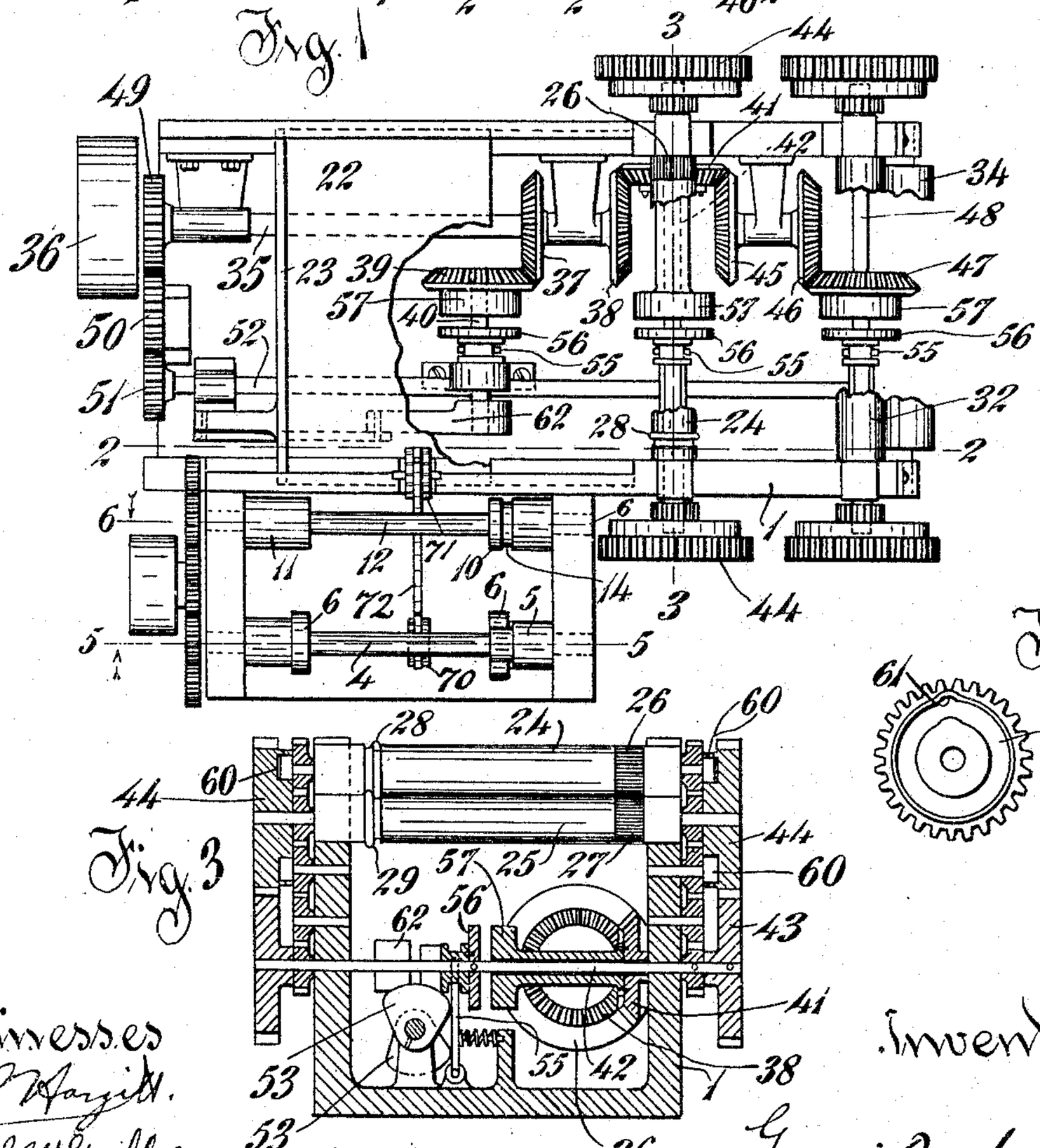

Fig. 4

Fig. 3

Witnesses
R. F. Hazzitt.
Earl W. Griffin

Inventor
Georg Berghausen
by Alfred M. Allen
Atty

G. BERGHAUSEN.

MACHINE FOR FORMING STOVEPIPE.

