Nov. 3, 1931. J. E. GORTNER 1,830,357

RADIATOR FIN WINDING MACHINE

Filed Oct. 4, 1930 4 Sheets-Sheet 1

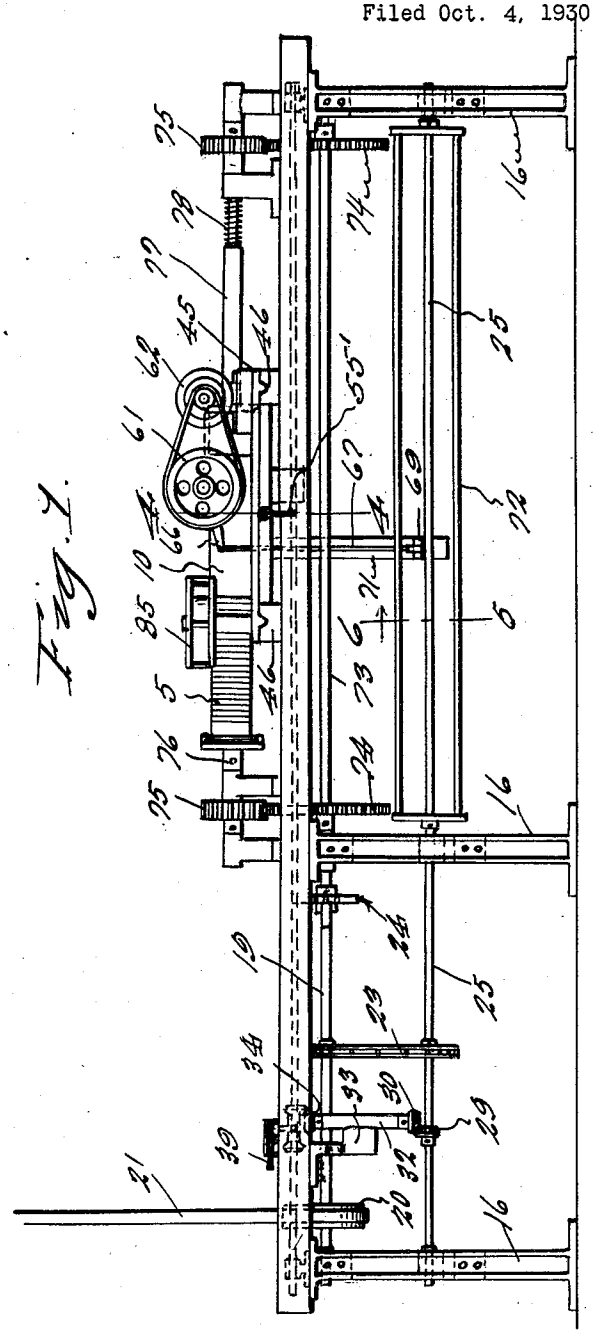


Fig. 1.

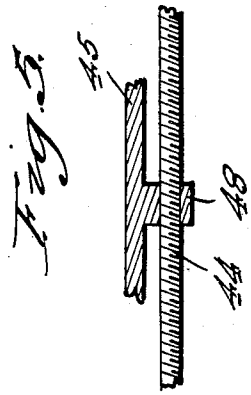


Fig. 2.

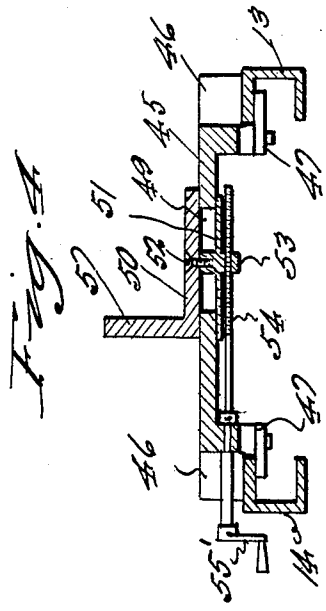


Fig. 4.

