E. R. STASCH.

CORRUGATING MACHINE.

APPLICATION FILED SEPT. 5, 1908.

929,722. Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.

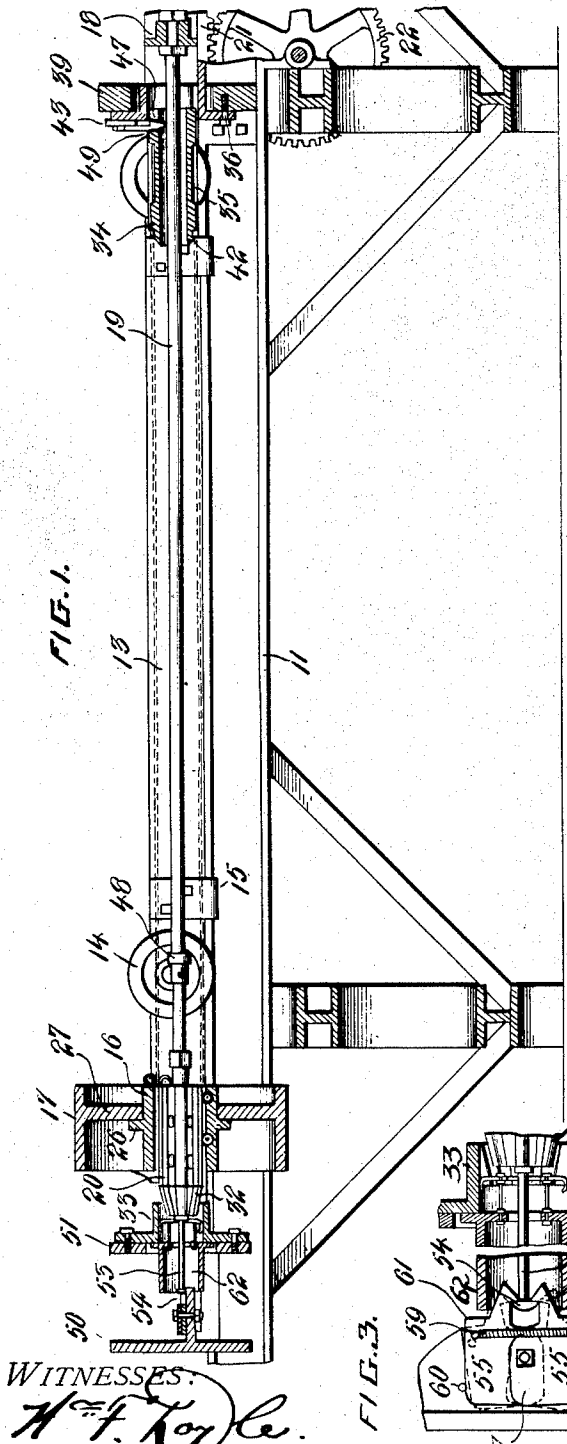

FIG. 1.

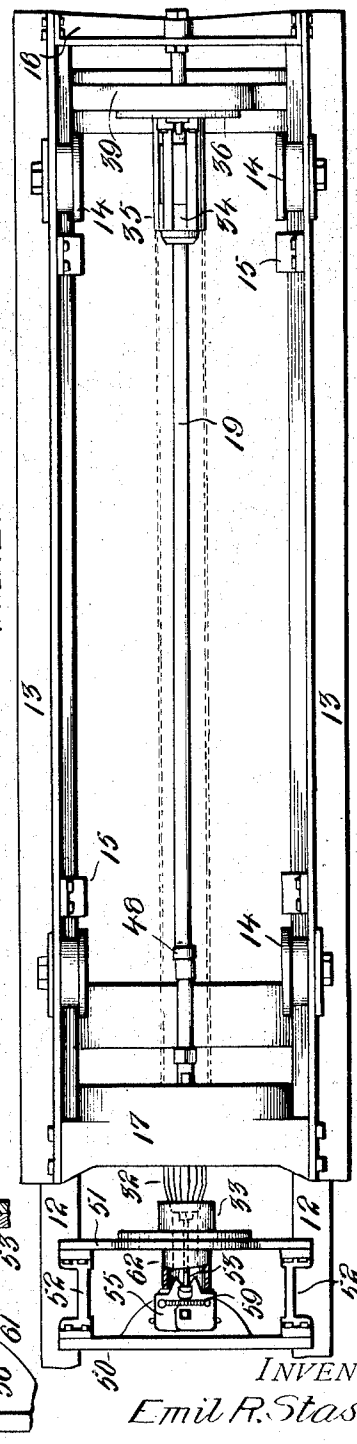

FIG. 2.

