E. J. PENNYPACKER.

WELL CASING MACHINE.

APPLICATION FILED MAR. 9, 1909.

1,040,252.

Patented Oct. 1, 1912.

3 SHEETS—SHEET 1.

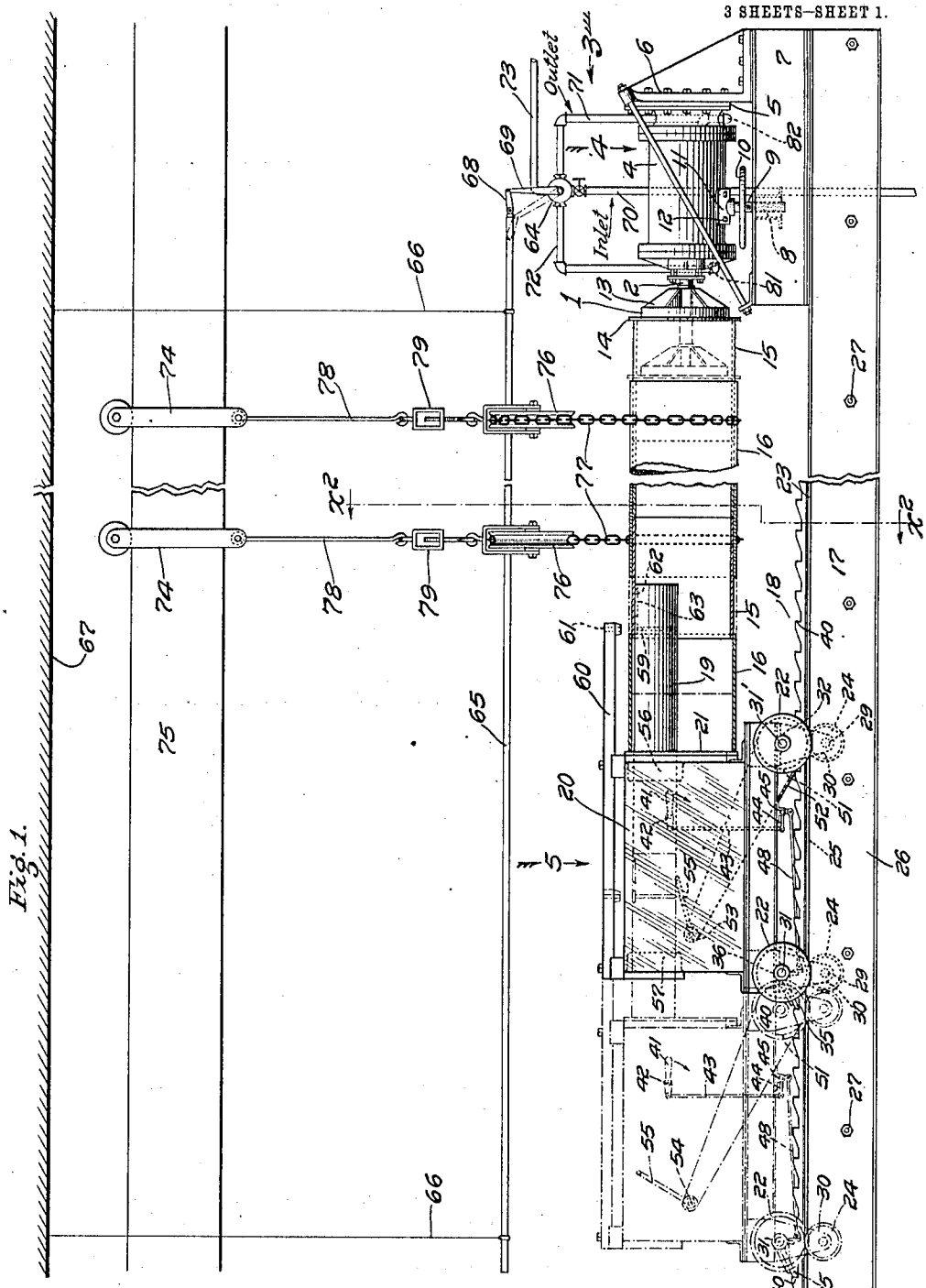

