May 12, 1931. T. H. ROBERTS ET AL 1,805,261

MACHINE FOR MAKING SHELLS FOR AUTOMOBILE HEATERS AND THE LIKE

Filed Dec. 31, 1928 2 Sheets-Sheet 1

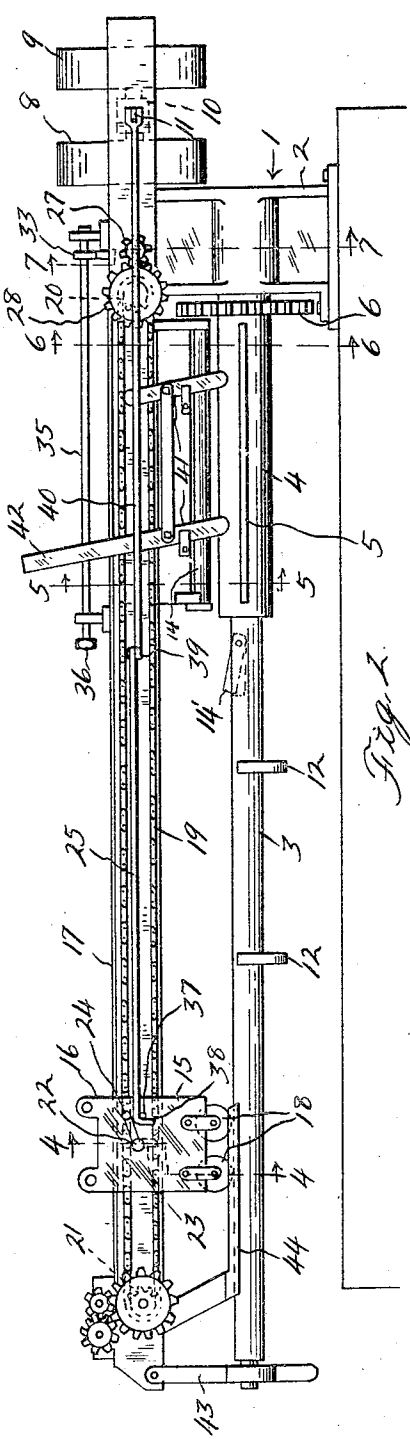

Fig. 1.

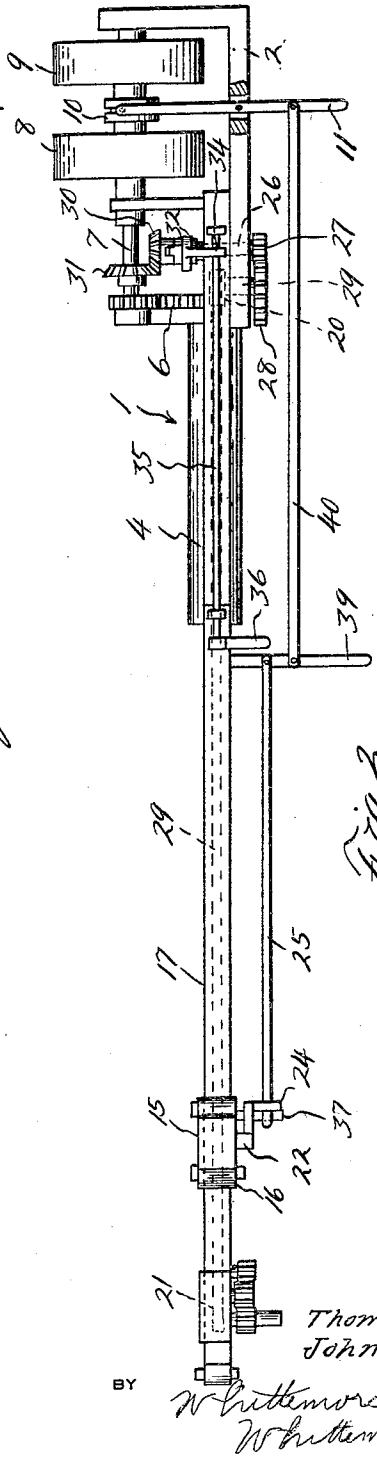

Fig. 2.