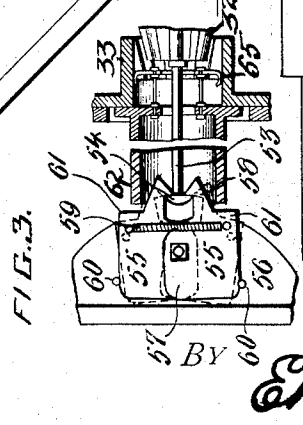

FIG. 3.

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2 SHEETS—SHEET 2.

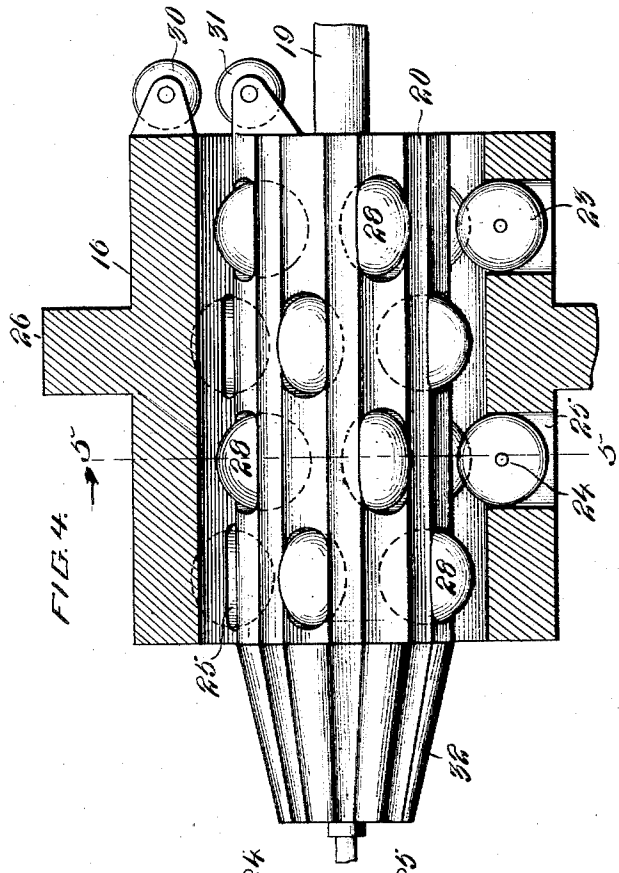

FIG. 4.

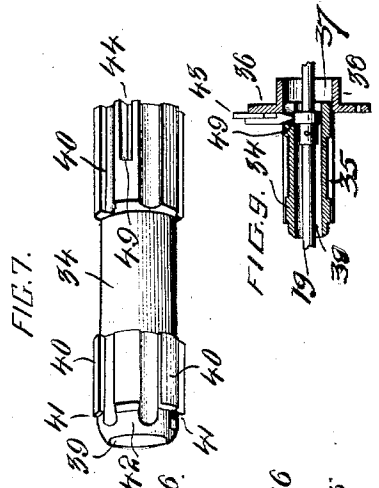

FIG. 7.

FIG. 9.

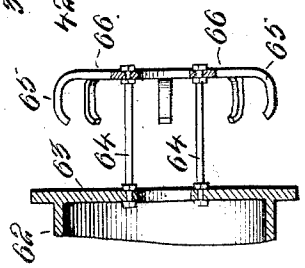

FIG. 10.

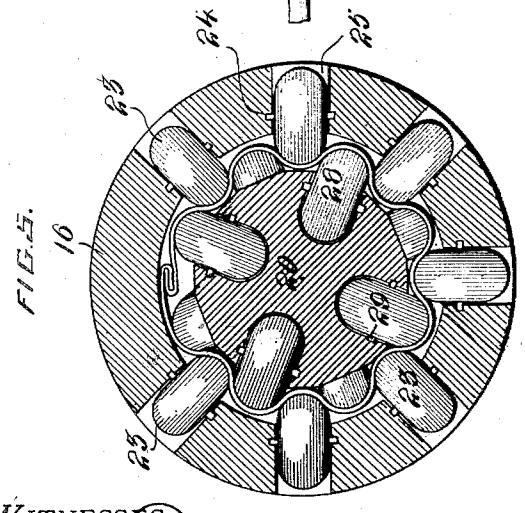

FIG. 5.