APPLICATION FILED APR. 30, 1909.

947,291.

Patented Jan. 25, 1910.

2 SHEETS—SHEET 2.

Fig. 5

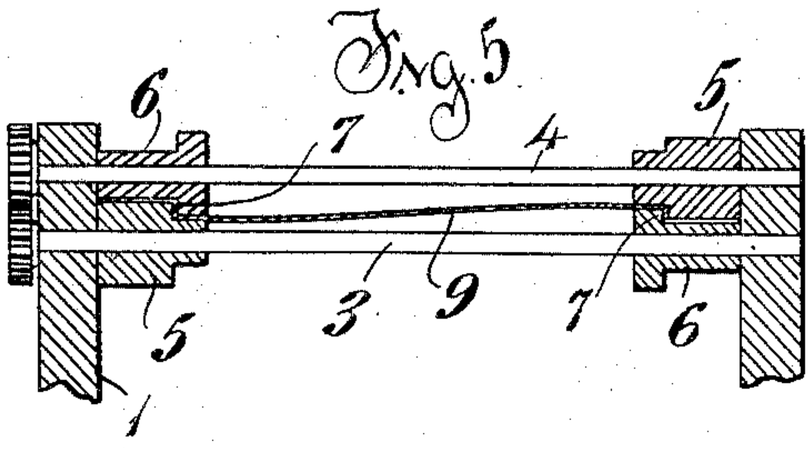

Fig 6

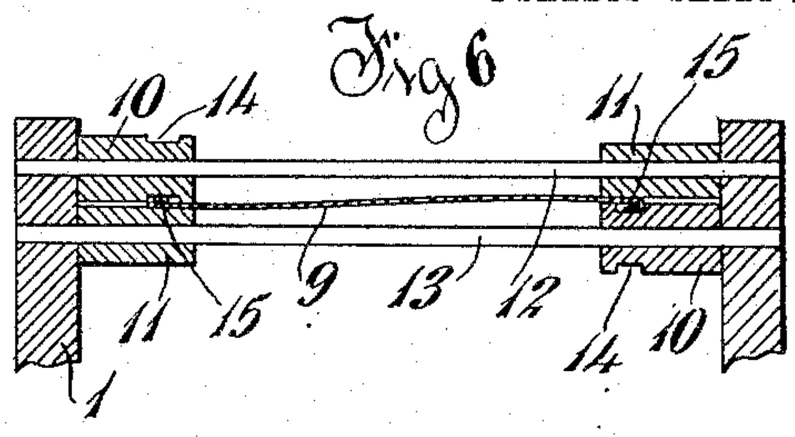

Fig 7

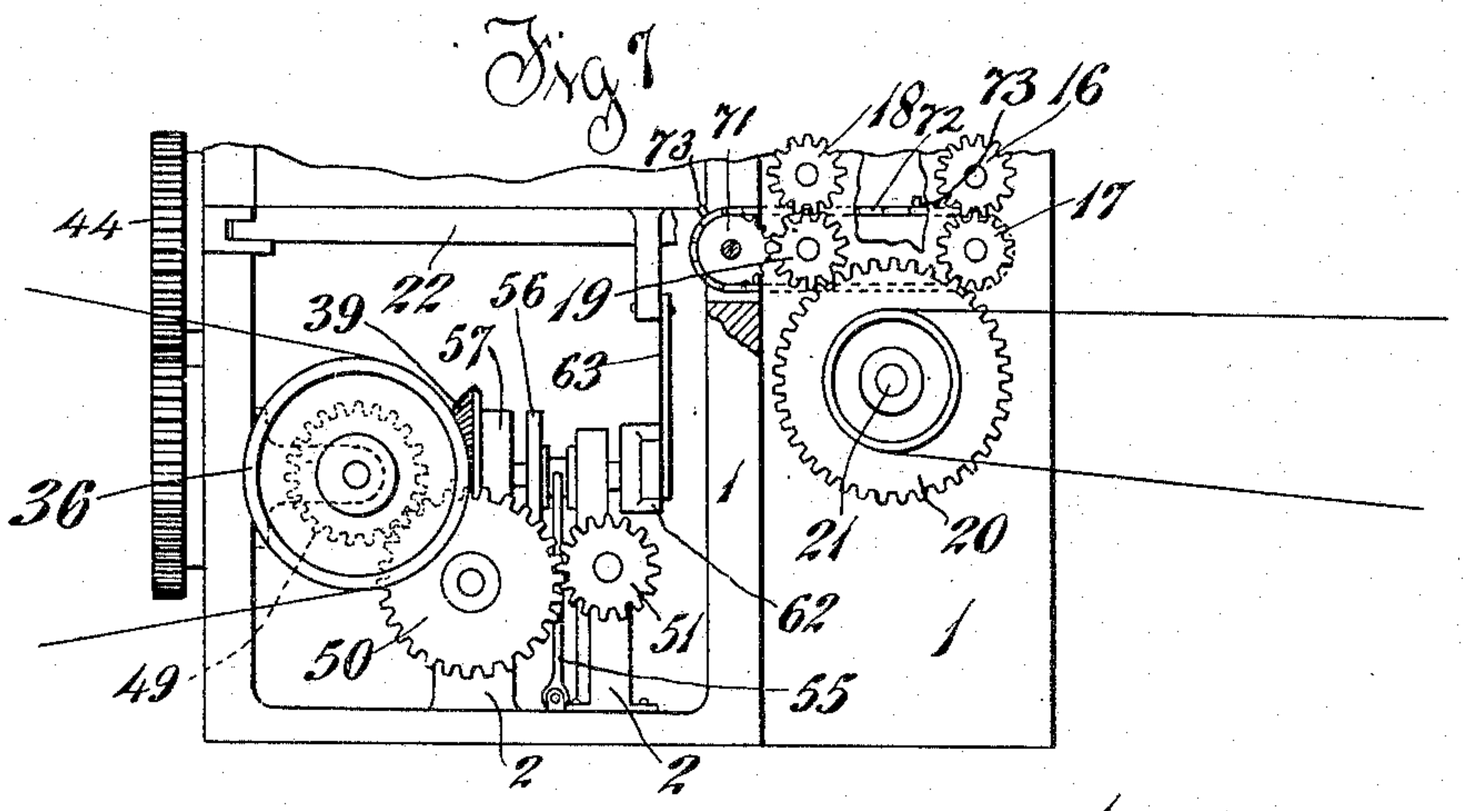

Fig. 8

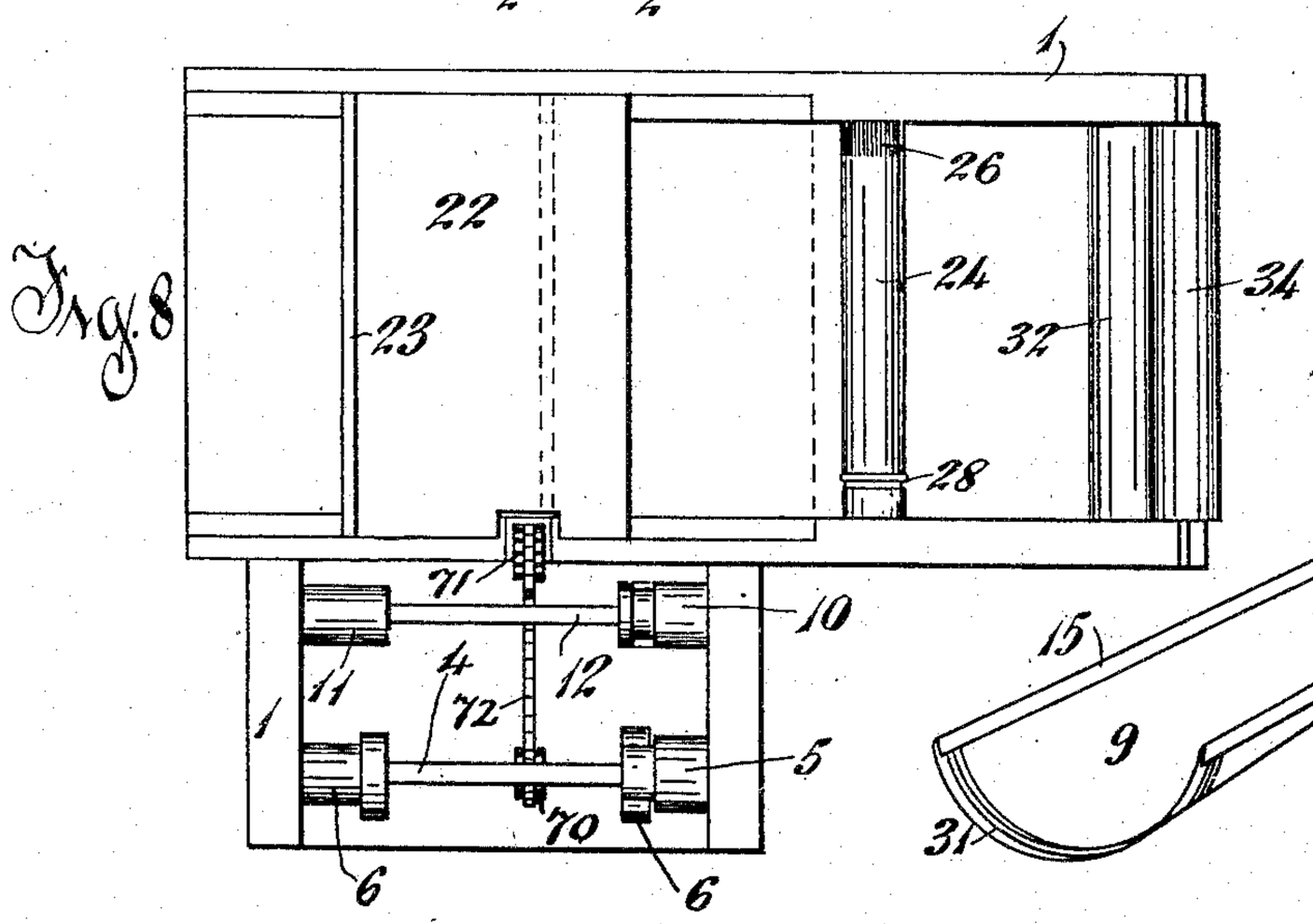

Fig. 9

Witnesses

P. C. Hanjith.

Earl W. Griffin

Inventor

George Berghausen

by Alfred M. Allen

Atty

UNITED STATES PATENT OFFICE.

GEORGE BERGHAUSEN, OF CINCINNATI, OHIO.

MACHINE FOR FORMING STOVEPIPE.

947,291. Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed April 30, 1909. Serial No. 493,204.

To all whom it may concern:

Be it known that I, GEORGE BERGHAUSEN, a citizen of the United States, residing in the city of Cincinnati, county of Hamilton, and State of Ohio, have invented certain new and useful Improvements in Machines for Forming Stovepipe, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