Inventor
James E. Gortner

By Clarence A. O'Brien
Attorney

Nov. 3, 1931. J. E. GORTNER 1,830,357

RADIATOR FIN WINDING MACHINE

Filed Oct. 4, 1930 4 Sheets-Sheet 2

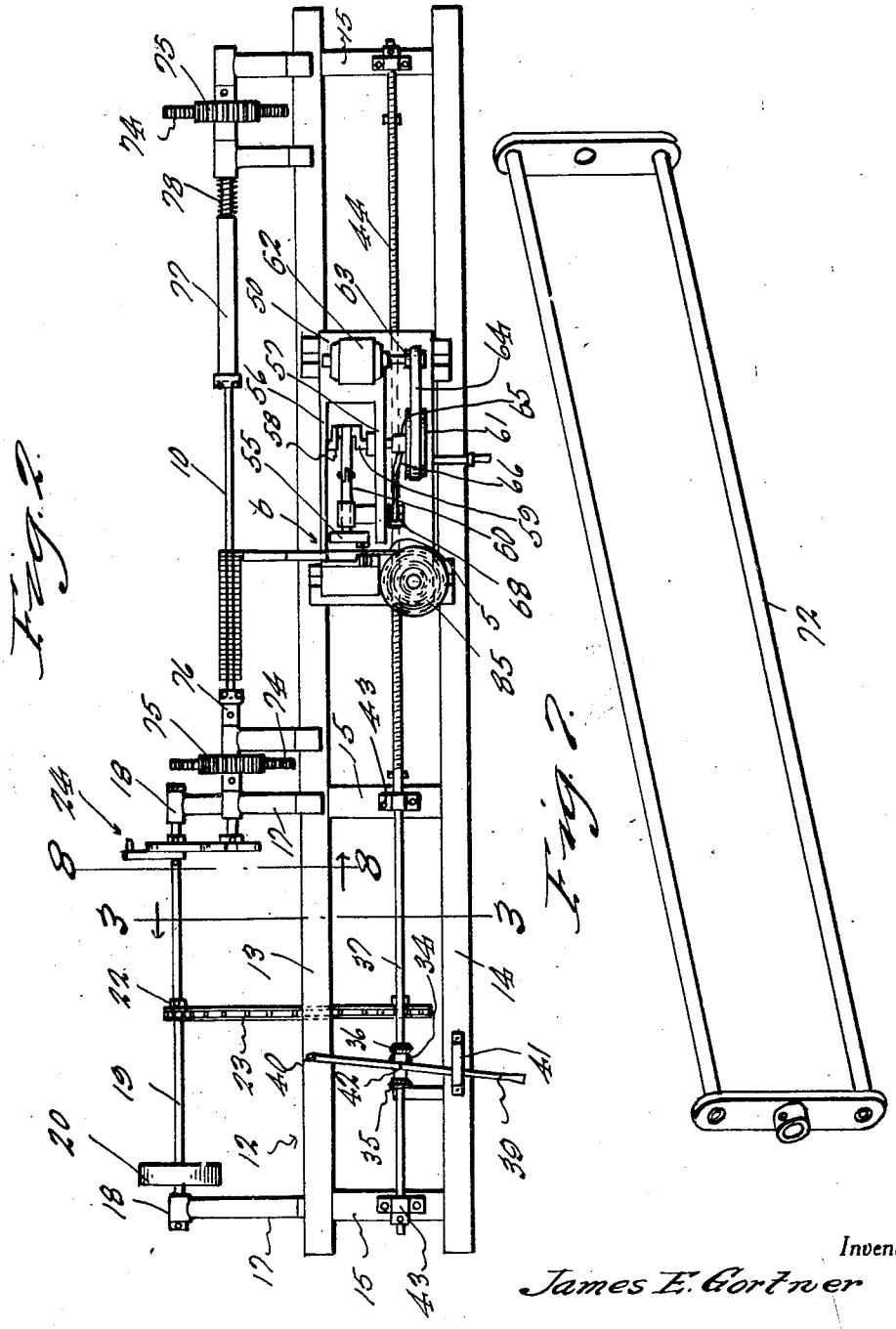


Fig. 1.

Fig. 2.

