A. E. HIGGINS & J. D. ORMROD.

CORE CUTTING MACHINE.

APPLICATION FILED MAY 13, 1909.

944,137.

Patented Dec. 21, 1909.

3 SHEETS—SHEET 1.

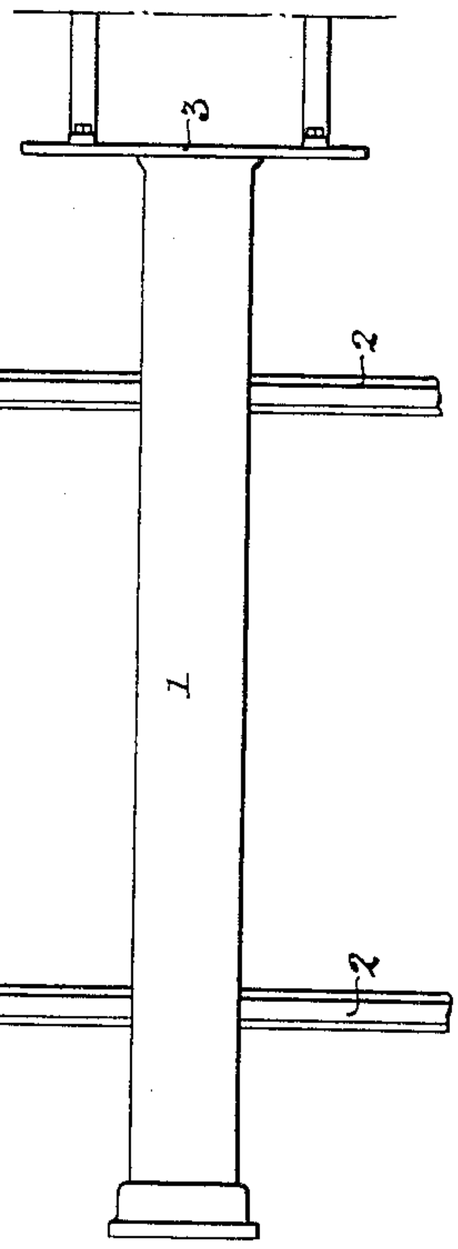


Fig. 2.