In the manufacture of stove pipe, strips of sheet metal are cut of the proper size for the length and diameter of the pipe, and the longitudinal sides of the sheet are then bent over in reverse directions to form longitudinal hooks; one of the ends is then crimped to adapt this end to fit more readily into the next length of pipe when the lengths are put together, and a bead formed parallel with and a short distance within the opposite end to form a stop for the end of the next section of pipe inserted therein when putting the pipe together. The sheet is then curved on a mandrel so that the hooked sides may be readily locked together, and the skelp is sold by the manufacturer in this semi-cylindrical condition for the tinsmith to lock the edges together, and groove or press down the longitudinal seam to form the complete pipe.

It is the object of my invention to provide a single machine in which the various operations above outlined, shall be performed automatically, the sheet of material fed from place to place and acted upon to complete the skelp in one continuous operation.

The invention consists of the certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed.

In the drawings Figure 1 is a top plan view of my improved machine, with some of the parts partly broken away to show the construction. Fig. 2 is a sectional side elevation taken on the lines 2, 2 of Fig. 1. Fig. 3 is a cross section taken on the lines 3, 3 of Fig. 1. Fig. 4 is a detailed view of one of the cams for raising the crimping and beading rolls. Figs. 5 and 6 are longitudinal sections of the hook forming rolls taken on the lines 5, 5 and 6, 6 of Fig. 1. Fig. 7 is an end view of the machine. Fig. 8 is a plan view of the frame, and some of the operating rollers illustrate the position of the sheet metal as it passes through the machine. Fig. 9 is a perspective view of the finished skelp.

