No. 723,529. PATENTED MAR. 24, 1903.

F. W. HUDSON.

SAND MOLDING MACHINE.

APPLICATION FILED AUG. 18, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

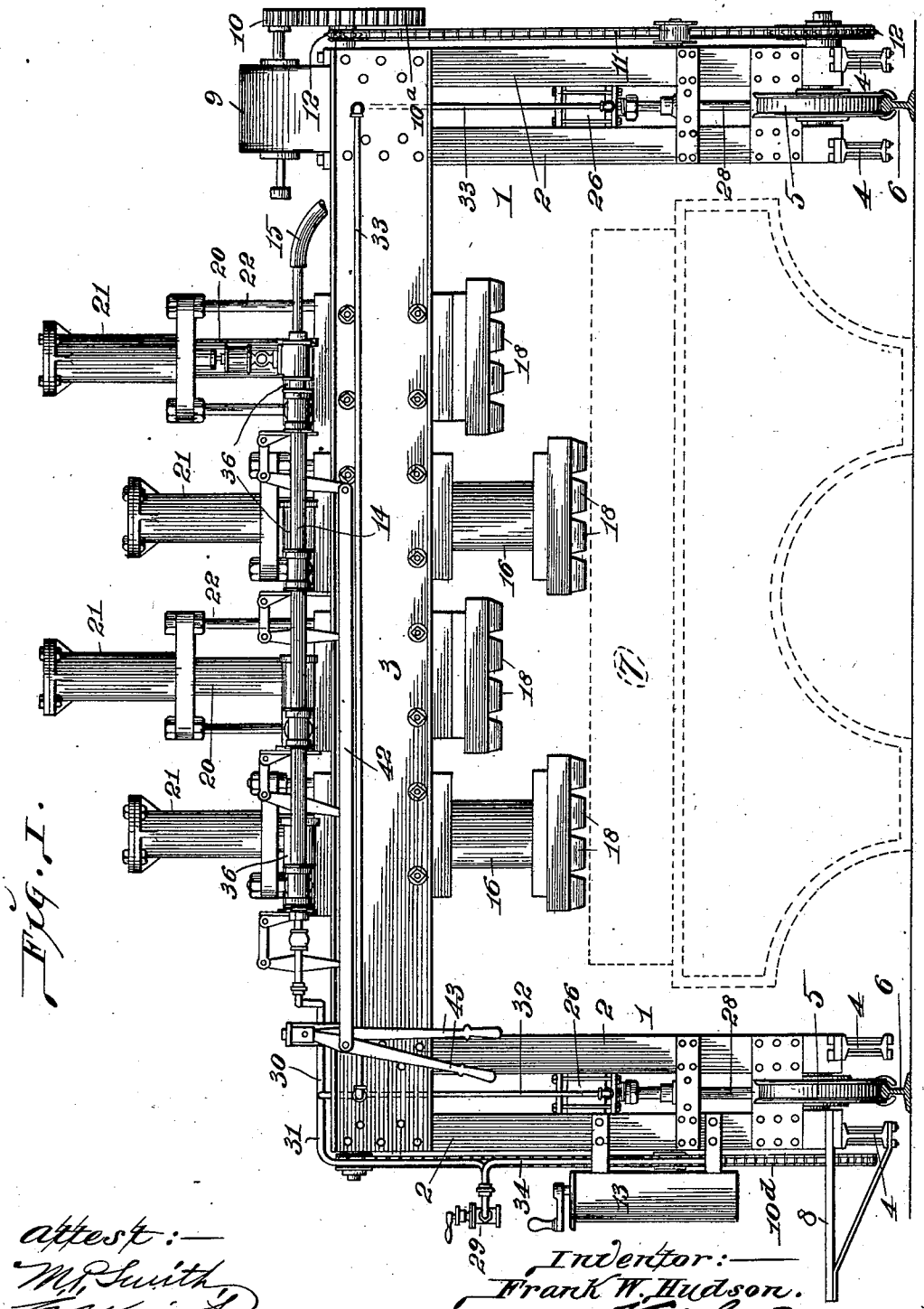


Fig. 1.

Attest:—
M. P. Smith
E. S. Knight

Inventor:—
Frank W. Hudson.
By Wright Brown & Quinby
atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 723,529. PATENTED MAR. 24, 1903.

F. W. HUDSON.

SAND MOLDING MACHINE.

APPLICATION FILED AUG. 18, 1902.

NO MODEL. 3 SHEETS—SHEET 2.