Inventor
James E. Gortner

By Clarence A. O'Brien
Attorney

Nov. 3, 1931. J. E. GORTNER 1,830,357

RADIATOR FIN WINDING MACHINE

Filed Oct. 4, 1930 4 Sheets-Sheet 3

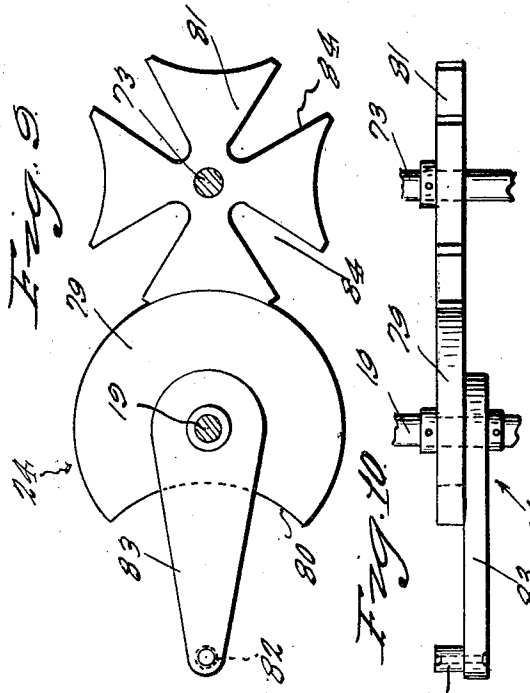


Fig. 9.

Fig. 10.

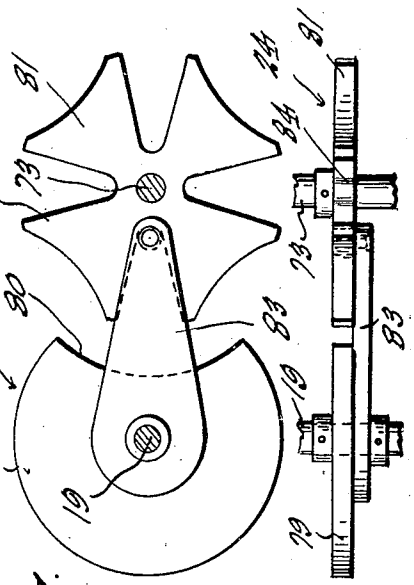


Fig. 11.

Fig. 12.

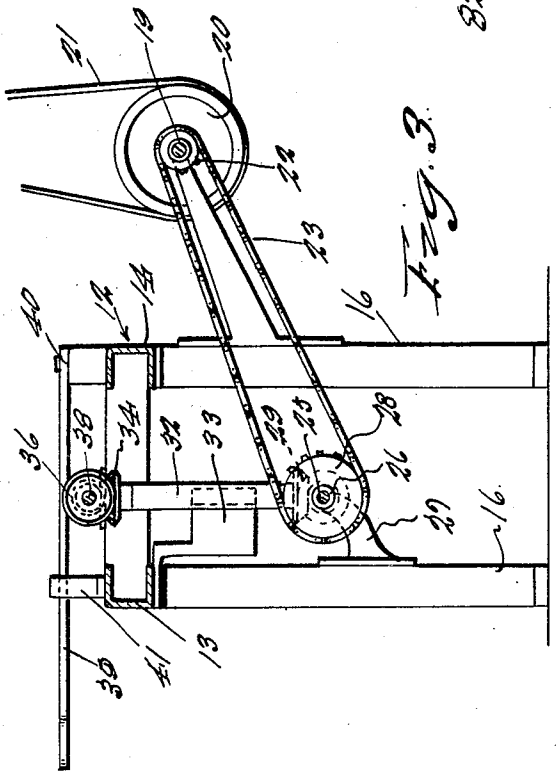


Fig. 3.

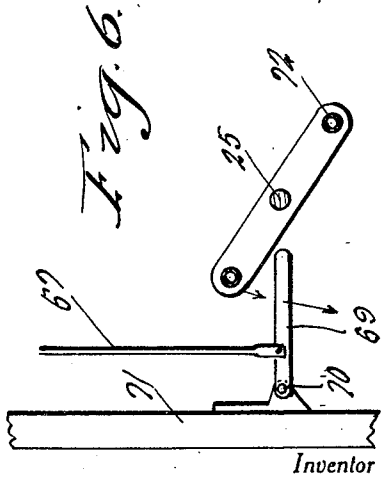


Fig. 6.