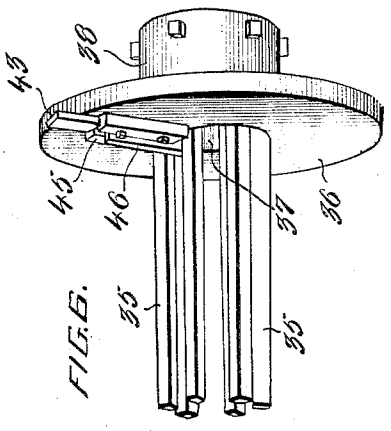

FIG. 6.

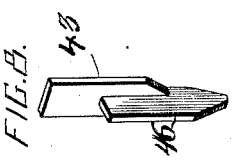

FIG. 8.

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UNITED STATES PATENT OFFICE.

EMIL R. STASCH, OF CORNING, NEW YORK.

CORRUGATING-MACHINE.

No. 929,722. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed September 5, 1908. Serial No. 451,776.

To all whom it may concern:

Be it known that I, EMIL R. STASCH, citizen of the United States, residing at Corning, county of Steuben, and State of New York, have invented certain new and useful Improvements in Corrugating-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a pipe corrugating machine, and particularly to a structure wherein the pipe is held relative to a movable corrugating head and mandrel.

The invention has for an object to provide a novel and improved construction of the pipe supporting collar and means for permitting a movement thereof to effect a corrugating action to the extreme end of the pipe supported thereby.

A further object of the invention is to provide a novel and improved construction and arrangement of the corrugating head and mandrel relative to the pipe supporting means by which the corrugating members may traverse the entire length of the pipe.

Another object of the invention is to provide a novel and improved construction of crimping head adapted to be automatically engaged with the movable corrugating members and disengaged therefrom in the continued movement of the members after completing its crimping action.

Other and further objects and advantages of the invention will be hereinafter fully set forth and the novel features thereof defined by the appended claims.

In the drawing:—Figure 1 is a longitudinal section through the machine; Fig. 2 is a top plan; Fig. 3 is an enlarged detail plan of the latch for the crimping head; Fig. 4 is an enlarged longitudinal section through the corrugating head and mandrel; Fig. 5 is a vertical section on line 5—5, Fig. 4; Fig. 6 is a detail perspective of the supporting arms for the pipe sleeve; Fig. 7 is a similar view of this sleeve; Fig. 8 is a detail perspective of the holding pin for this sleeve; Fig. 9 is a detail section showing this pin in raised position; Fig. 10 is a detail section of the operating head for releasing the latch of the crimping head.

Like numerals refer to like parts in the several views of the drawing.

The numeral 11 indicates the bed frame of the machine which may be of any desired character or dimensions suitable for the work to be performed. This is provided upon its upper face with slide ways 12 adapted to receive a carriage frame 13 which is provided with bearing rollers 14 to move longitudinally upon said ways, and is retained against vertical displacement by means of the keepers 15. This carriage is provided at one end with the corrugating head 16 supported by the cross frame 17 extended between the side members of the carriage. At the opposite end of the machine the side bars are connected by cross bar 18 to which a longitudinally extending rod 19 is secured and bears at its free end a mandrel member 20 disposed within the head 16. The carriage 13 may be reciprocated upon the frame by any desired means, for instance, a rack bar 21 carried thereby and meshing with a drive wheel 22 geared to any source of power.

The corrugating head 16 is provided with a series of corrugating rollers 23 in alinement and each series spaced from the other the desired width of the corrugations. The rollers are journaled at 24 in suitable recesses 25 formed in the head 16, as shown in Figs. 4 and 5. This head is supported in position by means of the peripheral flange 26 which abuts an interior rib 27 in the head 17. The mandrel 20 is provided with a coöperating series of rollers 28 pivotally mounted in recesses therein by means of pintles 29, these rollers being arranged in series to successively coöperate with the rollers 23 as shown in Fig. 5. At one portion of the mandrel and head the corrugating rollers are omitted and the seaming roller 30 is carried by the head at its inlet end and adapted to coöperate with a similar roller 31 mounted upon the mandrel so as to close the pipe seam in the entrance of the pipe into the head before action of the corrugating rollers thereon. This mandrel is provided at the discharge end of the head with the tapering crimping face 32 having corrugations or crimping surfaces formed thereon to coöperate with a crimping head 33 as will be hereinafter described.