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

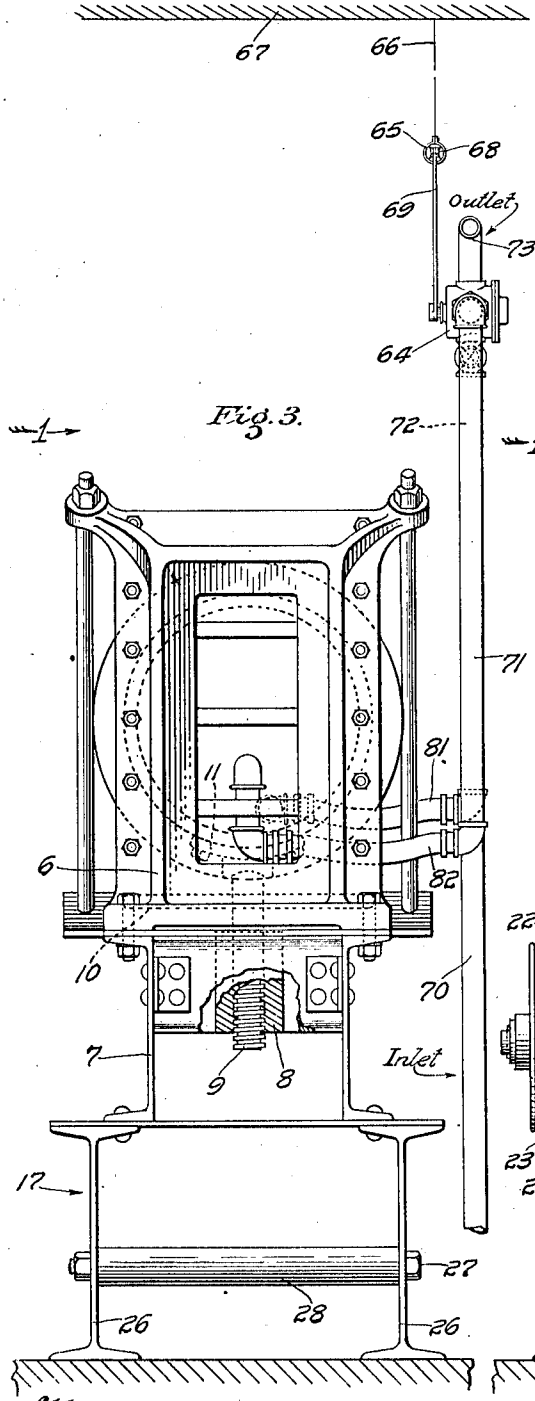
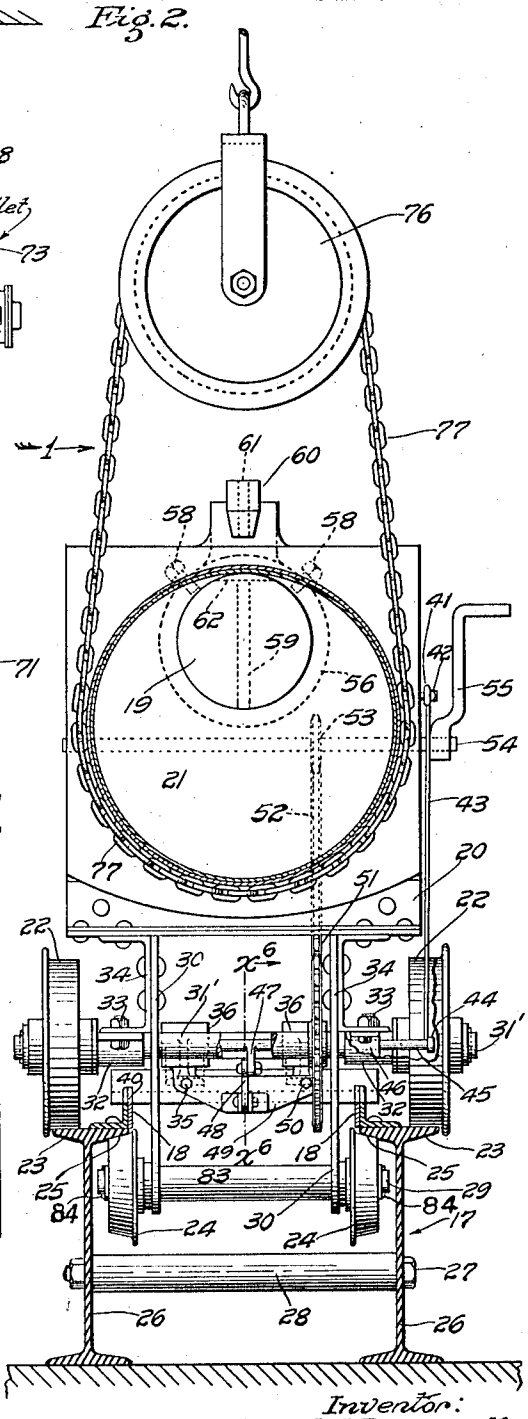