Inventor

James E. Gortner

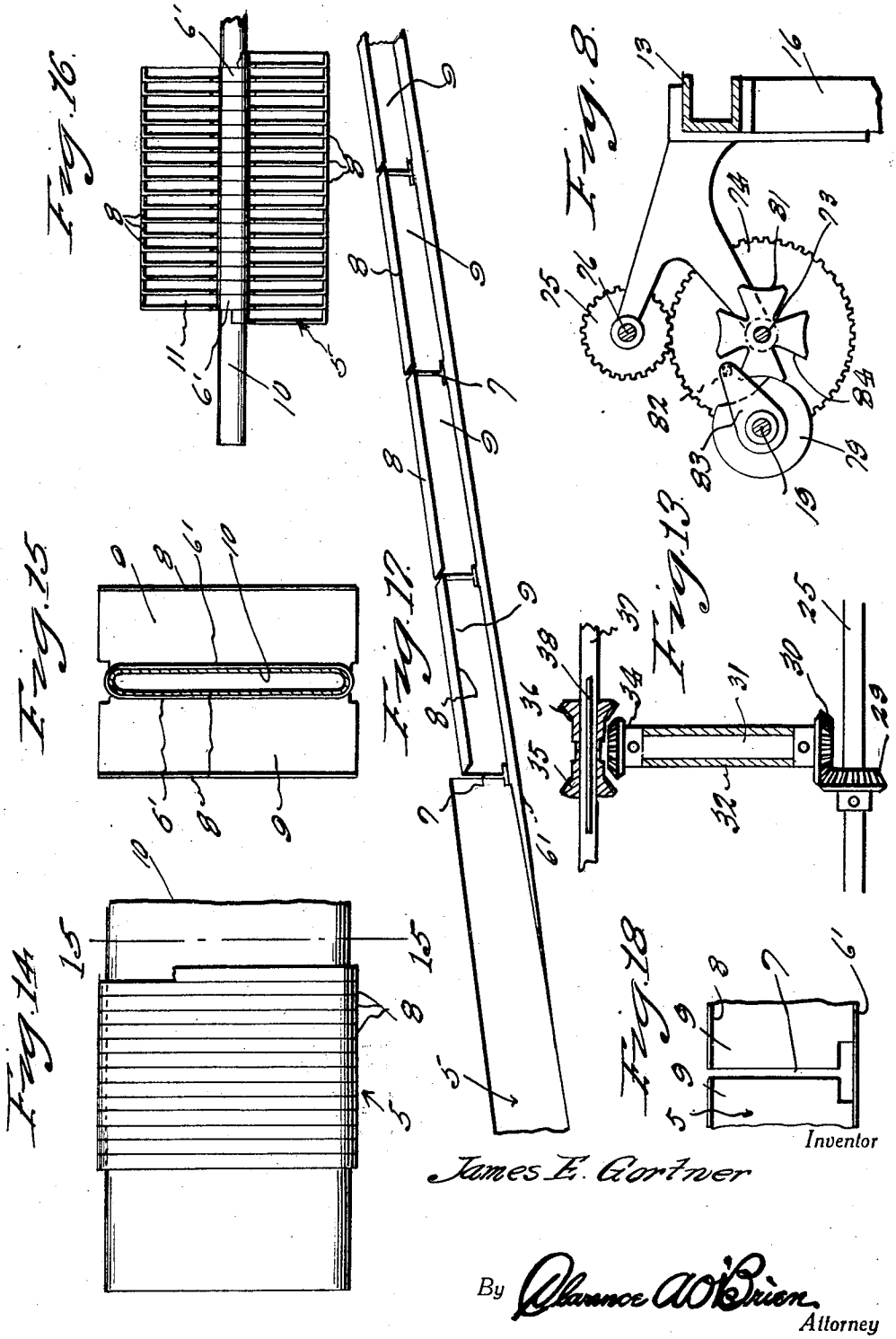
By Clarence A. O'Brien

Attorney

Nov. 3, 1931. J. E. GORTNER 1,830,357

RADIATOR FIN WINDING MACHINE

Filed Oct. 4, 1930 4 Sheets-Sheet 4



Patented Nov. 3, 1931 1,830,357

UNITED STATES PATENT OFFICE

JAMES E. GORTNER, OF SHAMOKIN, PENNSYLVANIA

RADIATOR FIN WINDING MACHINE

Application filed October 4, 1930. Serial No. 486,462.