For the purpose of supporting one end of the pipe during the movement of the corrugating means thereover a holding sleeve 34 is mounted at one end of the base frame and adapted to be movably supported by the fingers 35. These fingers are carried by the plate 36 having the aperture 37 therethrough for the passage of the mandrel rod 19 and this plate is formed with a holding collar 38 mounted in the cross frame 39 carried by the

base 11 of the machine frame so that the fingers are rigidly supported relative to the other parts. These fingers are spaced from each other, as shown in Fig. 6 and are adapted in the final corrugating at the end of the tube to enter between the head and mandrel for a sufficient distance to permit a completion of the corrugating action. The holding sleeve 34 is tubular being provided with a central opening 39 therethrough, and upon its outer periphery a series of lugs 40 are formed between which the fingers 35 are disposed thus holding the sleeve in proper alinement while the pipe is adapted to abut the ends 41 of these lugs next the corrugating members, and to be supported by a portion 42 of the sleeve extended beyond said lugs. This sleeve is normally held against longitudinal movement by means of the holding pin 43, as shown in Figs. 1 and 8, the inner end of which is adapted to enter an aperture 44 extending through the sleeve. This holding pin is slidably mounted on the plate 36 by means of the keepers 45 at opposite sides thereof and is formed with a guide rib 46 extending between said keepers. The lower end of the pin is tapered or inclined so that the pin moves by frictional engagement of any member contacting therewith. One means for this purpose is the collar 48 carried by the rod 19 which in the movement of the corrugating members engages the pin moving it upward until it reaches the face 49 at one end of the aperture 44 in the holding sleeve which continues the rising movement of the pin so as to release said sleeve allowing it to move longitudinally upon the supporting fingers and leaving only said fingers to temporarily engage the pipe during the final corrugating action.

The crimping head 33 is mounted upon the carriage 50 independent of the carriage 13 for the corrugating members and is likewise movable upon the ways 12 of the base frame. The head is supported by the cross bar 51 and is spaced in advance of the back plate of the carriage by side members 52. This crimping head is provided with interior corrugations coöperating with those upon the face of the mandrel, and beyond the end of the mandrel a rod 53 is extended and provided with a head 54 by which the crimping head may be connected temporarily to the mandrel member. This latch head is adapted to coöperate with the pivoted latch members 55 mounted on the plate 56 of the carriage by means of the pivot 57, said members being provided with latch jaws 58 to engage the head 54, and these jaws are normally held in contact with each other by means of a connecting spring 59, while their movement is limited by stops 60 disposed at opposite sides thereof, as shown in Fig. 3. Each of the jaws is provided with a contact face 61 by which they may be opened automatically by the longitudinal pressure of the pipe within the crimping members. This may be effected by any desired connection, one of which is herein shown and comprises the movable member 62 adapted to engage the face 61 and thus separate the latch jaws releasing the crimping head carriage from the driving carriage of the corrugating means. This releasing member 62 is shown in detail in Fig. 10 wherein the flange 63 thereof is adapted to support the rods 64 extending within the crimping head and provided with rearwardly curved fingers 65 riding between said corrugations. The face 66 of these fingers is adapted to engage the end of the pipe during the crimping action which forces the releasing member 62 back into engagement with the faces 61 of the latch causing the same to be opened.