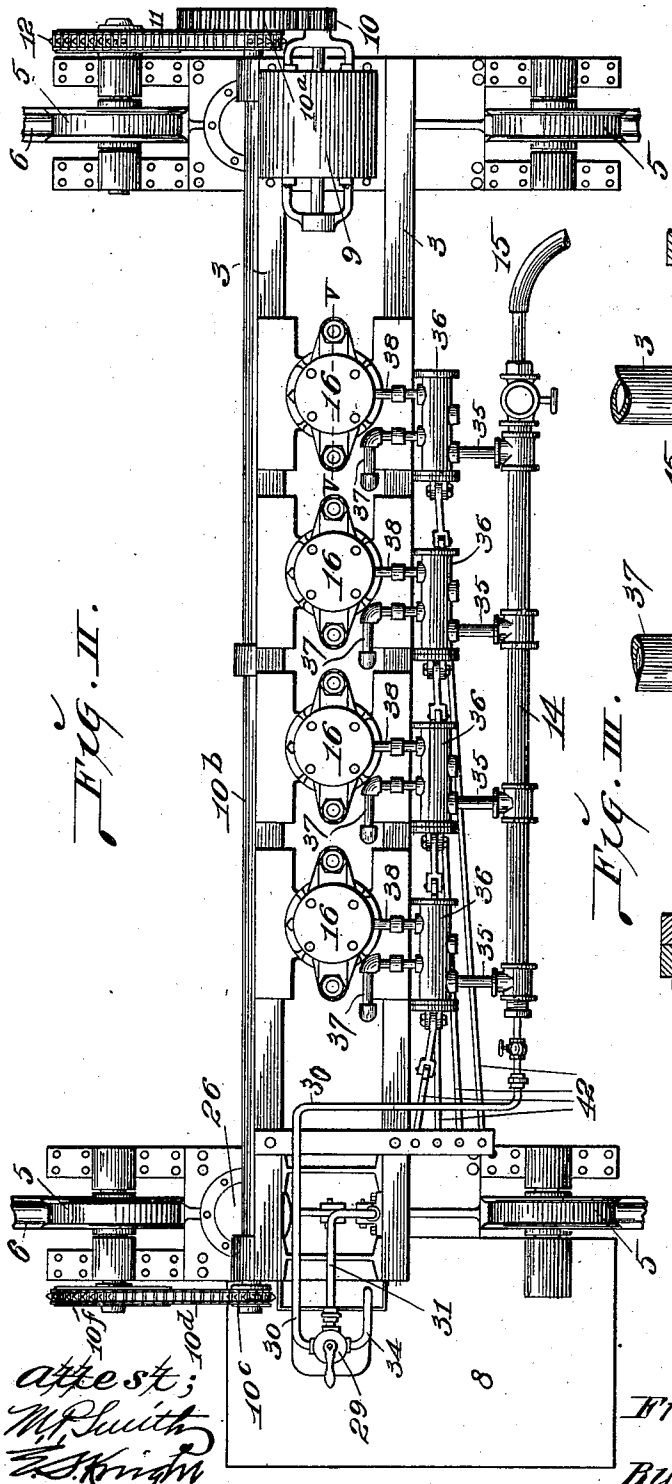


Fig. II.

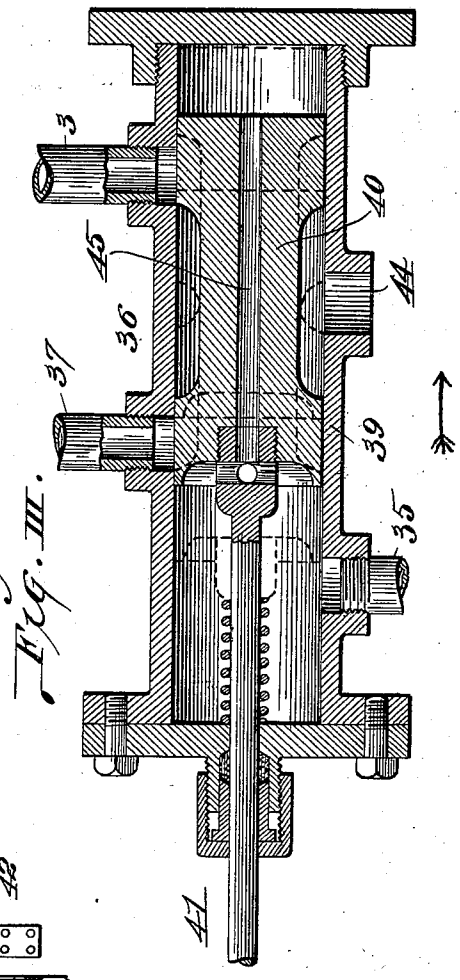


Fig. III.