The present invention appertains to new and useful improvements in winding machinery, and more particularly to a machine for winding fins on radiator tubes.

The principal object of this invention is to provide a machine wherein the radiator cooling fin is stamped and preliminarily formed, and subsequently applied to the radiator tubing.

Among the remaining objects of the invention is the provision of a winding machine of the character stated wherein the radiator tubing is maintained stationary during the operation of stamping and forming the radiator fin strip.

Other important objects and advantages of the invention will be found in the following specification.

In the drawings:—

Figure 1 represents a side elevational view of the novel machine.

Fig. 2 represents a top plan view of the machine.

Fig. 3 represents a view taken substantially on the line 3—3 of Fig. 2.

Fig. 4 represents a sectional view taken substantially on the line 4—4 of Fig. 1.

Fig. 5 represents a longitudinal sectional view disclosing the feed means for the strip roll and punch carriage.

Fig. 6 represents a sectional view taken substantially on the line 6—6 of Fig. 1.

Fig. 7 represents a perspective view of the clutch operating frame shown clearly in Figs. 1 and 6.

Fig. 8 represents a transverse sectional view taken substantially on the line 8—8 of Fig. 2.

Fig. 9 represents a transverse sectional view enlarged to show the Geneva movement device in one position.

Fig. 10 represents a fragmentary top plan view of the Geneva movement device.

Fig. 11 represents another transverse sectional view, similar to that shown in Fig. 9, to illustrate the elements in a different position, or in the position for effecting movement of the radiator tube.

Fig. 12 is a fragmentary top plan view showing the Geneva movement device with the elements engaged as shown in Fig. 11.

Fig. 13 represents a fragmentary sectional view disclosing the drive means between the power source and the carriage feed means.

Fig. 14 represents a fragmentary side elevational view of a radiator tube with a portion of the fin strip wound thereon.

Fig. 15 represents a sectional view taken substantially on the line 15—15 of Fig. 14.

Fig. 16 represents a top plan view of the radiator structure showing the fin strip wound on a radiator tube.

Fig. 17 represents a fragmentary perspective view of a fin strip partly formed.

Fig. 18 represents a fragmentary side elevational view of the fin strip enlarged to show the cut-out to be made by the punching device.

Referring to the drawings wherein like numerals designate like parts, it can be seen that Figs. 14 to 18 inclusive clearly show the type and construction of the radiator which this machine is adapted to produce.

By referring to Fig. 17, and starting at the left end of the illustration, it can be seen that numeral 5 represents the strip prior to the operation of forming or punching the same. Fig. 2 shows a roll 85 on which this strip is wound and from which it is paid to the punching device. This punching device which can be of conventional construction is briefly described and disclosed in Fig. 2 and generally referred to by numeral 6. This punching and forming device 6, first forms the flange 6′ along one longitudinal edge of the strip 5 and simultaneously forms the T-shaped slot 7, dividing the strip into sections 8 and simultaneously forming the flanges 9 which are disposed laterally from the same side of the strip 5. It can be plainly seen in Figs. 14, 15 and 16, that the flange 6′ engages the radiator tube 10 and is at the head of each slot 7 for engagement over the corresponding edge portion of the tube 10, while the flanges 8 abut each other in the manner shown in Figs. 14 and 16 to provide substantially closed passageways 11 between the sections 8 when the fin strip is properly assembled on the tube 10.

Now referring to the details of the machine, it can be seen that the machine includes a frame generally referred to by numeral 12, which includes the side rails 13—14, spaced by the spacing members 15. Figs. 1 and 3 show that the side rails 13 and 14 of the frame 12 are supported by the legs 16 at the ends and intermediate portions thereof.