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

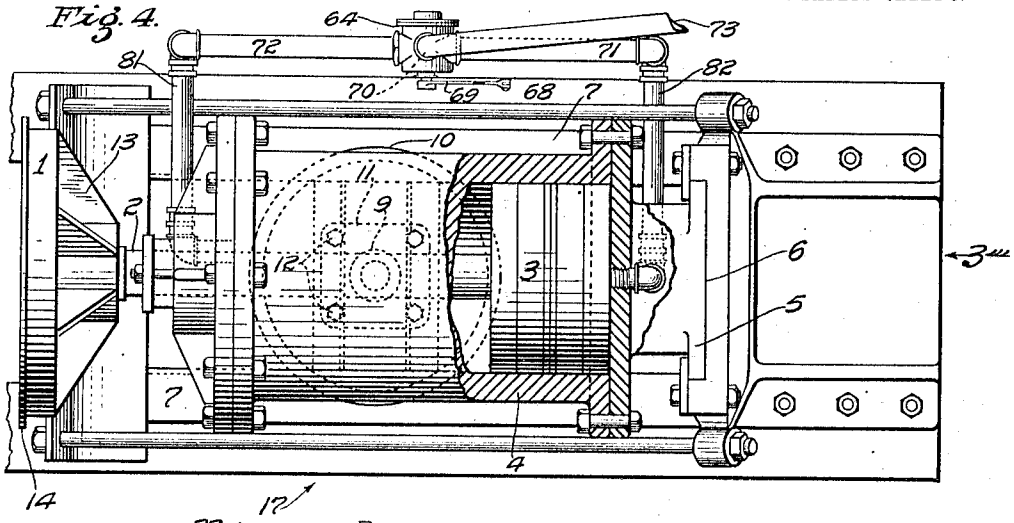


Fig. 5.

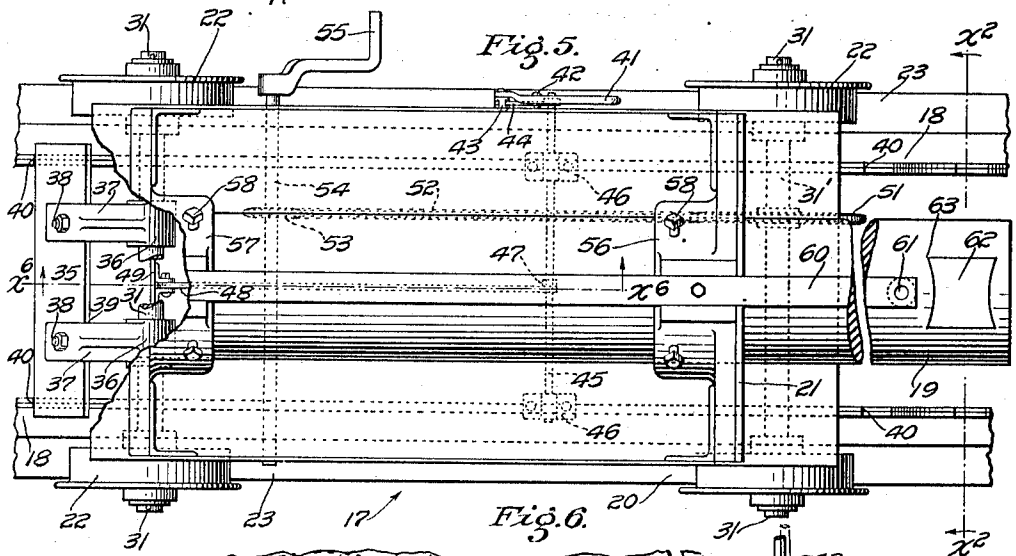
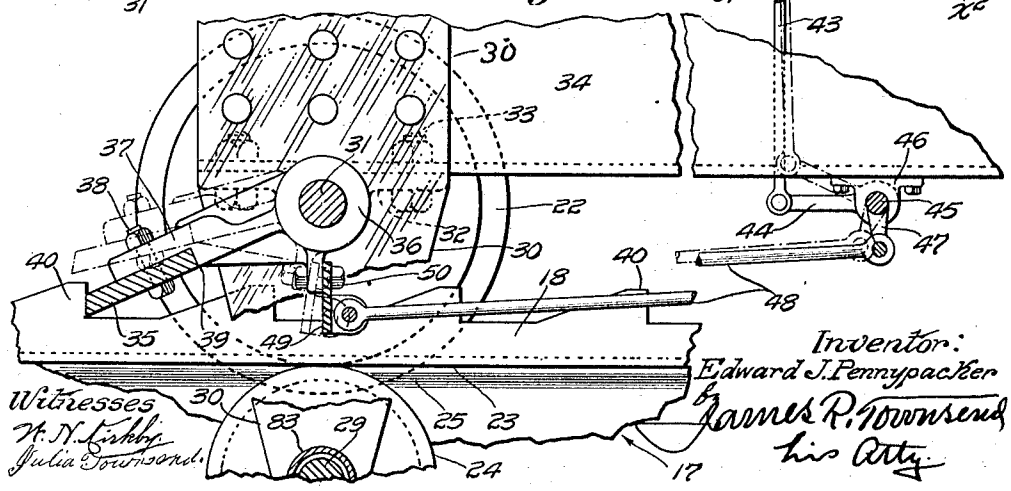


