No. 690,353. Patented Dec. 31, 1901.

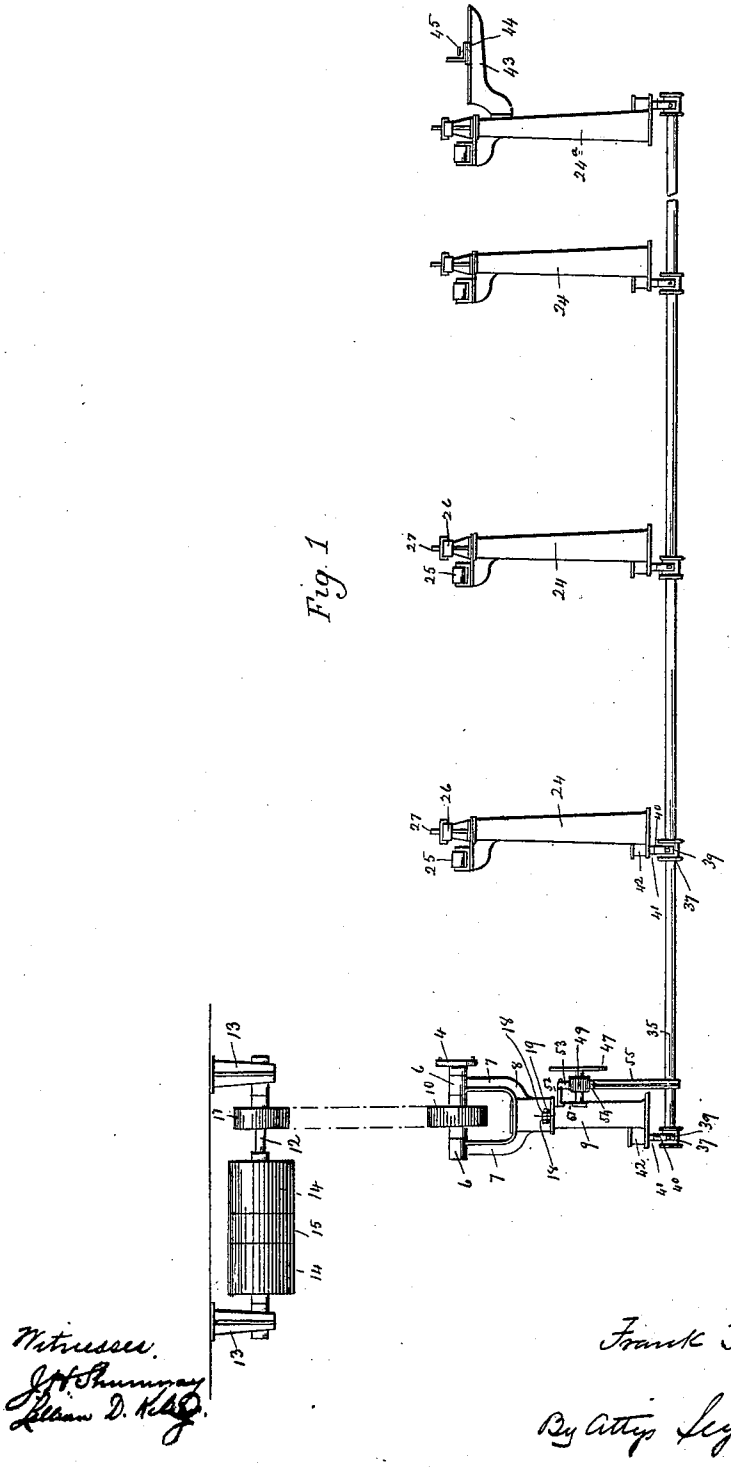
F. H. BREWSTER.

MACHINE FOR CROSS WRAPPING RUBBER HOSE PREPARATORY TO VULCANIZATION.

(Application filed July 22, 1901.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1



Witnesses.
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By Atty's Seymour & Earle

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(No Model.) 4 Sheets—Sheet 2.