Attest;
M. P. Smith
W. S. Knight

Inventor;
Frank W. Hudson;
By Knight Bros
atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 723,529. PATENTED MAR. 24, 1903.

F. W. HUDSON.

SAND MOLDING MACHINE.

APPLICATION FILED AUG. 18, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

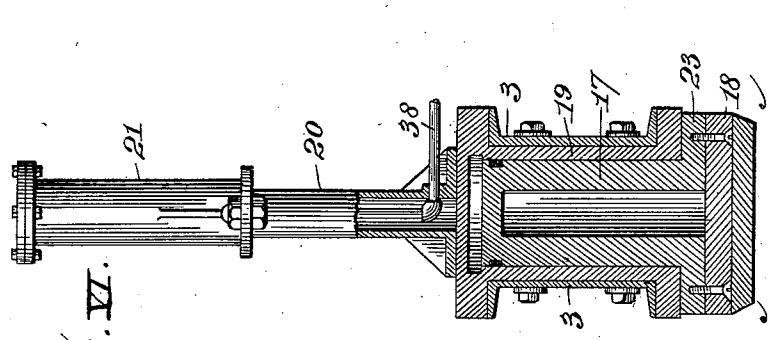


Fig. VI.

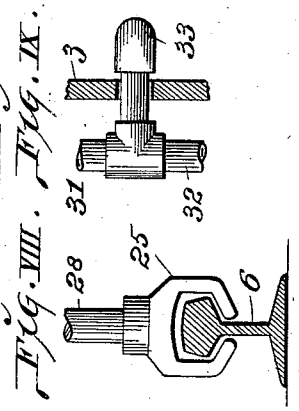


Fig. VIII. Fig. IX.

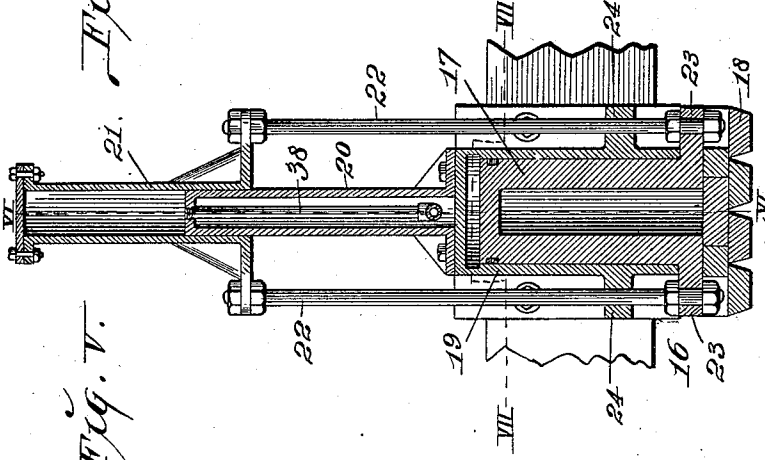


Fig. V.

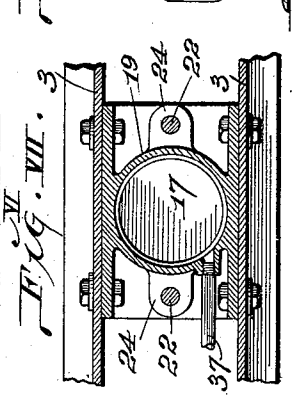


Fig. VII.