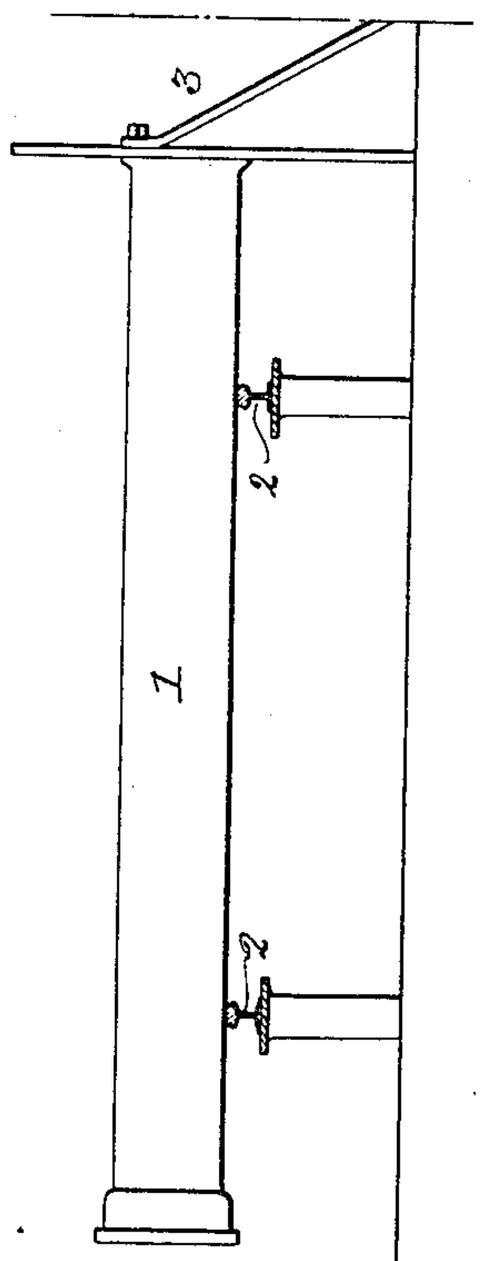
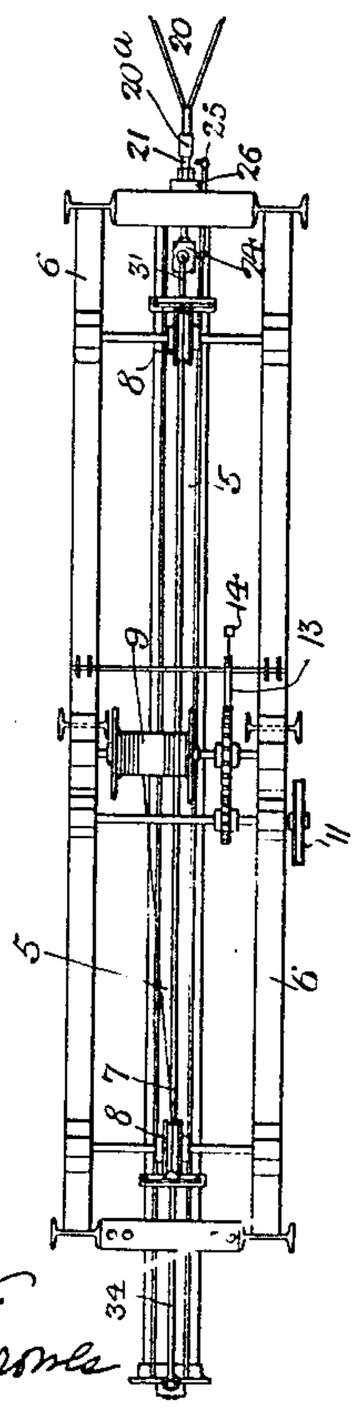
