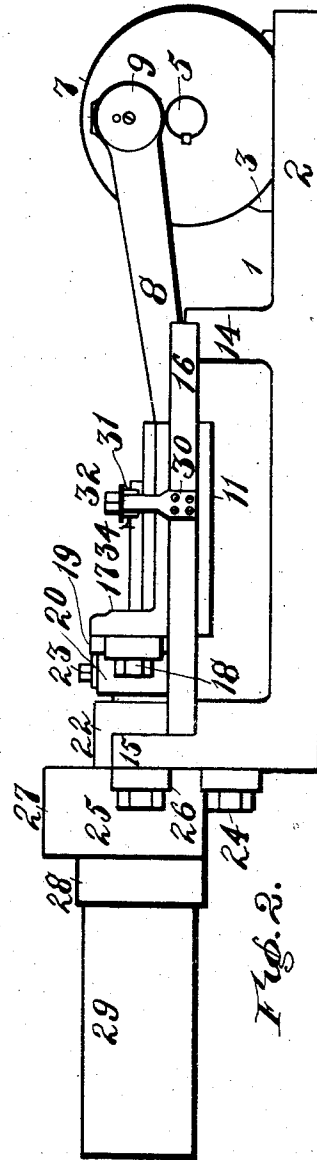
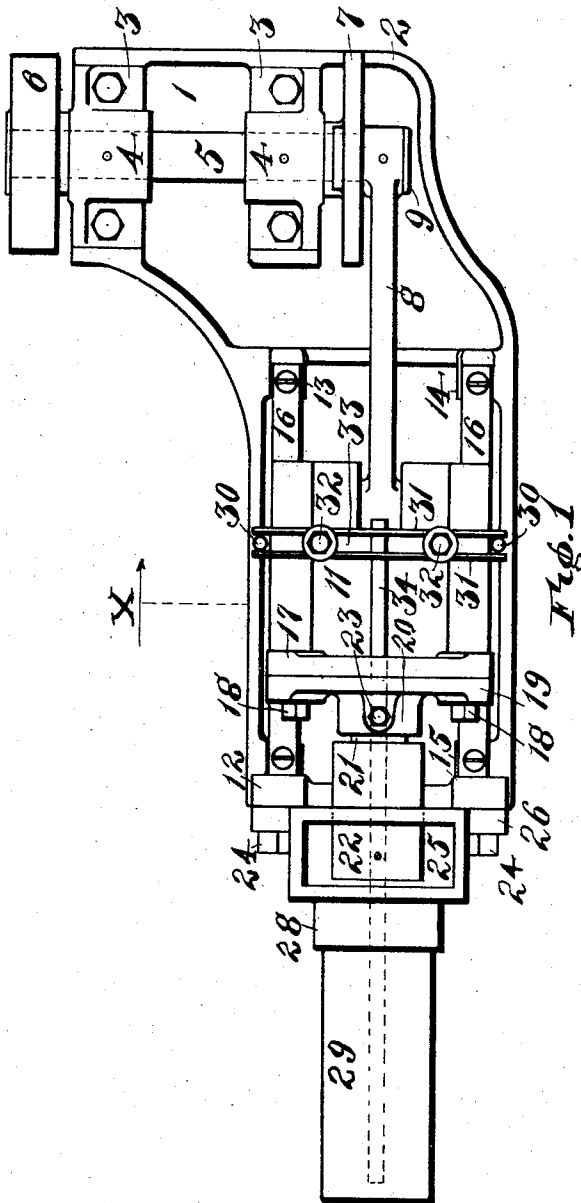


F. C. FRANCISCO.
CORE MAKING MACHINE.
APPLICATION FILED OCT. 17, 1907.

906,005.

Patented Dec. 8, 1908.

2 SHEETS—SHEET 1.



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by C. E. Humphrey,
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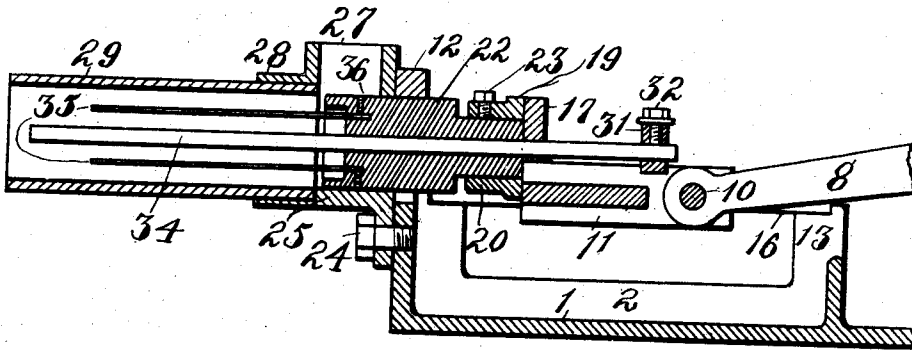


Fig. 3.