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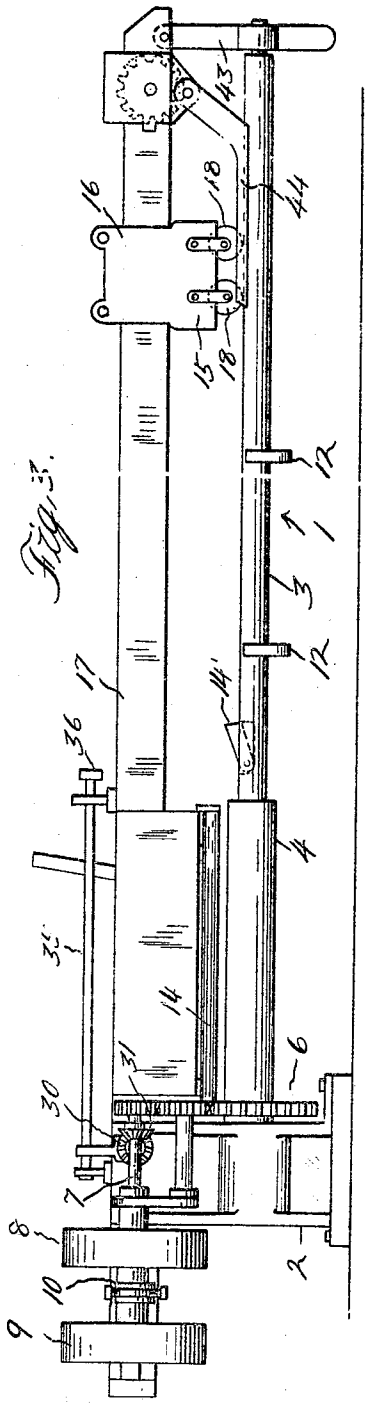

Fig. 7.

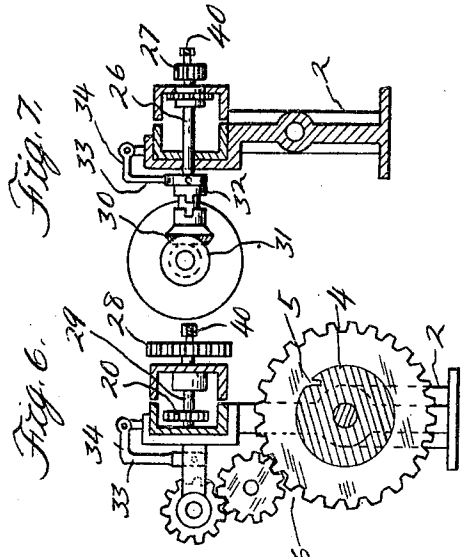

Fig. 6.

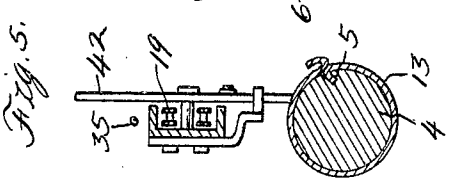

Fig. 5.

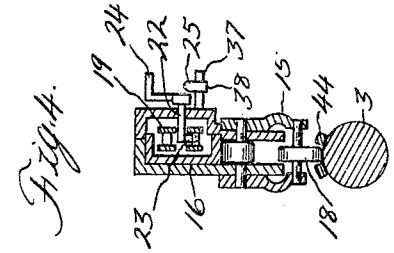

Fig. 4.

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UNITED STATES PATENT OFFICE

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MACHINE FOR MAKING SHELLS FOR AUTOMOBILE HEATERS AND THE LIKE

Application filed December 31, 1928. Serial No. 329,619.

This invention relates to machines for making shells for automobile heaters and the like and consists of certain novel features of construction, combinations and arrangements of parts as will be more fully described and particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a front elevation of a machine made in accordance with the present invention;

Figure 2 is a top plan view thereof;

Figure 3 is a rear elevation of the machine; and

Figures 4 to 7 are sections taken on lines 4—4, 5—5, 6—6, and 7—7 respectively of Figure 1.