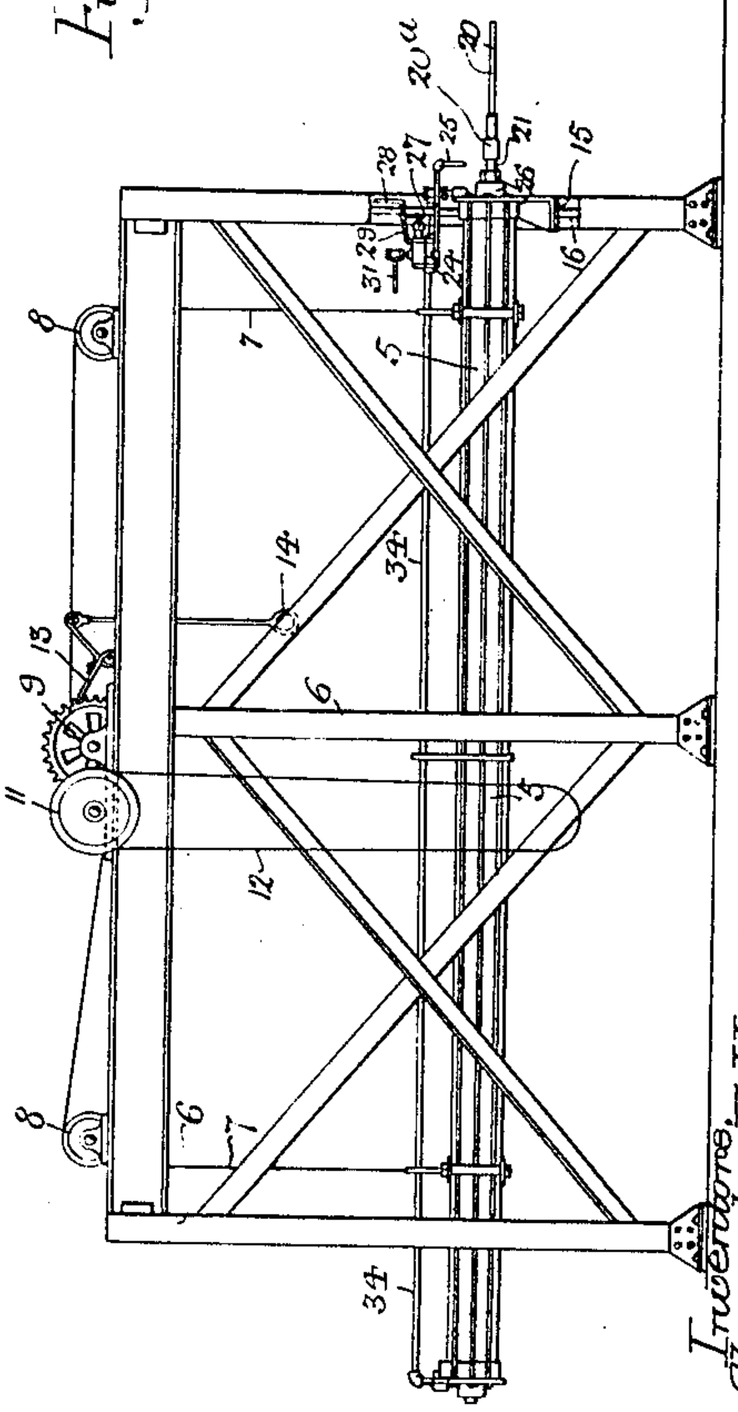