Fig. 3

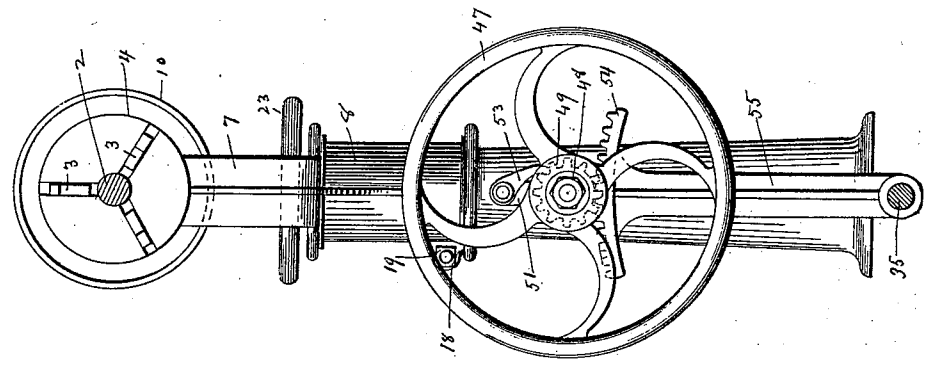
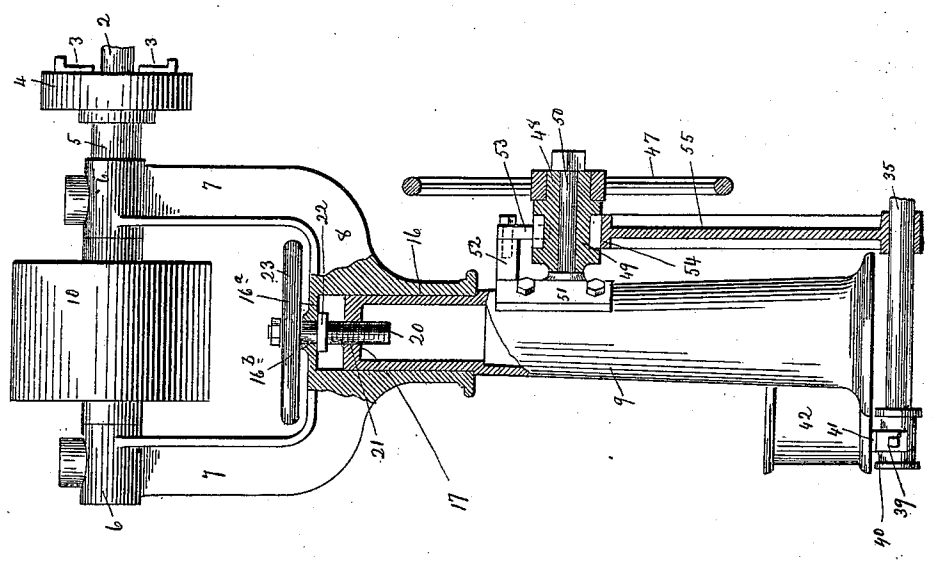


Fig. 2



Witnesses.
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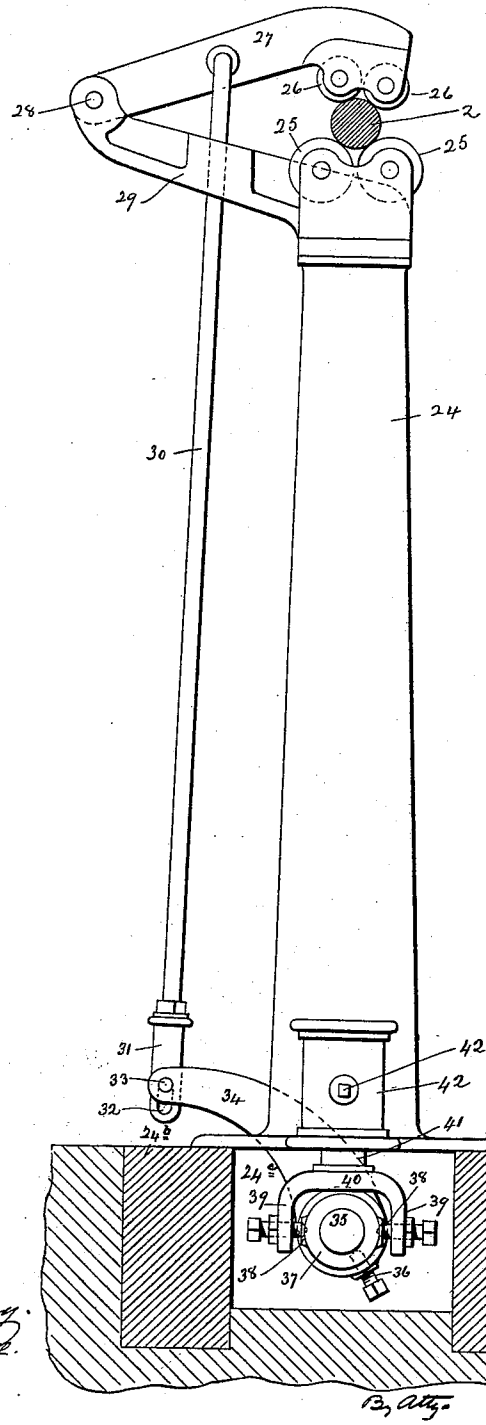
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(Application filed July 22, 1901.)