Brackets 17—17 project from certain of the legs 16 (see Figs. 2 and 3) and have bearings 18 at their outer ends through which the shaft 19 is journalled. This shaft 19 carries the pulley 20 over which the drive belt 21 (see Fig. 3) is trained, and a sprocket wheel 22, over which the chain 23 is trained. It can also be seen in Fig. 2 that the Geneva movement of the device generally referred to by numeral 24 is associated with the shaft 19, and this will be taken up in detail hereinafter.

As can be clearly shown in Figs. 1 and 3, a second shaft 25 is journalled through bearings 26 on the arms 27 projecting from certain of the legs 16. As is clearly shown in Figs. 3, this shaft 25 carries a sprocket 28 over which the aforementioned chain 23 is trained, and at this point it can be seen that the shaft 25 is driven by the shaft 19 through this sprocket and chain drive.

The shaft 25 also carries a bevel gear 29 meshing with a bevel gear 30 located on the lower end of the shaft 31. This shaft 31 is journalled through a barrel 32 supported by the bracket 33 (see Fig. 3). The upper end of this shaft 31 is equipped with a bevel gear 34 which is meshable with either one of the two connected bevel gears 35—36, splined to the shaft 37 as at 38 (see Fig. 13).

As is clearly shown in Figs. 2 and 3, a hand lever 39 has one end pivotally connected as at 40 to the frame 12, with its intermediate portion operating within the limit yoke 41. This hand lever 39 is furthermore pivotally connected to the bevel gears 35—36 as at 42. (See Fig. 2.) At this point, it can be seen that the shaft 37 can be driven in either direction by shifting the gears 35—36 with respect to the gear 34.

This shaft 37 is journaled thru the bearings 43 located on the spacing members 15; and as is clearly shown in Fig. 2, a substantial portion of this shaft 37 is threaded as denoted by numeral 44.

The carriage for supporting the reel of fin stripping, the punch press and power plant, includes a slidable base plate 45 having laterally projecting members 46 thereon for rest upon the side members 13 and 14 of the frame 12, while detachable lugs 47 on the bottom side of the plate 45 engage with the side members 13 and 14 to prevent displacement of the plate 45. This plate 45 is provided with a depending boss 48 having a threaded bore therethrough for receiving the threaded portion 44 of the shaft 37.

The plate 45 is provided with a slot 49 therein over which the plate 50 is slidable, and a guard plate 51 overlapping the edge portion of the plate 45 at the opening 49 and against the bottom side thereof is connected to the plate 50 by the screw 52. This guard plate 51 has a depending boss 53 thereon through which is formed a threaded bore. The screw shaft 54 is journaled through one end portion of the plate 45 and is threaded through the boss 53, and is equipped with a crank handle 55′ at its outer end. Thus, by rotating the shaft 54, the plate 50 can be adjusted transversely of the plate 45 and by lifting the plate 50 adjustment of the press die 55 can be attained. The plate 50 is provided with upstanding flanges 56—57 (see Fig. 2), and through these flanges is journaled the shaft 58, equipped with the crank 59. The connecting rod 60 is interposed between the crank 59 and the die 55, while a clutch pulley 61 is located on one end of the shaft 58.

A motor 62 is located on the aforementioned plate 50, the armature shaft of which is provided with a pulley 63. A drive belt 64 is trained over the aforementioned pulleys 63 and 61.

The movable element 65 of the clutch pulley 61 has an arm 66 extending therefrom to connect to the rod 67 operative through the opening 68 in the plate 45. This connecting rod 67 pivotally connects at its lower end to the lever 69, while the lever 69 is pivotally connected as at 70 to a depending arm 71. (See Figs. 1 and 6.)

Having its ends journaled in bearings supported by certain legs 16 of the machine is the aforementioned shaft 25, which in addition to the gear 29 and sprocket 28 has the clutch operating frame 72 secured thereto. This is adapted to operate against the lever 69. At this point, it can be seen that the engagement of the frame against the lever 69 so as to operate the clutch 61 will intermittently operate the punch press generally referred to by numberal 6; and to insure that the radiator tube is stationary at the time the punch is made, the Geneva movement device referred to by numeral 24 is provided.

Another shaft 73 has its ends supported by certain of the legs 16 and adjacent each end thereof is a gear 74 for mesh with the corresponding gear 75 of the chuck numeral 76—77, the latter being constructed with a spring 78 so that the same can be retracted for replacement and displacement of the radiator tube 10 prior to and after the fin strip has been convoluted thereon.