Fig. 1.





Witnesses.—

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Munn & Co.

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3 SHEETS—SHEET 2.

Fig. 3.

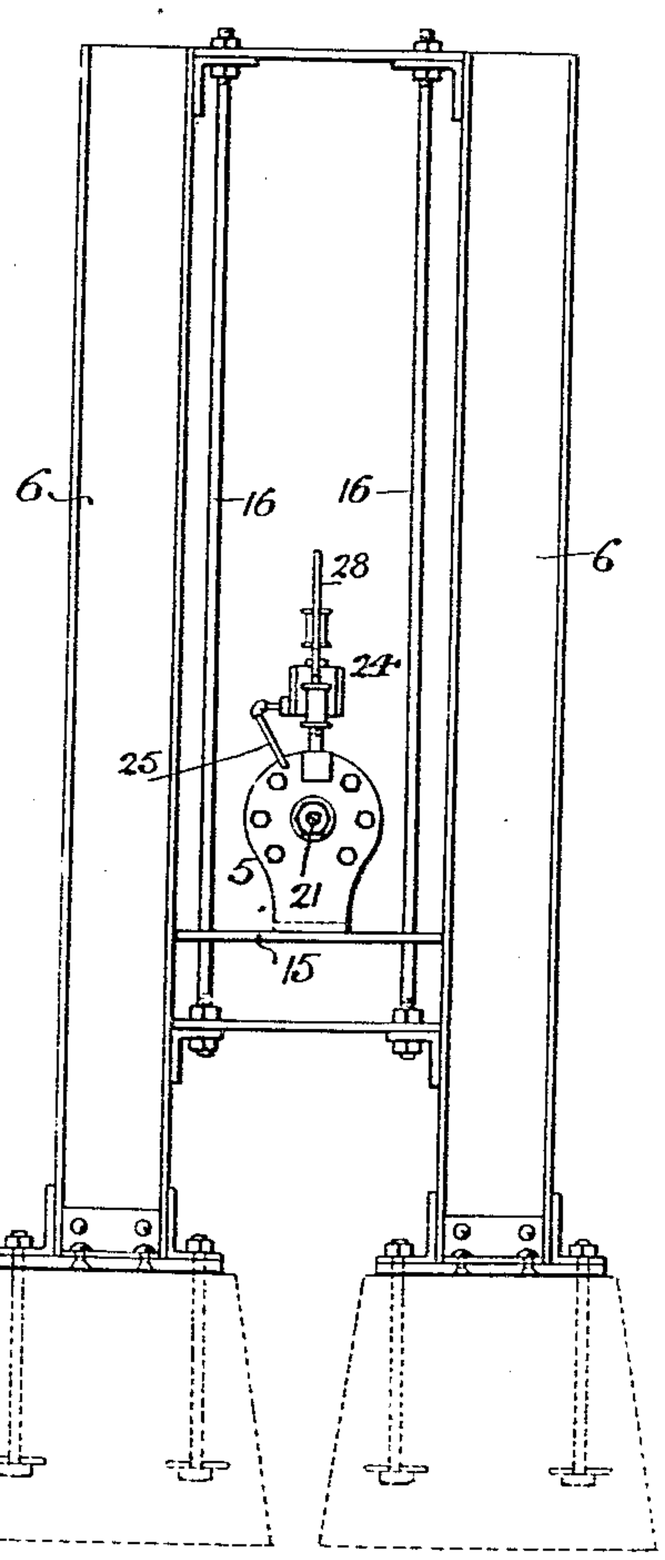


Fig. 6.