In the operation of the machine, the sheet to be formed into a pipe is provided with the usual lock seam bend at its opposite side edges and is passed around the mandrel rod with the parts in the position shown in Figs. 1 and 2. The seams are then engaged and placed in alinement with the seaming rollers on the mandrel and head, while the opposite end of the pipe rests upon the holding sleeve and abuts the lugs thereon, and fingers, as shown by dotted lines in said figures, thus supporting the pipe in proper position for operation. At this time the crimping head is connected to the corrugating carriage by the latch members and in the movement of the corrugating head and mandrel the seam of the pipe is first closed and the corrugating action thereof then continues by engagement with the successive rollers until the corrugated end of the pipe extends beyond the corrugating head when it enters the crimping head and is forced between that member and the tapering crimping face of the mandrel. This crimping movement or action continues until the end of the pipe moves the releasing member into contact with the latch which opens and releases the corrugating carriage from the crimping carriage allowing the latter to stand at rest in the position where dropped. The corrugating action continues throughout the length of the pipe until the collar upon the mandrel rod reaches and shifts upward the holding pin for the pipe retaining sleeve releasing the sleeve for movement longitudinally when contacted by the corrugating members leaving only the supporting fingers at that end of the pipe and permitting the passage of the corrugating members to the extreme end of the pipe which may then be removed from the machine having corrugations throughout its entire length with one end thereof crimped or tapered so as to fit a joining pipe section. In the return movement of the corrugating members the rod carried by the mandrel engages the latch of the crimping carriage

which is standing at rest on the ways and connects this part with the corrugating carriage so that both move in unison to their initial position. The supporting sleeve may then be moved in position to support another pipe and in such movement the holding pin thereof drops into the position shown in Fig. 1 retaining the sleeve against movement until subsequently released by the corrugating members just described. These corrugating members have been shown as constructed and arranged for corrugating a round pipe, but may be arranged for the production of a pipe of any desired cross section and corrugating the same to any preferred extent. The invention therefore presents a simple, efficient and economically constructed form of corrugating machine adapted to completely corrugate the pipe sections and to automatically crimp the ends thereof performing these two steps in a single operation of the corrugating devices.

Having described my invention and set forth its merits, what I claim and desire to secure by Letters Patent is:—

1. In a corrugating machine, movable corrugating members, a plate having relatively fixed fingers extending therefrom, a pipe supporting sleeve mounted to travel relative to said fingers, and means carried by the corrugating members for releasing said sleeve for longitudinal movement thereof.

2. In a corrugating machine, movable corrugating members, a plate having relatively fixed fingers extending therefrom, a pipe supporting sleeve mounted to travel relative to said fingers, a holding pin contacting with said sleeve, and means carried by the corrugating members for releasing said pin.

3. In a corrugating machine, movable corrugating members, a plate having relatively fixed fingers extending therefrom, a pipe supporting sleeve mounted to travel relative to said fingers, a holding pin contacting with said sleeve, a mandrel rod extending through said sleeve, and an actuating collar thereon adapted to engage and release said pin.

4. In a corrugating machine, the combination with a movable corrugating head and mandrel, a plate having spaced supporting fingers extending therefrom, a sleeve slidable relative to said fingers and provided with an aperture therethrough, a slidable holding pin mounted upon said plate and extending through said sleeve, and means carried by said mandrel for moving said pin into the path thereof.

5. In a corrugating machine, the combination with a movable corrugating head and mandrel, of a plate having spaced supporting fingers extending therefrom, a sleeve slidable relative to said fingers and provided with an aperture therethrough, a slidable holding pin mounted upon said plate and extending through said sleeve, an inclined lower end to said pin, and a contacting member adapted to traverse said sleeve and vertically raise said pin to release the sleeve for longitudinal movement upon the fingers.

6. In a corrugating machine, the combination with a movable head and mandrel, of a plate carrying supporting fingers, a tubular sleeve having lugs intermediate of said fingers and a pipe supporting portion at one end thereof, and means for permitting longitudinal movement of said sleeve relative to said fingers.

7. In a corrugating machine, the combination with movable head and mandrel, of a plate carrying supporting fingers, a tubular sleeve having lugs intermediate of said fingers and a pipe supporting portion at one end thereof, means for permitting longitudinal movement of said sleeve relative to said fingers, and a sliding bolt mounted in ways upon said plate and adapted to extend through an aperture in said sleeve.

8. In a corrugating machine, the combination with a movable head and mandrel, of a plate carrying supporting fingers, a tubular sleeve having lugs intermediate of said fingers and a pipe supporting portion at each end thereof, means for permitting longitudinal movement of said sleeve relative to said fingers, a sliding bolt mounted in ways upon said plate and adapted to extend through an aperture in said sleeve, a beveled operating face upon the lower end of said bolt, and means adapted to traverse said sleeve and contact with said face.