(No Model.) 4 Sheets—Sheet 3.

Fig 4



Witnesses.
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No. 690,353. Patented Dec. 31, 1901.

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MACHINE FOR CROSS WRAPPING RUBBER HOSE PREPARATORY TO VULCANIZATION.

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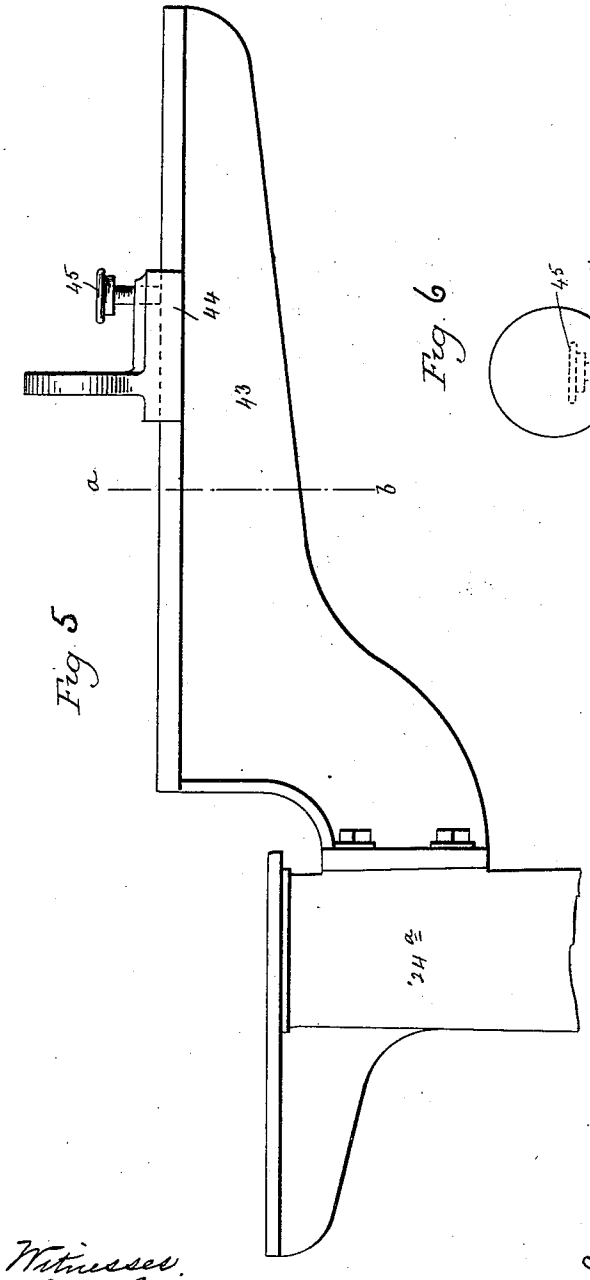


Fig. 5

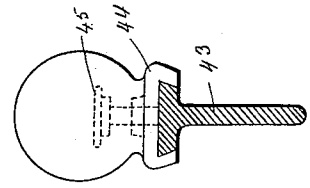


Fig. 6

Witnesses.
J. F. Dunnegan.
Lillian D. Kelsey.

Frank H. Brewster.
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By attys Seymour & Earle

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UNITED STATES PATENT OFFICE.

FRANK H. BREWSTER, OF DERBY, CONNECTICUT, ASSIGNOR TO BIRMINGHAM IRON FOUNDRY, OF DERBY, CONNECTICUT, A CORPORATION.