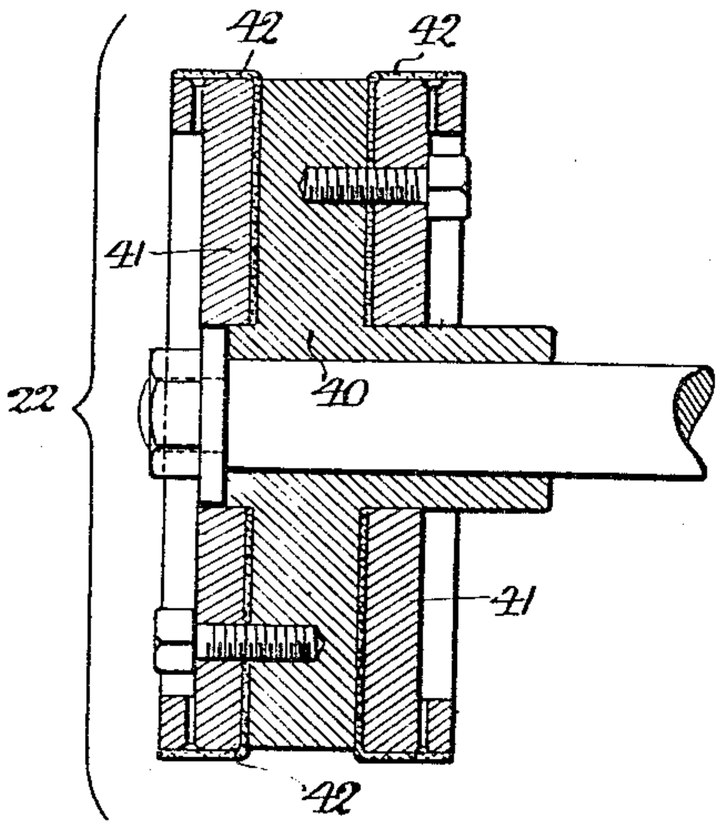
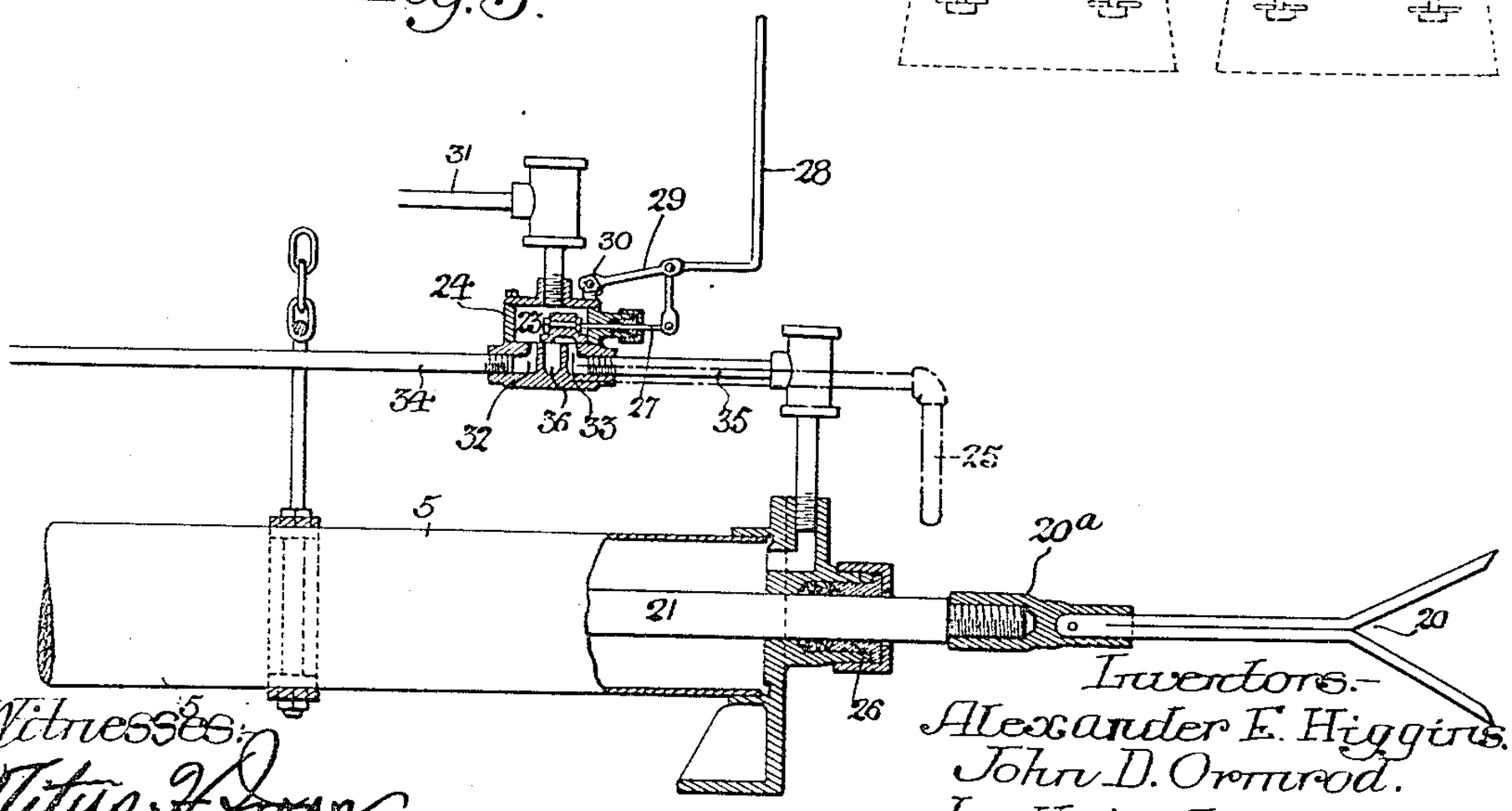


Fig. 5.