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD J. PENNYPACKER, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO BAKER IRON WORKS, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

WELL-CASING MACHINE.

1,040,252. Specification of Letters Patent. Patented Oct. 1, 1912.

Application filed March 9, 1909. Serial No. 482,410.

To all whom it may concern:

Be it known that I, EDWARD J. PENNYPACKER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Well-Casing Machine, of which the following is a specification.

This invention relates to a machine for manufacturing sections of well-casing by telescoping and riveting together joints of sheet-metal pipe. In manufacturing well-casing of this description separate single joints of pipe are first made from metal sheets the edges of which are riveted or welded together with a longitudinal seam; then the ends of such joints are squared, and then the end of one joint which is slightly tapered for the purpose, is forced into another joint to which it is tightly fitted, and other joints are successively telescoped therewith until the required pipe-section which may be of any desired length, is formed. It is desirable that the pipe-joints thus united shall fit each other very tightly so as to make a rigid casing that will stand the pressure of driving the same into the well to be cased, which well may in some instances be of great depth, as 2000 feet, more or less.

An object of the invention is to provide superior means for forcibly telescoping the joints together and holding them while they are being riveted whereby the work will be done with maximum rapidity, and joints that fit each other most tightly may be easily and evenly put together, thus making a strong, straight, rigid pipe. In the process of entering the joints, one end into another it is necessary for the workman to have direct access to the pipe section on top, bottom and both sides in order to effect the work in the most rapid and satisfactory manner.

An object of this invention is to construct a machine adapted to telescope the joints and in a manner to hold them, that will give free access of the operator of the joints for the purpose of entering one end of one joint into the end of another and for the purpose of riveting the joints together.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmental side elevation of a machine constructed in accordance with this invention and viewed from the left of Figs. 2 and 3. The parts are shown in solid lines in position ready for ramming a pipe-section to add another pipe-joint thereto, said pipe-joint being shown on the stake and against the abutment at the left of the pipe-section. Dotted lines at the left of the view indicate a position of the movable stake and its carriage before said joint was placed on the stake. Dotted lines at the right side of the view indicate the position of the ram-piston after the ramming has been effected. Fig. 2 is an elevation looking toward the left from line x^2, Fig. 1. Fig. 3 is an elevation looking to the left from the arrow 3 in Fig. 1. Parts are broken to show the screw that raises and lowers the ram. The parts shown in Fig. 2 are omitted from this view. Fig. 4 is a plan of the ram and its frame looking in the direction of the arrow 4 in Fig. 1. A portion of the cylinder is broken away to show the piston. Fig. 5 is a plan of the stake-carriage in position on the track, parts being broken to contract the view and expose parts that would otherwise be hidden. Fig. 6 is an enlarged detail on line x^6, Figs. 2 and 5, showing the device for locking the carriage against the thrust of the ram.