MACHINE FOR CROSS-WRAPPING RUBBER HOSE PREPARATORY TO VULCANIZATION.

SPECIFICATION forming part of Letters Patent No. 690,353, dated December 31, 1901.

Application filed July 22, 1901. Serial No. 69,211. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. BREWSTER, of Derby, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Machines for Cross-Wrapping Rubber Hose Preparatory to Vulcanization; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in front elevation of a machine constructed in accordance with my invention; Fig. 2, a view, partly in vertical section and partly in front elevation, of the driving-end stand; Fig. 3, a view thereof in inside elevation; Fig. 4, a view in inside elevation of one of the mandrel-supporting stands; Fig. 5, a broken view of the rear-end stand, showing the bracket with which it is provided; Fig. 6, a sectional view on the line *a b* of Fig. 5.

My invention relates to an improvement in machines for cross-wrapping rubber hose preparatory to vulcanization, the object being to provide effective means for holding the mandrel in place during the process of cross-wrapping and to provide for the adjustment of the mandrel with reference to its supports, so as to accommodate the machine to hose of different diameter.

With these ends in view my invention consists in the construction and combination of parts to be hereinafter described, and particularly pointed out in the claims.

In carrying out my invention as herein shown I employ an ordinary mandrel 2, the butt-end of which is gripped by the jaws 3 of a universal chuck 4, secured to a driving-shaft 5, mounted in suitable bearings 6, located at the upper ends of the two arms 7 of a vertically-adjustable head 8, mounted upon the front or driving end stand or post 9. The said driving-shaft 5 is provided with a driving-pulley 10, receiving a belt running over it from a pulley 11, mounted upon a countershaft 12, suspended from the ceiling in hangers 13 and also carrying two loose pulleys 14 and a fixed pulley 15, having about one-half the width of either of the pulleys 14. The said loose pulleys 14 receive belts running in opposite directions, as usual.

To provide for the vertical adjustment of the head 8, it is formed at its lower end with a socket 16, adapting it to be set over and moved up and down upon the upper end of the stand or post 9, the said upper end of the stand or post 9 being closed by a diaphragm 17 and corresponding in cross-section to the cross-section of the socket 16. If the socket and the upper end of the stand or post are round in cross-section, a feather will be necessary to prevent the head 8 from swiveling upon the stand or post 9; but if they are of irregular form in cross-section, such as square or polygonal, a feather will not be required. The socketed lower end of the head 8 is split vertically and provided with two clamping-lugs 18 for the reception of a clamping-bolt 19, whereby the socket is clamped upon the upper end of the stand or post 9 in any desired position of vertical adjustment thereupon. For the vertical adjustment of the head I employ a heavy screw 20, passing through a threaded opening 21, formed in the center of the diaphragm 17, before mentioned. This screw is mounted in the head 8 so as to swivel therein. For this purpose the screw is provided with a collar 22, which acts in opposition to the hub of a hand-wheel 23, rigidly attached to the upper end of the screw, and prevents the screw from moving longitudinally with respect to the head 8, so that when the hand-wheel is turned the screw will move up or down with respect to the post or stand 9 and so effect the vertical adjustment of the head 8, and hence of the chuck 4, which may thus be raised or lowered with respect to the level of the floor of the room containing the machine, as will be explained hereinafter. The upper end of the socket 16 is closed by a diaphragm 16^a, having a central opening 16^b, through which the screw 20 passes. This diaphragm rests upon the collar 22 and supports the hub of the said hand-wheel 23.

For supporting the mandrel 2 throughout

its length I employ a series of mandrel-supporting stands or posts 24, of which I have shown three; but this number will be varied according to the length of the mandrel employed. These stands 24 correspond to each other, and each is provided at its upper end with two mandrel-supporting rolls 25, upon which the mandrel 2 rests and upon which it is retained by the use of two somewhat smaller mandrel-retaining rolls 26, mounted in the outer end of a vertically-movable pivotal arm 27, the opposite end of which is secured by a pivot 28 to the end of a bracket-arm 29, extending rearwardly from the upper end of the stand or post 24. The rolls 26, it will be observed, are located directly above the rolls 25.