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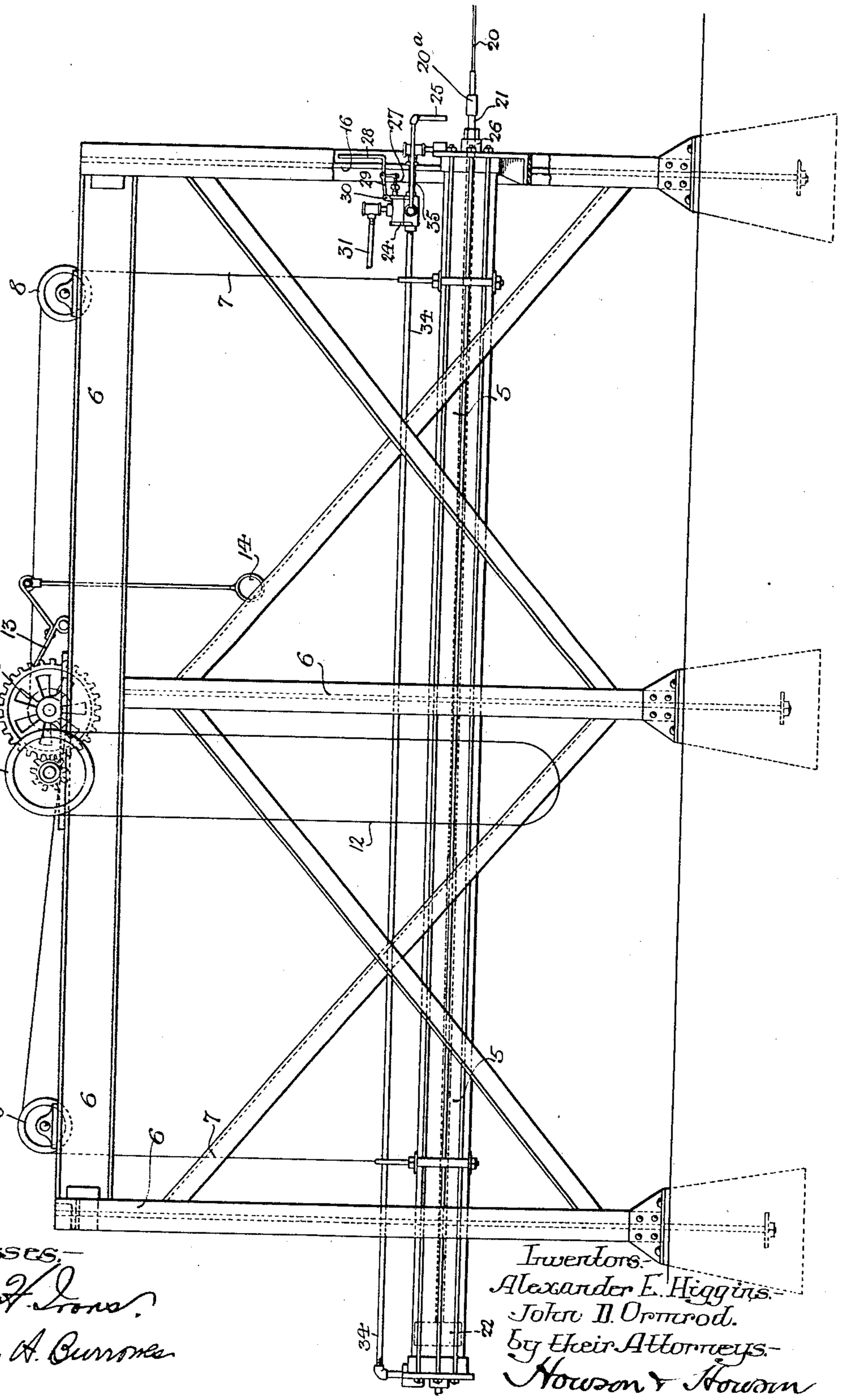
3 SHEETS—SHEET 3.

Fig 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER E. HIGGINS AND JOHN D. ORMROD, OF EMAUS, PENNSYLVANIA.

CORE-CUTTING MACHINE.

944,137. Specification of Letters Patent. Patented Dec. 21, 1909.

Application filed May 13, 1909. Serial No. 495,720.

To all whom it may concern:

Be it known that we, ALEXANDER E. HIGGINS and JOHN D. ORMROD, citizens of the United States, and residents of Emaus, Lehigh county, Pennsylvania, have invented certain Improvements in Core-Cutting Machines, of which the following is a specification.

Our invention relates to the art of pipe founding, and consists of means for stripping or disintegrating the cores left in iron pipes after the latter have been cast; the object of our invention being to provide mechanical means that will score or tear away such core lining.

Our invention is fully shown in the accompanying drawings, in which:

Figure 1, is a side elevation of a structure embodying our invention; Fig. 2, is a plan view of the same; Fig. 3, is a front elevation; Fig. 4, is an enlarged side elevation, and Figs. 5 and 6, are views illustrating details of the structure forming the subject of our invention.