9. In a corrugating machine, the combination with movable corrugating members, of a crimping head constructed and arranged to be automatically engaged and disengaged from said members.

10. In a corrugating machine, the combination with movable corrugating members, of an extension from one of said members, and a crimping head having means to engage said extension.

11. In a corrugating machine, the combination with movable corrugating members, of an extension from one of said members, a crimping head having means to engage said extension, and means actuated by a pipe for releasing said engaging means.

12. In a corrugating machine, the combination with movable corrugating members, of an extension from one of said members, a crimping head having means to engage said extension, and a sliding member carried by said crimping head and having a contact surface to contact and release said engaging means.

13. In a corrugating machine, the combination with movable corrugating members, of a rod extending from one thereof and provided with a head, a crimping head having a latch adapted to automatically engage

said head, and means for releasing said latch during the corrugating action of said members.

14. In a corrugating machine, the combination with movable corrugating members, of a rod extending from one thereof and provided with a head, a latch adapted to automatically engage said head, a sliding member mounted in said head and having contacting faces to engage a pipe therein, and a coöperating face upon said latch adapted to be engaged by said member for releasing the latch.

15. In a corrugating machine, the combination of movable corrugating members one of which is provided with a headed extension, of a crimping head having a latch comprising opposite pivoted members having releasing faces, and means carried by said head for releasing said latch.

16. In a corrugating machine, the combination with movable corrugating members one of which is provided with a headed extension, of a crimping head having a latch comprising opposite pivoted members having releasing faces, a spring connecting the members of said latch to normally draw them in contact with each other, and a stop pin to limit the movement of said members.

17. In a corrugating machine, the combination with movable corrugating members one of which is provided with a headed extension, of a crimping head having a latch comprising opposite pivoted members having releasing faces, a spring connecting the members of said latch to normally draw them in contact with each other, a tubular member embracing a portion of said latch and adapted to contact with the releasing faces thereof, and fingers disposed in the crimping head and connected to said tubular member for reciprocation thereof.

18. In a corrugating machine, the combination with movable corrugating members, a crimping face extending beyond one of said members, and a crimping head coöperating with said face.

19. In a corrugating machine, the combination with movable corrugating members, of a crimping face extending beyond one of said members, a crimping head coöperating with said face, and means for disconnecting said crimping head in the movement of said corrugating members.

20. In a corrugating machine, the combination with movable corrugating members, of a crimping face extending beyond one of said members, a crimping head carried by one of said members and coöperating with said face, and means actuated by the longitudinal pressure of a pipe for automatically disconnecting said crimping head in the movement of the corrugating members.

21. In a corrugating machine, a corrugating head, a coöperating mandrel disposed in said head and provided with a tapering crimping face, a coöperating crimping head mounted upon a movable carriage, and means for connecting said mandrel and crimping head.

22. In a corrugating machine, a corrugating head, a coöperating mandrel disposed in said head and provided with a tapering crimping face, a coöperating crimping head mounted upon a movable carriage, a rod extending from said mandrel, a latch carried by the crimping head engaging said rod, and means carried by the crimping head for automatically releasing it from the mandrel in the movement thereof.

23. In a corrugating machine, a corrugating head, a coöperating mandrel disposed in said head and provided with a tapering crimping face, a coöperating crimping head mounted upon a movable carriage, a rod extending from said mandrel, a latch carried by the crimping head engaging said rod, means carried by the crimping head for automatically releasing it from the mandrel in the movement thereof, and seaming rollers carried by said head and mandrel at the opposite side of the corrugating head from the crimping head.

24. In a corrugating machine, a corrugating head, a coöperating mandrel disposed in said head and provided with a tapering crimping face, a coöperating crimping head mounted upon a movable carriage, a rod extending from said mandrel, a latch carried by the crimping head engaging said rod, means carried by the crimping head for automatically releasing it from the mandrel in the movement thereof, seaming rollers carried by said head and mandrel at the opposite side of the corrugating head from the crimping head, and supporting means for the opposite end of a pipe adapted to be automatically released for longitudinal movement in the travel of the mandrel toward the supporting means.

25. In a corrugating machine, a movable corrugating head and mandrel therein, crimping means adapted to coöperate with the face of said mandrel and movable therewith for a portion of its travel, supporting means for the opposite end of a pipe mounted for movement from said pipe end, and means carried by one of the corrugating members for automatically releasing said supporting means in their approach thereto.