1 constitutes the framework for holding the operating parts upon which the standards 2, 2, are erected, in which some of the operating shafts are journaled. At the front end of the machine and journaled in the side frame are the shafts 3, 4 which carry the tongued and grooved rollers 5, 6, 5, 6, at either end, spaced apart so as to form a short right angle bend 7, 7, along the longitudinal sides of the sheet metal strip 9, which is passed between them, and the sheet is then passed between the rollers 10, 11, 10, 11, mounted on the shafts 12, 13, journaled in the framework. The upper roll 10 on one end and the lower roll 10 on the other being provided with the annular groove 14, to receive the angular bent portions of the sheet and bend same over to form hooks 15, 15 on each side. These hook forming rolls are driven at the proper speed by the pinions 16, 17, 18 and 19 in train with the gear 20 on the driving shaft 21. The sheet after passing through the hook forming rolls is delivered to the carrier 22 which carrier is in the shape of a flat table or frame arranged to slide horizontally in suitable grooves in the framework, and in a path at right angles to the feed of the strip through the hook forming rolls. This carriage is provided with a flange 23 to serve as a pusher for the sheet as the carrier is moved. In order to deliver the sheet 9 properly to the carrier 22, I provide a sprocket chain conveyer mounted in the space between the shafts 3, 4 and 12, 13. Mounted on the sprocket wheel 70 on the shaft 3, and the sprocket wheel 71, journaled in a recess in the side edge of the frame is the endless sprocket chain 72 which chain carries pushers 73 arranged at proper intervals on the chain. These pushers deliver the sheets 9 as they leave the hook forming rolls to the carrier. The carrier is actuated intermittently to feed the sheets as they are delivered to it to the crimping and bead forming rolls 24, 25, the lower one of which is journaled in fixed bearing in the frame, and the upper one journaled in a slidable journal bearing so that at the proper time the upper roll can be raised to permit the hooked sides of the sheet to pass thereunder. These crimping and bead forming rolls are provided with crimping surfaces 26, 27 at one end, and bead forming surfaces 28, 29 at the other, so that the sheet in passing between

these rolls will be crimped as shown at 30 in Fig. 9 at one end, and the bead 31 formed at the other. The sheet is then passed between the rolls 32, 33 and against the roll 34, which are journaled across the framework in order that the semi-cylindrical bend to the sheet may be given. The rolls 33, 34 are mounted in fixed bearings in the frame, while the roll 32 is mounted in slidable bearings so that at the proper time this latter roll may be raised to permit of the passage of the hooks 15, 15 on the sheet.

The carriage for the table and the crimping and bending rolls are all operated intermittently and in proper timed relation to each other by trains of gearing which are driven continuously and arranged to be thrown into operation with their respective operating devices by a series of friction clutches operated by a series of cams so timed, that the desired operation shall be performed in proper consecutive order.

35 is the main driving shaft of the machine suitably journaled in the framework, and provided with the driving pulley 36. This shaft carries the beveled gears 37, 38 one of which meshes with the beveled gear 39 loosely mounted on the shaft 40, upon which is mounted the operating mechanism for the carriage. The beveled gear 38 meshes with the beveled gear 41, loosely mounted on the shaft 42, which carries on its outer end the gear 43, meshing with and driving the gear 44 on the crimping and beading roll 25. The beveled gear 41 also meshes with the beveled gear 45, which carries the beveled gear 46 meshing with the beveled gear 47 loosely mounted on the shaft 48, which, through intermediate gearing, drives the bending rollers 32, 33, 34. The main driving shaft 35 also carries the gear 49 which, through the idler 50, drives the gear 51 on the cam shaft 52 journaled lengthwise in the framework. This shaft 52 carries for each of the operating devices cams 53, 53 and these cams are arranged to contact at proper times, each with a forked lever 55, the upper end of which engages with an annular groove in a sliding friction plate 56 one of which is keyed to each shaft 40, 42 and 48 so that under the action of these cams at proper intervals, the shafts are coupled to their respective continuously running beveled gears 39, 41 and 47, each of these gears being provided with a friction disk 57.