Generally our invention comprises a machine for rolling and bending a sheet of material into the approximate form of the shell provided also with means for holding the sheet while locking ends of the sheet, said machine also being provided with means for supporting the sheet after it has been rolled so that a seaming tool may be moved over the ends of the sheet to form the finished shell.

Specifically the numeral 1 designates generally, our shell forming machine including a frame 2 and a longitudinally extending stationary shaft 3 supported upon said frame. Suitably journalled upon the inner end of the shaft 3 is a mandrel 4 provided with a longitudinally extending slot 5 terminating intermediate the ends thereof. For rotating the mandrel there is provided the reduction gearing 6 connecting the same to a shaft 7 upon which are loosely mounted drive pulleys 8 and 9 respectively. These pulleys are connected to the shaft 7 by means of the clutch 10 for driving the shaft in opposite directions. Preferably an operating handle 11 is pivotally mounted on the frame and is connected to the clutch for throwing the same into and out of operative engagement with one or the other of the pulleys.

Mounted on the shaft 3 at one side of the mandrel 4, are a pair of adjustably spaced positioning blocks 12 which are preferably rounded to conform to the curvature of the sheet of material after it has been rolled into the approximate form of the shell by means of the mandrel 4. Each sheet 13 before it is placed in the machine, preferably has its longitudinal edges crimped in the manner clearly shown in Figure 5. Before throwing in the clutch 10 to operate the mandrel, one of the crimped ends is first placed in the slot 5. This positions the sheet relative to the mandrel and prevents disengagement thereof during the rolling operation. Upon rotation of the mandrel, the sheet is rolled thereon and is guided in this movement by means of an adjustable guide roller 14. Each sheet is previously cut to such a size that one revolution of the mandrel will roll the same to the approximate size of the shell and when the sheet has reached the position shown in Figure 5, the mandrel is stopped and the crimped end portions of the rolled sheet are interlocked by means of a manual operation. The sheet is then removed from the mandrel and slipped over the positioning blocks 12 with the crimped end portions resting upon the top of the shaft 3. A pivoted stop member 14′ is mounted on the shaft and is adapted to be engaged by one end of the rolled sheet for correctly positioning the same longitudinally of the blocks.

With the sheet thus positioned upon the shaft, a seaming tool 15 is adapted to be moved over the top thereof into direct engagement with the crimped end portions to apply pressure thereto and form a suitable seam. This tool comprises a carriage 16 slidably mounted upon a channel-shaped housing 17 which is spaced from and extends longitudinally of the shaft 3. Depending from the lower end of the carriage are a pair of pressure rollers 18 adapted to be moved over the end portions of each rolled sheet for applying pressure thereto in forming the seam.

For actuating the tool 15 there is mounted within the housing 17 a sprocket chain 19 supported between sprockets 20 and 21 respectively. Suitably journalled in the carriage 16 is a stub shaft 22 provided at its inner end with a lug 23 adapted to be moved into and out of engagement with the links

of the sprocket chain by means of a handle 24. This handle is connected to the outer end of the stub shaft 22 and is normally engageable with a rod 25 during the movement of the seaming tool upon the housing, the rod 25 functioning to retain the lug 23 in operative engagement with the sprocket chain. The lug 23 just referred to is designed to connect the carriage to the chain whereby as the latter is actuated, the carriage will be moved longitudinally of the shaft 3 to effect the seaming operation.

For actuating the chain 19 there is provided a shaft 26 having a pinion 27 meshing with a gear 28 which is in turn mounted on the sprocket shaft 29. Loosely mounted upon the opposite end of the shaft 26, is a bevel gear 30 meshing with a corresponding gear 31, the latter being rigidly mounted on the shaft 7. A clutch 32 is mounted on the shaft 26 and is adapted to throw the latter into and out of operative engagement with the shaft 7. This clutch has a yoke member 33 provided with an extension 34 rigidly secured to a rod 35, the latter being pivotally mounted upon the frame and provided with an operating handle 36.