As is clearly shown in Figs. 9 to 12 inclusive, the aforementioned Geneva movement device 24 is interposed between the shaft 19 and the shaft 73 so as to impart intermittent motion to the chuck mandrels resulting in the complete stopping of the radi-

ator tube, while the operation of punching the fin strip is in progress.

This Geneva movement device is made up of a disk 79 on the shaft 19, having a portion thereof cut out as at 80 to accommodate the indentured wheel 81 of the Geneva movement device when the pintle 82 on the free end of the arm 83 is engaging in one of the indentures 84 of the wheel 81. Obviously the wheel 81 and the shaft 73 are only disturbed when the arm 83 has its pin 82 engaged with the wheel in the manner substantially shown in Figs. 11 and 12.

Although the shaft 19 is always rotating, the shaft 73 is stationary when the arm 83 is in the position away from the wheel 81 as shown in Fig. 9.

By referring to Fig. 2, it can be seen that numeral 85 represents the reel on which the strip 5 is wound and from which the same is paid through the punch press 6.

It can now be seen that when the belt 21 (see Fig. 3) is in operation, power is transmitted through the chain 23 to the shaft 25 to rotate the clutch operating frame 72 and to simultaneously operate the shaft 37, through the gear transmission which includes the gears 34, 35 and 36. The shaft 37 can be rotated in one direction or the other by reversing the gears 35 and 36. This is of course accomplished by the hand lever 39. The shaft 19 through the Geneva movement 24 imparts intermittent motion to the chuck mandrels 76 and 77, so that when the tube 10 is being rotated, no power is being transmitted to the punch press 6 as the clutch pulley 61 is disengaged from the shaft 58 (see Fig. 2). When the Geneva movement device reaches a predetermined position, the punching mechanism will be released for operation, while the feed means remains stationary.

The shaft 37 in operation feeds the carriage supporting the punch press, motor and fin strip reel so that the formed fin strip will be properely convoluted on the radiator tube 10.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having thus described my invention, what I claim as new is:—

1. A radiator tube fin winding machine comprising a rotary mount for a radiator tube, a slidable carriage, a fin blank reel on the carriage, a punch press on the carriage through which the fin blank is paid, and clutch means for the said punch press.

2. A radiator tube fin winding machine comprising a rotary mount for a radiator tube, a slidable carriage, a fin blank reel on the carriage, a punch press on the carriage through which the fin blank is paid, clutch means for the said punch press, and automatic means for operating the clutch at certain intervals.

3. A radiator tube fin winding machine comprising a rotary mount for a radiator tube, a slidable carriage, a fin blank reel on the carriage, a punch press on the carriage through which the fin blank is paid, clutch means for the said punch press, automatic means for operating the clutch at certain intervals, and means for maintaining the radiator tube mount stationary when the punch press is in operation.

4. A radiator tube fin winding machine comprising a rotary mount for a radiator tube, a slidable carriage, a fin blank reel on the carriage, a punch press on the carriage through which the fin blank is paid, clutch means for the said punch press, and means for feeding the said carriage.

5. A radiator tube fin winding machine comprising a rotary mount for a radiator tube, a slidable carriage, a fin blank reel on the carriage, a punch press on the carriage through which the fin blank is paid, clutch means for the said punch press, means for feeding the said carriage, said means including reversing gears whereby the carriage can be driven in reversed directions.

6. A radiator fin winding machine comprising a rotary mount for supporting a radiator tube, a slidable carriage, a fin blank supply reel on the carriage, a punch press on the carriage interposed between the reel and the tube mount, clutch means for operating the punch press at certain spaced intervals, and means for rotating the tube mount when the punch press is inactive.

7. A radiator fin winding machine comprising a rotary mount for supporting a radiator tube, a slidable carriage, a fin blank supply reel on the carriage, a punch press on the carriage interposed between the reel and the tube mount, clutch means for operating the punch press at certain spaced intervals, means for rotating the tube mount when the punch press is inactive, including an eccentric movement device for intermittently operating the tube mount.

In testimony whereof I affix my signature.

JAMES E. GORTNER.