In order to raise the rollers 24 and 32 at the proper time to allow for the passage of the hooks 15, 15 of the skelp, I provide as follows: The gears of the lower rolls 25 and 33 are provided on their inner faces with the cam groove 60 as shown in Fig. 4. This groove is circular except for a single raised portion 61, and the ends of the shafts of the upper rollers 24 and 32 ride in their respective grooves in these gears, and as the journal bearings for these upper rollers are slidable as heretofore described, at one point in the rotation of the roll, the roll will be raised at each end and this position is properly timed so as to raise these rolls to permit the hooks 15 of the skelp to pass without damage.

The carriage 22 is moved back and forth to feed the sheets to the crimping and beading rollers by the crank arm 62 on the shaft 40, which is connected by the link 63 with the depending arm 64 from the carrier. As heretofore stated, the movements are all properly timed so that the various parts shall act in proper order.

While I have described the hook forming, crimping and bending rolls as operated by trains of gearing, and the timing of the various operations determined by the operation of the cams on the cam shaft arranged to actuate the friction clutch mechanisms, it will be understood that various modifications of the particular mechanical methods for actuating the various rolls can be adopted without departing from the spirit of my invention.

The operation of the parts will be obvious from the foregoing description. The sheet metal for each section of pipe is cut of the proper dimensions and fed in between the hook forming rolls. Before the sheet has left the first set of rolls it is caught by the second set and the hooks completely formed, and the sheet automatically fed on to the carriage 22 alongside of the flange 23 thereon. The friction clutch on the shaft 40 is then thrown into operation by the proper cam 53 and the carriage moves forward and just as the edge of the strip is presented between the rolls 24, 25, the upper roll rises to permit the hook to pass and then the upper roll drops and the sheet is fed between the rolls 24, 25, and crimped and beaded. The distance between these rolls and the bending rolls 32, 33 and 34 is such that just as the sheet is leaving the first set it is presented between the second set and the roller 32 rises to allow the hook on one side to pass the rollers 32, 33 before the roller 24 rises to release the sheet, and in this way the sheet is carried between the rolls 32, 33 and curved upward against the roll 34 which roll is slightly removed from the rolls 32, 33 so that there is no contact therewith, and the roll 34 acts merely as a rotating back which is moved by contact with the sheet, and allows the sheet to pass upward and receive its semi-circular bend.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks,

crimping and bead forming rollers to crimp and bead the same, and an automatic feed table to which the sheet is delivered from the end bending rollers to feed the sheet intermittently to the crimping and bead forming rollers.

2. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks, crimping and bead forming rollers mounted in a plane at right angles to the end bending rollers, and means for intermittently feeding the sheet to the crimping and bead forming rollers in a path at right angles to the delivery from the end bending rollers.

3. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks, crimping and bead forming rollers mounted in a plane at right angles to the end bending rollers, and means for intermittently feeding the sheet to the crimping and bead forming rollers in a path at right angles to the delivery from the end bending rollers, with means for separating the crimping rollers to permit of the passage of the bent over portion of the sheet.

4. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks, crimping and bead forming rollers mounted in a plane at right angles to the end bending rollers, and means for intermittently feeding the sheet to the crimping and bead forming rollers in a path at right angles to the delivery from the end bending rollers, and bending devices to bend the sheet into finished form.

5. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks, crimping and bead forming rollers mounted in a plane at right angles to the end bending rollers and means for intermittently feeding the sheet to the crimping and bead forming rollers in a path at right angles to the delivery from the end bending rollers, bending rollers to receive the sheet from the crimping rollers, and means for separating the crimping and bending rollers at predetermined times to permit of the passage of the bent over portion of the sheet.

6. In a machine of the class described, a series of rollers for bending the ends of a sheet of suitable sheet metal to form hooks, a pair of crimping and bead forming rollers to crimp and bend the sheet on the ends adjacent to the hooks, and feeding mechanism to feed the sheets intermittently to said crimping rollers, one of each pair of said rollers being provided with slidable bearings, a gear for driving said rollers, with disks provided with cam grooves connected to said gear, with one of said rollers in engagement with said grooves, whereby the rollers are separated at predetermined intervals.

GEORGE BERGHAUSEN.

Witnesses:
ARTHUR H. EWALD,
BESSIE A. BEALL.