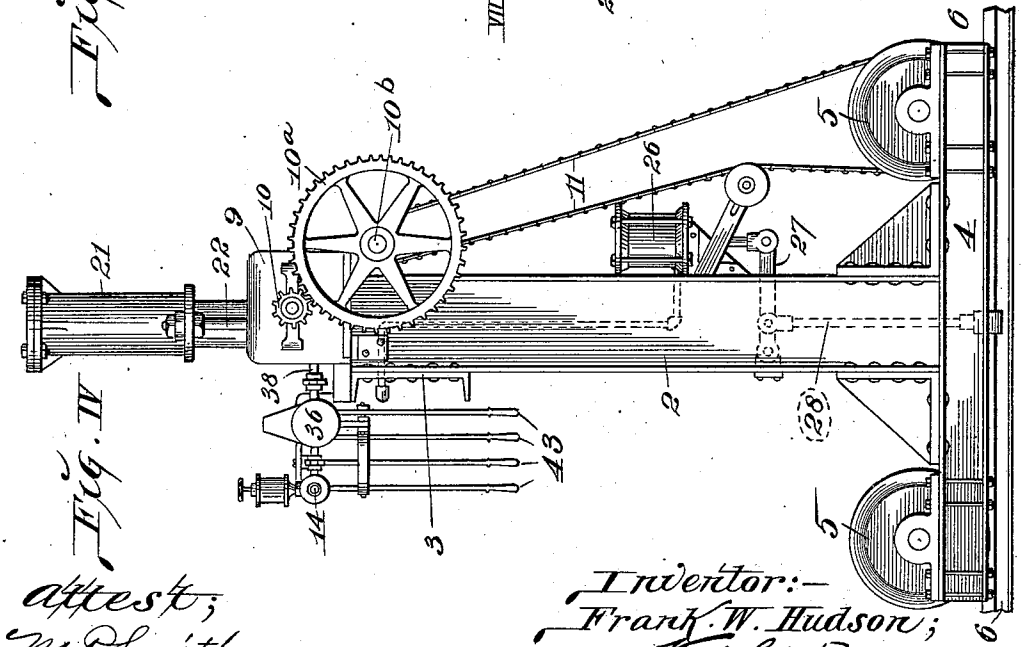


Fig. IV.

Attest;
W. P. Smith
E. S. Knight

Inventor:—
Frank W. Hudson;
By Knight Bros
Atty's.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK W. HUDSON, OF EAST ST. LOUIS, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AMERICAN STEEL FOUNDRIES, A CORPORATION OF NEW JERSEY.

SAND-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 723,529, dated March 24, 1903.

Application filed August 18, 1902. Serial No. 120,051. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. HUDSON, a citizen of the United States, residing in the city of East St. Louis, in the State of Illinois, have invented a certain new and useful Improvement in Sand-Molding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a portable machine for ramming the sand in flasks in making molds for metal castings.

The object of my invention is to so construct such a machine that a number of flasks and flasks of different sizes over which the machine has been moved can be rammed up at one time and then the machine moved over another set of flasks to ram the sand therein. The manipulation of the machine in all of its movements is done by a single operator.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a side elevation of my improved machine. Fig. II is a top or plan view. Fig. III is an enlarged horizontal section of one of the main valves. Fig. IV is an end view of the machine. Fig. V is a vertical section taken on line V V, Fig. II. Fig. VI is a vertical section, part in elevation, taken on line VI VI, Fig. V. Fig. VII is a horizontal section taken on line VII VII, Fig. V. Fig. VIII is a view of one of the holding-clips. Fig. IX is a detail view of the pipe that leads to the cylinders of the holding-clips.

Referring to the drawings, 1 represents the framework of the machine, consisting of end standards 2 and top horizontal beams 3, secured to the upper ends of the standards. The lower ends of the standards are formed with feet 4, to which are journaled wheels 5, that rest upon track-rails 6. The above-named parts constitute a carriage. The beams 3 carry the rams and are elevated sufficiently high to pass over the flask or flasks 7.

At one end of the machine is the operator's platform 8. The flasks to be rammed are placed between the track-rails 6, and the machine is moved on the rails to bring the rams over the flasks by means of an electric motor 9, mounted on the beams 3, (preferably at the far end from the operator's platform,) which is geared to the shaft of one of the wheels 5 by means of pinions 10 and 10^a, a chain 11, and chain-wheels 12. The pinion 10^a is secured to one end of a shaft 10^b, that extends the length of the machine and has secured to its other end a chain-wheel 10^c, connected by a chain 10^d to a chain-wheel 10^f, that is secured to the axle of one of the wheels 5 on this end of the machine. Power is thus applied to both ends of the machine for moving it along the track-rails.

The controller 13 of the motor 9 is located at the platform 8. It is suitably connected to one of the standards 2 and is properly wired to the motor.

14 represents a supply-pipe carried by the machine and from which the compressed air, steam, or other fluid is taken to operate the rams and the locks that hold the machine to its adjustments. The fluid enters this pipe through a hose 15.

16 represents the rams of the machine, of which there may be any desired number. I have shown four. Each ram consists of a follower or piston 17, to which is secured a head 18 and which fits within a cylinder 19. Above the cylinder 19 and secured thereto is a stationary piston 20, over which fits a movable cylinder 21, that is connected by rods 22 to ears 23, projecting from the lower end of the piston 17. The rods 22 pass through guide lugs or projections 24, extending from the cylinder 19.