26. In a corrugating machine, a movable corrugating head and mandrel therein, crimping means adapted to coöperate with the face of said mandrel and movable therewith for a portion of its travel, supporting means for the opposite end of a pipe mounted for movement from said pipe end, means carried by one of the corrugating members for automatically releasing said supporting means in their approach thereto, and means for auto-

matically releasing said crimping means from the corrugating members in their movement toward the supporting means.

27. In a corrugating machine, a movable corrugating head and mandrel therein, crimping means adapted to coöperate with the face of said mandrel and movable therewith for a portion of its travel, supporting means for the opposite end of a pipe mounted for movement from said pipe end, means carried by the mandrel member for automatically releasing said supporting means in their approach thereto, means for automatically releasing said crimping means from the corrugating members in their movement toward the supporting means, and means for automatically reconnecting the crimping means in the movement of the corrugating members toward the same.

28. In a corrugating machine, the combination with a cylindrical corrugating head provided with a plurality of longitudinally disposed corrugating rollers in alinement with each other and located therein in different transverse planes, of a relatively fixed mandrel disposed within said head and having coöperating series of rollers disposed in different transverse and longitudinal planes, and seaming rollers carried by said mandrel and head at one end thereof in a plane beyond said corrugating rollers.

29. In a corrugating machine, the combination with a tubular corrugating head provided with corrugating roller therein, of a mandrel disposed with said head and having coöperating rollers, seaming rollers carried by said mandrel and head at one end thereof, and a tapering crimping face carried by said mandrel at the opposite end of said head.

30. In a corrugating machine, the combination with a tubular corrugating head provided with corrugating rollers therein, of a mandrel disposed within said head and having coöperating rollers, a tapering crimping face carried by said mandrel at the opposite end of said head, and a tubular crimping head having corrugations coöperating with those of the crimping face of the mandrel.

31. In a corrugating machine, a base frame, a carriage mounted thereon provided with a corrugating head at one end and a cross bar at the opposite end, a mandrel rod extending from said bar, a mandrel disposed within said head, and a fixed pipe support upon the base frame surrounding said mandrel intermediate of the sides of said carriage.

32. In a corrugating machine, a base frame, a carriage mounted thereon provided with a corrugating head at one end and a cross bar at the opposite end, a mandrel rod extending from said bar, a mandrel disposed thereon within said head, a fixed pipe support upon said base, a crimping head carriage movable upon said base, and means for connecting and disconnecting said crimping head carriage from the corrugating carriage.

33. In a corrugating machine, a base frame, a carriage mounted thereon provided with a corrugating head at one end and a cross bar at the opposite end, a mandrel rod extending from said bar, a mandrel disposed thereon within said head, a fixed pipe support upon said base, a crimping head carriage movable upon said base, and means for automatically connecting and disconnecting said crimping carriage from the corrugating carriage.

34. In a corrugating machine, a base frame, a carriage mounted thereon provided with a corrugating head at one end and a cross bar at the opposite end, a mandrel rod extending from said bar, a mandrel disposed thereon within said head, a fixed pipe support upon said head, a crimping head carriage movable upon said base, means for automatically connecting and disconnecting said crimping carriage from the corrugating carriage, and means for automatically releasing said pipe support in the movement of the corrugating means toward the support.

35. In a corrugating machine, a base frame, a carriage movable thereon provided with a corrugating head at one end and a cross bar at the opposite end, a mandrel rod extending from said bar, a mandrel disposed within said head, a fixed pipe support upon said head, a crimping head carriage movable upon said base, means for automatically connecting and disconnecting said crimping carriage from the corrugating carriage, and means for automatically releasing said pipe support for movement after the disconnection of the crimping head carriage from the corrugating carriage.

36. In a corrugating machine, the combination with a cylindrical corrugating head provided with a plurality of longitudinally disposed corrugating rollers in alinement with each other and located therein in different transverse planes, of a relatively fixed mandrel disposed in said head and having coöperating series of rollers in different transverse and longitudinal planes.

In testimony whereof I affix my signature in presence of two witnesses.

EMIL R. STASCH.

Witnesses:
LENA BARBER,
FRANK H. FERRIS.