1 is a head mounted on a piston-rod 2 that is connected with a piston 3 which is operated by fluid pressure in a cylinder 4 to move the head horizontally. The parts 1, 2, 3, 4 constitute the ram. The same is adjustably mounted by means of a runner 5 which is fixed to the rear of the cylinder and is movable in a vertical way 6 that is supported by a frame 7 on which is mounted a nut 8 in which is a screw 9 controlled by a hand-wheel 10 and operating a block 11 that is fastened by bolts 12 to the cylinder 4 for raising and lowering the cylinder relative to the frame to bring the head centrally into line for ramming pipes of different diameters.

The head 1 may be of cast iron having ribs 13 at the back to give it rigidity and may be faced with a plate 14 of sheet-steel, boiler-iron, or other rigid material to engage a pipe-joint that is to form a portion of the well-casing section which is formed of alternate inner and outer joints, as at 15 and 16, telescoped together.

The frame 7 of the ram is mounted at one end of a track 17 along which is provided one or more racks 18 the teeth of which face in one direction along the track.

19 is a riveting stake fixed to a frame 20 and projecting therefrom toward the ramming head 1. Said frame 20 is provided with an abutment 21 that faces toward the ram to hold the pipe-joint 15 or 16, as the case may be, as it receives the thrust of a pipe-joint 16 or 15, as the case may be, which is to be telescoped therewith.

The frames 7 and 20 are relatively movable, and except for convenience of operation or construction it is immaterial whether it is the holding frame 20 or the ram-frame 7 that moves. Preferably, the ram-frame 7 is made stationary at one end of the track 17, and the holding frame 20 is movable along the track, being provided with wheels 22 to run on top of rails 23 of the track. In the form shown in the drawings, the ram-frame 7 is fixed to the track 17 and the holding frame 20 is movable therealong, being mounted on supporting wheels 22 running on the external flanges 23 of the track 17 and held against upward thrust by wheels 24 that run on internal flanges 25 of said track. The track may be formed of two I-beams 26 held together by bolts 27 spaced apart by spacers 28.

The axle 29 of the thrust-resisting wheels 24 is carried by hangers 30 which consist of plates through which the axles 31 of the supporting wheels 22 extend; said hangers 30 being perforated to receive the axles 29 and 31, the latter of which is connected with the frame 20 by boxes 32 which are secured by bolts 33 to the channel-iron hangers 34 to which the hangers 30 are rigidly fixed by rivets.

The stake-carriage composed of the frame 20, and the axles, wheels, and hangers just described, is free to roll along the track 17 in either direction except when locked by pawl 35 that is carried by sleeves 36 on one of the axles 31. Said sleeves 36 are provided with arms 37 to which the pawl 35 is secured by bolts 38, said arms being provided with gains 39 in which the ratchet-plates are seated; the purpose being to resist the thrust of the stake-carriage when the ramming is being effected. The pawl 35 is adapted to engage the teeth 40 of the racks except when held out of engagement therewith by means under the control of the operator. The means shown for this purpose consist of the hand-lever 41 pivoted at 42 to the stake-frame and connected by connecting-rod 43 with one arm 44 of a crank-lever, the shaft 45 of which is journaled in boxes 46 on the stake-frame underneath the stake, the other arm 47 of said crank-lever being connected by connecting-rod 48 with a bar 49 of the pawl that is fastened by bolts 50 to the sleeves 36 of the pawl so that when the lever 41 is depressed the pawl 35 may be lifted above the teeth 40 of the racks.

The holding carriage may be moved along the track by any suitable means. For this purpose a sprocket-wheel 51 is fixed to the rear axle 31′ of the holding carriage and is connected by a sprocket-chain 52 with a sprocket-wheel 53 that is fixed on sprocket-shaft 54 that is journaled in the frame 20 and is provided with a crank 55 by which it may be turned to rotate the carriage-wheels 22 in one or the other direction for increasing or decreasing the space between the abutment and the ram.

The stake 19 is rigidly mounted in sockets 56, 57, carried by the frame 20 and is held in place by set-screws 58. Said stake projects from the frame 20 toward the ram-head 1 a distance something greater than the length of one of the pipe-joints which go to make up the pipe-section. Said stake is provided with a vertical perforation 59 for burs to go through when the stake is used for punching holes in the pipe-joints to be connected.

60 is a goose-neck provided at its free end with the usual perforation 61 to guide the punch for punching holes in the pipe-joints.

62 is a steel anvil seated in a seat 63 to fit the stake for driving the rivets that are to unite the pipe-joints.

The stake and goose-neck just described are common in the art.