In the drawings, 1 represents a pipe mounted in position to have its internal core or shell of sand removed. The pipe is shown as mounted upon rails 2 forming a run or skidway, and as abutting against a support 3, suitably braced and designed to resist the pressure against the pipe during the operation of scoring or removing the core. Disposed in front of the pipe and in line with the same is a cylinder 5 mounted within a suitable framework 6, and carried by chains or cords 7 which pass over pulleys 8 at the top of said frame to a drum 9, whereby such cylinder may be raised and lowered as desired. To accomplish such action, a chain wheel 11, suitably geared to the drum is provided, with an operating chain 12, while the gear on the drum is provided with a locking pawl or brake 13, having a handle 14 within the range of the operator.

The cylinder is controlled at the front end of the frame; a plate 15 being secured to such end and guided on vertical rods 16 suitably secured to the framework. The rear of the cylinder, however, may be, and preferably is, entirely free so that it may accommodate itself to any inequality in the pipe reached by the cutting means.

The stripping or cutting means to act upon the sand core within the pipe may consist of a pair of cutting fingers 20 having relatively sharp points and carried by a piston rod 21, to which is secured a piston 22 within said cylinder; said piston being movable back and forth within the same by the use of fluid under pressure, preferably air. A valve 23 is provided at the forward end of the cylinder, mounted in a suitable chest 24, whereby the fluid under pressure may be directed to either side of the piston so as to push the cutting means into the pipe or withdraw the same therefrom, and during the latter action, the air behind the piston is preferably exhausted through a nozzle 25 which is directed against the piston rod so as to clean from the latter any sand that may have collected thereon and thereby avoid cutting the packing of the gland 26 in the head of the cylinder.

In operation, the pipe is presented to the cutting fingers; the valve is operated to turn the air into the cylinder so as to push such cutting fingers into the pipe, and in practice, these fingers will be slightly larger than the inner diameter of the pipe so that it will be necessary to slightly compress them before they are entered. They may then be withdrawn, given a half turn, or the pipe may be given a half turn and again sent through the pipe, which action has the effect of cutting four longitudinal grooves in the core whereby the sand may readily separate and be discharged by tilting or upending the pipe. If desired, we may employ three or four cutting fingers so as to accomplish the complete scoring or cutting of the core at one operation. The fingers are carried by a socket 20^a which may be readily attached to or detached from the piston rod.

In order to operate the piston back and forth within the cylinder, a three-way valve construction is employed, shown at 23 in Fig. 5; the valve employed being a slide-valve of ordinary D-shape and operated by a rod 27 to which a lever or handle 28 is connected. The lever is fulcrumed to a link 29 which is pivotally connected to a post 30 on top of the valve chest. Pressure enters from a pipe 31 and may be directed, depending upon the position of the valve, to the front or rear of the cylinder as desired. The lower portion of the valve casing is provided with the necessary ports or passages 32 and 33 communicating with the inlet pipes 34 and 35 leading to the front and rear of the cylinder, and a middle port or passage 36 communicating with the exhaust

pipe or nozzle 25; the valve being constructed so as to permit exhaust from either end of the cylinder through said pipe or nozzle when pressure is directed to the opposite end.

The piston is preferably of the construction shown in Fig. 6, comprising a support 40, and follower plates 41, which retain a covering 42, of leather or other suitable material, preferably an oil tan leather, which contacts with the cylinder and forms a packing for the piston.

It will be understood that while we believe the foregoing to be the best and most convenient embodiment of our invention, we do not intend to limit the same to the specific construction shown and described.

We claim:

1. The combination of a support for maintaining a pipe in a substantially horizontal position, a framework, a horizontally movable cutting tool carried by said framework and reciprocable in and out of said pipe, said tool being free to yield to any inequality of the wall of the pipe, and means for operating said tool.