When the machine has been adjusted to its position over the flasks, it is locked and held from movement while the flasks are being rammed by means of clips 25, (see Figs. I and VIII,) that engage the heads of the rails 6, the clips being drawn up tight against the heads of the rails by the use of cylinders 26, to the piston-rods of which the clips are connected by means of levers 27 and rods 28. The levers are pivoted to the standards 2, and as their free ends are drawn upwardly the clips are pulled against the heads of the rails, thus holding the machine to its adjustment. Fluid is admitted to the cylinders 26, beneath the pistons therein, through a valve 29, located in a pipe 30, extending from the

pipe 14. The pipe 30 has a portion 31 leading from the valve 29 toward the cylinders 26, and the part 31 of the pipe has a branch 32 leading to the cylinder 26 at the near end of the machine and a branch 33 leading to the cylinder 26 at the far end of the machine. The valve 29 is located down within handy reach of the operator when standing on the platform 8. The valve has an exhaust-pipe 34.

When the machine has been adjusted and locked in its position, the rams are independently operated to pack the sand in the flasks. This is accomplished by fluid admitted to the cylinders 19 from the pipe 14 through pipes 35, valve mechanisms 36, inlet-pipes 37, connecting with the cylinders 19, to lower the rams, and inlet-pipes 38, connecting with the cylinders 21, to raise the rams. The pipes 37 connect with the cylinders 19 above the pistons 17, so that when fluid is admitted to the cylinders the piston will be depressed. The pipes 38 preferably extend up through the fixed pistons 20, as shown in Fig. V, and it will be understood that when fluid enters the cylinders 21 the pistons 17 will be raised.

Each valve mechanism 36 is composed of a cylinder 39 and a piston or slide-valve 40. The stems 41 of the pistons are connected by jointed rods 42 to levers 43. There is a separate lever for each valve mechanism, and these levers are located within handy reach of the operator standing on the platform 8.

When the rams are to be lowered, the operator moves the pistons 40 in the direction of the arrow, Fig. III, and fluid will then pass through the pipes 35 and 37 to the cylinders 19. When the piston is in this position, air will exhaust from the cylinder 21, through the pipes 38, around the reduced middle part of the valve 40, and out through the exhaust-opening 44 in the cylinder 39. To raise the rams, the valves 40 are moved in the other direction until their reduced parts come opposite the pipes 37. The air will then exhaust from the cylinders 19, and air will enter the cylinders 21 by passing through the longitudinal ports 45 in the valves 40 and through the pipes 38.

A molding-machine thus made is simple in construction, effective in operation, is not liable to get out of order, and can be manipulated in all of its movements by a single person.

I claim as my invention—

1. In a molding-machine, the combination of a traveling frame, means carried thereby for propelling it, a series of rams mounted in the frame, an operator's platform secured to the frame, a fluid-supply pipe, pipes forming communications between said pipe and rams, valve mechanisms located in said pipes, and levers connected to said valve mechanisms, substantially as set forth.

2. In a molding-machine, the combination of a carriage, a series of rams carried by the carriage, an operator's platform secured to the carriage, a fluid-supply pipe, pipes forming communications between said pipe and rams, valve mechanisms, levers located near said platform and connected to said valve mechanisms, clips adapted to engage the rails upon which the carriage moves, and means for moving the clips consisting of cylinders, a connection between the said clips and the piston-rods of the cylinders, a pipe forming a communication between said supply-pipe and said cylinders, and a valve located in the last-mentioned pipe near said platform, substantially as set forth.

3. In a molding-machine, the combination of a carriage, a series of rams carried by the carriage, means for operating the rams, and means for locking the carriage to its adjustment consisting of clips adapted to engage the rails upon which the carriage moves, cylinders to the pistons of which said clips are connected, a supply-pipe, a pipe connecting said supply-pipe to said cylinders, and a valve located in said pipe, substantially as set forth.

4. In a molding-machine, the combination of a carriage, an operator's platform secured to the carriage, an electric motor carried by the carriage, for propelling it, a controller for said motor located adjacent to said operator's platform, a series of rams carried by said carriage, mechanism for operating said rams controlled by levers adjacent to said operator's platform, a lock for holding the machine to its adjustments and means for operating said lock provided with a valve located adjacent to said operator's platform, substantially as set forth.

FRANK W. HUDSON.

In presence of—
E. S. KNIGHT,
M. P. SMITH.