After a sheet has been rolled upon the mandrel and is placed in position for the seaming operation, the handle 36 is actuated to connect the shaft 26 with the shaft 7. The handle 11 is then moved to throw the clutch 10 into engagement with the pulley 9 whereupon the shaft 26 will actuate the sprocket chain in a direction to move the seaming tool 15 to the right of the position shown in Figure 1 and into engagement with the ends of the rolled sheet. When the tool has fully travelled from one end of the sheet to the other, the handle 11 is then actuated to throw the clutch out of engagement with the pulley 9 and into engagement with the pulley 8, thus reversing the direction of rotation of the shaft 7 and likewise that of the shaft 26 and of the chain whereby the tool is again moved over the sheet in the opposite direction. It will be noted that the rod 25 is supported at its free end upon a pin 37 projecting outwardly from the carriage 16 and which slidably engages the rod as the seaming tool is moved along the housing. The extreme free end of the rod is provided with a downwardly extending flange 38 while the other end is pivotally connected to a cross rod 39 which in turn is connected to the lever 11 by means of the rod 40. It will thus be apparent that with the clutch 10 in engagement with the pulley 8, during the return movement of the tool, the pin 37 will eventually engage the flange 38 and effect a movement of the rod 25. This will also actuate the handle 11 and throw the clutch out of engagement with the pulley 8 and into its neutral position, thus shutting off the power from the shaft 7 and the chain 19. This arrangement thereby constitutes means for automatically stopping the return movement of the seaming tool after the same has moved out of engagement with one of the finished shells.

There is also provided means for facilitating the manual step of interlocking the crimped ends of the sheet after the rolling operation is completed. This means constitutes a pair of bars 41 pivotally mounted on the frame and adapted to have their lower end portions moved into and out of engagement with the sheet. By actuating the handle 42 just before the final movement of the mandrel, the ends of the bars will be moved into engagement with the sheet and will be directed into the open portion of the free crimped end of the sheet, thus retaining this end of the rolled sheet in engagement with the mandrel while the operator disengages the other crimped end from the slot 5 and slips the same over the first mentioned end. When this is accomplished the bars may be moved out of engagement with the sheet and the latter removed in the manner above described. The end of the shaft 3 is mounted in a supporting member 43, this member being pivotally mounted upon the outer end of the housing 17 in such a manner that the former may be swung clear of the end of the shaft permitting the same to drop down slightly and thereby allow the finished shell to be slipped off the end of the shaft. When this is accomplished, the member may again be moved back to the position shown in Figure 1 whereupon the crimped end of a new sheet of material may be slipped into the slot 5 and the forming operation again repeated. There is also provided a guiding track 44 for the rollers 18 when the seaming tool is in its inoperative position, this track being mounted on the housing 17 and merely resting upon the outer end of the shaft 3 so that the latter may be moved out of engagement with the track when the member 43 is swung about its pivot and thereby permit the completed shell to be slipped off of the shaft.

From the foregoing, it will be apparent that we have provided a novel form of machine whereby a sheet of material may be easily and quickly formed into a shell such as those used for automobile heaters or the like; furthermore, that the control means for effecting this operation is such that it can be easily actuated by a single operator.

What we claim as our invention is:

1. In a machine for making shells for automobile heaters, means including a mandrel for bending a sheet of material into the approximate form of the shell, a support for the mandrel having a portion projecting beyond one end of the mandrel for supporting the sheet after the bending operation, and means movable longitudinally of the supporting means for seaming the ends of the sheet to form the finished shell.

2. In a machine for making shells for automobile heaters, a mandrel upon which a sheet of material is adapted to be rolled into the approximate form of the shell, means for rotating the mandrel, a stationary support for the mandrel having a portion projecting beyond but in alignment with the mandrel for supporting the bent sheet after removal from the mandrel, and means movable longitudinally of the supporting means for seaming the ends of the sheet to form the finished shell.

3. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, and means for seaming the ends of the sheet to form the finished shell.

4. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, and means for seaming the ends of the sheet to form the finished shell, said means including a carriage movable longitudinally of said shaft and rollers carried by said carriage and engageable with the aforesaid ends of the sheet.

5. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, and means for seaming the ends of the sheet to form the finished shell, said means including a carriage supported upon the machine above said shaft and movable longitudinally thereof, and rollers depending from said carriage and movable over the aforesaid ends of the sheet.

6. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means for rotating said mandrel, means on said shaft for supporting the sheet after removal from said mandrel, a seaming tool movable longitudinally of said shaft for engaging the ends of the sheet, and means for actuating said tool.

7. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means for rotating said mandrel, means on said shaft for supporting the sheet after removal from said mandrel, a seaming tool movable longitudinally of said shaft for engaging the ends of the sheet, and means associated with said mandrel rotating means for actuating said tool.

8. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, a housing spaced from and extending substantially parallel to said shaft, a sprocket chain mounted in said housing, and a seaming tool associated with said chain and movable thereby longitudinally of said shaft into and out of engagement with the ends of the sheet.

9. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, a housing spaced from and extending substantially parallel to said shaft, a sprocket chain mounted in said housing, a seaming tool slidably mounted on said housing, and means connecting said tool to said chain whereby the former is moved into and out of engagement with the ends of the sheet.

10. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, a housing spaced from and extending substantially parallel to said shaft, a sprocket chain mounted in said housing, a seaming tool associated with said chain and movable thereby longitudinally of said shaft into and out of engagement with the ends of the sheet, and a common operating means for said mandrel and chain.

11. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, a housing spaced from and extending substantially parallel to said shaft, a sprocket chain mounted in said housing, a seaming tool slidably mounted on said housing, and means connecting said tool to said chain whereby the former is moved into and out of engagement with the ends of the sheet, said means including a stub shaft provided with a lug, and a handle upon the outer end of the shaft for moving the lug into and out of engagement with said chain.

12. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft, and provided with a longitudinally extending slot adapted to receive an end of a sheet of material, means for rotating said mandrel to effect a bending of the sheet into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, and means for seaming the ends of the sheet to form the finished shell.

13. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and provided with a longitudinally extending slot adapted to receive an end of a sheet of material, means for rotating said mandrel to effect a bending of the sheet into the approximate form of the shell, means for guiding and retaining the sheet upon the mandrel during the bending operation, means on said shaft for supporting the sheet after removal from said mandrel, and means for seaming the ends of the sheet to form the finished shell.

14. In a machine for making shells for automobile heaters, a stationary supporting shaft, a mandrel journalled upon said shaft and adapted to receive and bend a sheet of material into the approximate form of the shell, means on said shaft for supporting the sheet after removal from said mandrel, a housing spaced from and extending substantially parallel to said shaft, a seaming tool slidably mounted on said housing and movable longitudinally of said shaft into and out of engagement with the ends of the sheet, and a supporting member for the free end of said shaft pivotally mounted on said housing whereby the member may be swung clear of the shaft for permitting the removal of the finished shell.

15. In a machine for making shells for automobile heaters, means including a mandrel for bending a sheet of material into the approximate form of the shell, a support for the mandrel having means at one side and substantially in alignment with the bending means for supporting the sheet after the bending operation, and means movable longitudinally of the supporting means for pressing together portions of the bent sheet of material to form the finished shell.

16. In a machine for making shells for automobile heaters, means including a mandrel for bending a sheet of material into the approximate form of the shell, a support for the mandrel having a portion extending laterally from the bending means for supporting the sheet after the bending operation and permitting the sheet to be shifted from the bending means on to the supporting means without leaving the machine, and means associated with the supporting means for pressing portions of the bent sheet together to form the finished shell.

17. In a machine for making shells for automobile heaters, means including a rotary part for bending a sheet of material into the approximate form of the shell, a member supporting the rotary part and having means for supporting the sheet after the bending operation, a member substantially parallel to the member aforesaid, and means movable longitudinally of the last-mentioned member and having means for pressing together portions of the bent shell on the first-mentioned member to form the finished shell.

In testimony whereof I affix my signature.
JOHN R. HOLMES.

In testimony whereof I affix my signature.
THOMAS H. ROBERTS.