2. The combination of a support for maintaining a pipe in a substantially horizontal position, a framework, a vertically adjustable cylinder suspended within said framework, said cylinder being substantially horizontally disposed, and a cutting tool operated by said cylinder and horizontally movable into and out of said pipe.

3. The combination of a pipe support, a framework, a cylinder within said framework, a guiding support for the forward end of said cylinder, and a cutting tool operable by said cylinder and movable into and out of said pipe, said cylinder being unconfined at its rear end whereby the cutting tool may readily follow any inequalities in the pipe.

4. The combination of means for supporting a pipe, a framework, a cylinder suspended within said framework and adjustable vertically therein, a cutting tool, a piston rod to which said tool is connected, and a piston within said cylinder for operating the rod to move the tool into and out of said pipe.

5. The combination of means for supporting a pipe, a framework, a cylinder disposed within said framework, means for raising and lowering said cylinder, a cutting tool, and a piston and piston rod within said cylinder to which said tool is connected and whereby it is operated.

6. The combination of means for supporting a pipe, a framework, a cylinder suspended within said framework and capable of substantially free movement from its points of suspension, means for raising and lowering said cylinder, means for guiding the forward end of the same, a cutting tool, a piston and piston rod within said cylinder to which said tool is connected, and means for directing fluid under pressure to move said piston in opposite directions.

7. The combination of a support for maintaining a pipe in a substantially horizontal position, a framework, a vertically adjustable cylinder suspended within said framework, said cylinder being substantially horizontally disposed, a cutting tool, a piston within said cylinder, a piston rod connected thereto and to the cutting tool, and means for directing fluid under pressure to the opposite ends of said cylinder to move the piston and carry said cutting tool into and out of the pipe.

8. The combination of a support for a pipe, a framework, a cylinder disposed in said framework, a cutting tool carried by said cylinder, a piston within said cylinder, a piston rod connected thereto and to the cutting tool, means for directing fluid under pressure to said cylinder to move the piston therein, and means for directing the exhaust from said cylinder to clean the piston rod as it is drawn out of a pipe.

9. The combination of a support for a pipe, a framework, a cylinder disposed in said framework, means for raising and lowering said cylinder, a cutting tool carried by said cylinder, a piston within said cylinder, a piston rod connected thereto and to the cutting tool, means for directing fluid under pressure to said cylinder to move the piston therein and carrying the tool into and out of said pipe, and means for guiding said cylinder at its forward end.

10. The combination of a relatively movable horizontally suspended cylinder, a piston and piston rod, a cutting tool carried by said piston and movable into and out of a pipe, and guiding means for the forward end of said cylinder, said means serving to anchor the cylinder against longitudinal movement.

11. The combination of a framework, a cylinder horizontally suspended within said framework and vertically adjustable, said cylinder being relatively movable, guiding means for the forward end of said cylinder, said means serving to prevent longitudinal movement of the cylinder, and a cutting tool operable by said cylinder and movable into and out of a pipe.

12. The combination of a framework, a cylinder, flexible suspending means for said cylinder carried by the framework, a guiding support for the forward end of said cylinder designed to prevent longitudinal movement of the same, and a cutting tool operable by said cylinder and movable into and out of a pipe, said cylinder being unconfined at its rear end whereby it may respond to movement imparted to the cutting tool due to inequalities in the pipe.

13. The combination of a cylinder, a cutting tool, a piston rod to which said tool is connected, a piston within said cylinder, means for operating said piston to cause the rod to move the tool into and out of said pipe, and means for directing the exhaust against the piston rod.

14. The combination of a framework, a cylinder horizontally disposed within said framework, flexible supporting means for said cylinder, means for operating said supporting means to raise and lower the cylinder, a cutting tool, a piston and piston rod within said cylinder to which said tool is connected, and means for directing fluid under pressure to said cylinder to operate said tool.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

ALEXANDER E. HIGGINS.
JOHN D. ORMROD.

Witnesses:
JOHN M. STORTZ,
CHAS. P. HELLER.