The impelling fluid, whether water, oil, steam, or air, may be controlled by a valve 64 operated by a shifting rod 65 which extends along the track within reach of the workmen, and may be suspended by cords 66 hung from the ceiling or from an elevated beam 67; said rod being connected by a link 68 with the valve-arm 69 so that as the rod is swung in one or the other direction it will move said valve-arm and turn the valve to direct the fluid from the inlet or supply-pipe 70 to one or the other side of the piston 3 through one or the other of the feed-pipes 71, 72; the exhaust passing out through the other feed-pipe 72 or 71 as the case may be, and through the valve 64 which is a four-way valve, to the outlet 73.

Trolleys 74 running on a track 75 and supporting sheaves 76 that carry loops 77, are provided to support the pipe-joints in position to be rammed. The connection 78 between said sheaves and trolleys are adjustable by means of turnbuckles 79 so that the height to which the pipe-section will be held may be regulated.

In practical operation two pipe-joints, as 15 and 16, will be started to telescope together and will then be placed upon the stake 19, and the stake-carriage will be brought sufficiently close to the head 1 when the same is retracted as in the position shown

in solid lines in Fig. 1, to allow the head when operated by its piston to drive the joints against the abutment 21, and thereupon to ram the one joint half-way into the other; said joints being of equal length. In the operation of ramming, the pawl 35 will be allowed to rest in the notches of the rack so that when the ramming occurs the holding-carriage will be held rigidly on the track by the pawl and the thrust-wheels. After the ram-head is retracted the loops 77 will be brought around the section just formed, and the two pipe-joints will be swung in the loops free from the stake, and the lever 41 will then be pushed down to lift the pawl 35; whereupon the operator may turn the crank 55, thus to retract the stake-carriage until another pipe-joint may be slipped onto or into the end of the pipe-section that is next the abutment. Then the carriage will be run forward as before until the stake has fully entered the pipe-section and the abutment is in position to hold the added joint for the ramming action, whereupon the operation of ramming will be repeated.

It is usually desired to rivet the pipe-joints together after they have been rammed. To do this each joint will be punched and riveted in the usual way while it is on the stake after having been rammed.

The stake is set on the carriage at such height as to accommodate the largest diameters of pipe intended to be rammed, and in order to bring the ramming head 1 to the appropriate height, the adjusting hand-wheel 10 may be turned in either direction as required to bring the center of the head into line with the axis of the pipe to be rammed. In order to allow this to be done readily the pipes 71 and 72 have flexible connections 81 and 82.

The lower ends of the hangers 30 may be held apart by a spacer 83 on the axle 29, and cotter-pins 84 may be passed through such axle outside the wheels 24 to hold the parts in place.

Particular attention is directed to the construction whereby no obstructions are in the way of the workman relative to the joints, the pipe-section or to the stake, so that he is given perfect freedom in handling the joints and section and the same are held by the stake ready for the riveting operation immediately after the ramming process has been performed, and all separation of the joints may be prevented by driving a number of rivets while the joints are held by the ram.

I claim:—

1. A track provided with rails having flanges, a carriage provided with wheels running on said track and provided with wheels running under the flanges of said track, said carriage also being provided with an abutment, a rack extending along the track, a pawl on said carriage to engage said rack, and a ram to telescope joints of pipe when held by said abutment.

2. In a well casing machine, a track formed of two I-beams spaced apart, two frames, one of which is movable along the track toward and from the other, wheels for the movable frame to run on flanges of the I-beams, wheels for the movable frame to run under flanges of the I-beams, a rack in fixed relation to the track, a pawl on the movable frame to engage the rack, a ram on one of said frames, an abutment on the other frame, and means to operate the ram.

3. A pipe machine comprising a base; a frame mounted on the base and provided with an abutment and with a pipe section supporting stake on the same side of the frame; a second frame mounted on the base; said frames extending up from the base and being in movable relation to each other; a cylinder mounted on the second frame; a piston in the cylinder; the cylinder on the second frame being opposed to the free end of the stake; a piston in the cylinder and a ram on the piston movable between the frames toward and from the stake and abutment; the space above the base and between the frames being open and unobstructed; means to supply fluid to the cylinder to operate the piston, and means to temporarily hold the frames in stationary relation to each other.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 3d day of March, 1909.

E. J. PENNYPACKER.

In presence of—
JAMES R. TOWNSEND,
JULIA TOWNSEND.