For the purpose of raising and lowering the mandrel-retaining rolls 26 with respect to the mandrel I employ a series of controlling-rods 30, having their upper ends attached to the arms 27, their lower ends being threaded into heads 31, the lower ends of which are formed with slots 32 for the reception of pins 33, mounted in the ends of rearwardly-extending rock-arms 34, secured to a rock-shaft 35, extending throughout the length of the machine. The said arms 34 are secured to the shaft 35 by means of set-screws 36, which enable the arms to be set upon the shaft in the right relation thereto. The rock-shaft 35 is mounted in boxes 37, swinging upon centers 38, mounted in the arms 39 of yokes 40, the stems 41 of which are entered into laterally-projecting hubs 42, formed integral with the lower ends of the stands 24 and secured in any desired position of vertical adjustment therein by means of screws 42^a.

When the shaft 35 is rocked in one direction, it will operate through the rods 30 to simultaneously lift the arms 27, so as to clear their rolls 26 from the mandrel. On the other hand, when the shaft is rocked in the opposite direction the rolls 26 will settle down upon the mandrel, upon which they will be held by gravity and in some instances in addition thereto by the downward draft of the rock-arms 34 under the action of the rock-shaft 35, at which time the pins 33 will pull against the lower ends of the slots 32 in the heads 31.

The rear-end stand 24^a corresponds to the stands 24 in every other respect than that of being provided with a T-shaped bracket-arm 43, located in line with the mandrel and provided with a slide 44, adapted to move in line with the mandrel and to be fixed in any of its positions by a set-screw 45. In using the machine the mandrel has its butt-end clamped in the universal chuck 4, after which the slide 44 is moved up against the rear end of the mandrel to prevent it from having any longitudinal play.

The rock-shaft 35 is rocked back and forth by means of a hand-wheel 47, mounted upon the hub 48 of a pinion 49, which turns upon a short stud 50, fastened to a bracket 51, bolted to the driving-end stand or post 9 and formed at its upper end with an arm 52, carrying a locking-pawl 53, which engages with the leaves of the pinion 49, which meshes into a segmental rack 54, located at the upper end of a rock-arm 55, rigidly secured at its lower end to the shaft 35. When the hand-wheel 47 is turned, the rock-shaft 35 will be rocked one way or the other for lifting the mandrel-retaining rollers 26 above the mandrel or for letting them down thereupon for holding the same firmly in place upon the mandrel-supporting rolls 25. As the hand-wheel is turned and the pinion 49 rotated the pawl 53 will drop between its teeth and lock it, whereby the shaft 35 will be locked. In long machines it may be found desirable to duplicate this mechanism at the rear end of the shaft.

It will be understood that by vertically moving the head 8 the center of the universal chuck 4 may be raised and lowered with respect to the rolls 25 in the stands 24 and 24^a, these stands not being adjustable so far as the mandrel-supporting rolls 25 are concerned; but by raising and lowering the head 8 different sizes of mandrels may be used, and therefore different sizes of hose prepared for vulcanization.

The rock-shaft 35, which extends throughout the length of the machine, is located below the level of the floor of the room in which the machine is placed. This is a matter of great convenience, as it enables the workman to pass freely between the stands 24 and 24^a in carrying the long mandrels, whether for placing them in the machine or removing them therefrom. As shown in Fig. 3 of the drawings, the stand 24 rests upon two heavy beams 24^b, between which is formed a space 24^c, containing the yokes 40, in which the rock-shaft 35 is supported. I should mention that the driving-end stand 9 is provided with a hub 42 for the reception of the stem 41 of a yoke corresponding to the yoke 40. The boxes 37 of the shaft 35 are mounted in universally-adjustable bearings for convenience in leveling up the shaft in regulating the machine.

I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes as fairly fall within the spirit and scope of my invention.

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

1. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of mandrel-supporting rolls located at the upper ends of the said stands which form solid supports for the said rolls, a rigid arm pivotally connected with each stand, one or more mandrel-retaining rolls mounted in each arm, a rock-shaft, and connections between the said shaft and

all of the said rigid arms, whereby the same are raised for simultaneously lifting the mandrel-retaining rolls.

2. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of mandrel-supporting rolls located at the upper ends of the said stands by which they are solidly supported, a bracket-arm projecting from the upper end of each stand, a rigid arm pivotally attached to each of the said bracket-arms, one or more mandrel-retaining rolls mounted in each of the pivotal arms, a rock-shaft, and connecting-rods between the said rock-shaft and all of the said pivotal arms which are thereby simultaneously raised and lowered.

3. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of mandrel-supporting rolls located at the upper ends of the said stands by which they are solidly supported, a bracket-arm projecting from the upper end of each stand, rigid arms pivotally connected with the outer ends of the said bracket-arms, mandrel-retaining rolls mounted in the said pivotal arms, a rock-shaft located below the level on which the said stands are supported, and connecting-rods between the said rock-shaft and all of the pivotal arms, whereby, when the shaft is rocked, the mandrel-retaining rolls are simultaneously raised or lowered.

4. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of mandrel-supporting rolls mounted in the upper ends thereof, mandrel-retaining rolls located above the mandrel-supporting rolls, and movably connected with the upper ends of the stands, a rock-shaft extending under the series of stands, connections between the said mandrel-retaining rolls and rock-shaft, whereby the same are raised and lowered, and universal-joint connection between the said shaft and stands.

5. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of a rock-shaft located below the level on which the said stands are supported, vertically-adjustable forks connected with the lower ends of the stands, boxes swiveled in the said forks and receiving the rock-shaft, rock-arms connected with the said shaft, mandrel-supporting rolls mounted in the upper ends of the stands, mandrel-retaining rolls pivotally connected with the upper ends of the stands, and connections between the said rock-arms and mandrel-retaining rolls, whereby the same may be simultaneously raised and lowered.

6. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, of mandrel-supporting rolls mounted therein, mandrel-retaining rolls, a rock-shaft extending under the stands, connection between the said rock-shaft and the mandrel-retaining rolls, whereby the same are raised and lowered, a rock-arm secured to the said shaft, and provided at its upper end with a toothed segment, a pinion meshing into the said segment, a hand-wheel connected with the pinion which is turned by it for rocking the shaft, and means for locking the said pinion in any of its positions.

7. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, including a driving-end stand, a rear-end stand and intermediate stands, of mandrel-supporting rolls located at the upper ends of the intermediate stands and the rear-end stand by which they are solidly supported, rigid arms pivotally connected with the upper ends of the said intermediate and rear-end stands, mandrel-retaining rolls mounted in the said pivotal arms, means for simultaneously lifting all of the said pivotal arms, and hence all of the mandrel-retaining rolls, a driving-shaft journaled in the said driving-end stand, a chuck connected with the said shaft and receiving the mandrel, and means for adjusting the said shaft and chuck vertically with reference to the said mandrel-supporting rolls.

8. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, including a driving-end stand, a rear-end stand and intermediate stands, of mandrel-supporting rolls located at the upper ends of the rear-end stand and the intermediate stands which support them solidly, arms pivotally connected with the upper ends of the said rear-end and intermediate stands, mandrel-retaining rolls mounted in the said pivotal arms, means for simultaneously operating the said arms for raising and lowering the mandrel-retaining rolls, a vertically-adjustable head mounted upon the driving-end stand, for which purpose it is formed at its lower end with a socket adapting it to be set over the upper end of the said stand, a shaft mounted in the said head in bearings located at the upper ends of the two arms thereof, a chuck connected with the said shaft and adapted to receive the mandrel, and means for adjusting the head vertically with respect to the mandrel-supporting rolls and for holding it in any of its adjusted positions.

9. In a machine for cross-wrapping rubber hose preparatory to vulcanization, the combination with a series of stands, including a driving-end stand, intermediate stands, and a rear-end stand, of mandrel-retaining rolls located at the upper ends of the rear-end stand and the intermediate stands which afford solid supports for them, pivotal arms connected with the upper ends of the intermediate stands and the rear-end stand, mandrel-retaining rolls mounted in the said arms, means for operating all of the said arms for simultaneously raising the mandrel-retaining

rolls, a driving-shaft mounted in the driving-end stand, a chuck secured to the said shaft for receiving the mandrel, and a slide mounted upon the rear-end stand for engagement with the rear end of the mandrel after the same has been introduced into the chuck, whereby the longitudinal movement of the mandrel is prevented.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK H. BREWSTER.

Witnesses:
LILLIAN D. KELSEY,
GEORGE D. SEYMOUR.