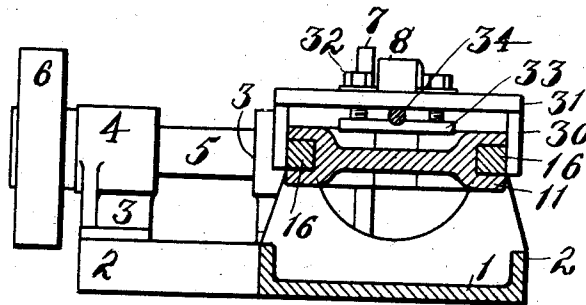


Fig. 4.

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UNITED STATES PATENT OFFICE.

FRED C. FRANCISCO, OF CUYAHOGA FALLS, OHIO.

CORE-MAKING MACHINE.

No. 906,005.

Specification of Letters Patent.

Patented Dec. 8, 1908.

Application filed October 17, 1907. Serial No. 397,831.

To all whom it may concern:

Be it known that I, FRED C. FRANCISCO, a citizen of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented new and useful Improvements in Core-Making Machines, of which the following is a specification.

This invention relates to machines for making cores for metallic castings and the objects thereof are to provide a machine which will form cores of any reasonable cross-sectional configuration in continuous lengths, complete, ready for the baking oven.

A further object is to so construct the device that in the formation of cores suitable vent openings may be provided therein to permit of the same being readily dried in an oven and also to permit the escape of gases generated by the molten metal used in the mold in which said cores are employed.

A still further object is to make the invention simple in construction, strong, durable and efficient in operation, thereby producing a machine in which the number of parts are reduced to a minimum while a high degree of efficiency is obtained.

Other advantages constituting objects of this invention will more fully appear in the subjoined description.

A practical embodiment of this invention is illustrated in the accompanying drawings in which similar reference numerals indicate like parts in the different figures.

In the drawings, Figure 1 is a plan view of my improved machine; Fig. 2 is a side elevation looking from the right of Fig. 1; Fig. 3 is a longitudinal sectional view of a portion of the same; and, Fig. 4 a section on line X of Fig. 1.

Specifically describing the device illustrated in the drawings, 1 denotes a bed-plate provided with an upturned integral side flange 2. Mounted on the bed-plate 1 are a pair of upright brackets 3 each provided at its upper end with journal bearings 4, 4, in which is mounted a rotatable shaft 5 having on one end thereof a pulley 6 designed to receive a belt by which motion is communicated to the shaft. To the opposite end of the shaft 5 is fixedly secured a crank 7 provided with an ordinary wrist-pin on which is journaled one end of a connecting rod 8 held against lateral movement thereon by means of a cap 9. The opposite end of the connecting rod 8 is pivoted on a trans-

verse shaft 10 mounted in a carriage 11. The bed-plate 1 is provided with a plurality of upwardly-extending integral posts 12, 13, 14 and 15 arranged in pairs on opposite sides of the carriage 11. Fixedly secured on the posts 12 and 13 and extending therebetween and also between the posts 14 and 15 are a pair of bars 16 parallel with each other and constituting ways for the carriage 11. The carriage 11 has a rabbet cut in each side edge thereof to receive the bars 16 for permitting reciprocal motion thereof. The carriage 11 is provided with an upwardly-extending face 17 to which is secured by means of bolts 18 a member 19 provided near its central portion with a socket 20 adapted to receive the reduced end 21 of a plunger 22 detachably secured therein by means of a set screw 23.

To the outer faces of the posts 12 and 15 of the bed-plate 1 is secured a hopper 25 provided with a lateral flange 26 through which bolts 24 extend for securing the device in position. The hopper 25 consists of an upwardly-extending portion 27 and a laterally-extended sleeve 28 adapted to receive a tubular member 29 frictionally secured therein. The tubular member 29 constitutes a mold within which the continuous core is formed and preferably consists of a section of steel tubing held fixedly in the sleeve 28.

Secured to the outer faces of the bars 16 are a pair of upright posts 30 adapted to constitute guides for a pair of vertically-movable cross-bars 31 which are held from lateral movement thereby. Extending downwardly between the cross-bars 31 are a plurality of bolts 32 the lower ends of which engage a bar 33 preferably arranged parallel with the bars 31. The bar 33 is preferably transversely grooved to receive the rear end of a mandrel 34 which is arranged to be held fixedly in position by being clamped between the bars 31 and 33 by the action of the bolts 32. This mandrel 34 extends through the upwardly-extending portion 17 of the carriage and through an opening in the plunger 22 and into the mold forming member 29. The mandrel 34 is adapted to form a central opening in the core during the process of manufacture either to permit of the insertion of a rod through the finished core or to allow the escape of gases formed in the core by the molten metal in the mold in which the core is employed. Experience

has demonstrated that it is frequently advisable to form other openings in a core, especially if the same is one of considerable diameter, and in order to accomplish this result a plurality of openings are drilled in the end of the plunger 22 in each of which is mounted vent-forming wires 35 held in position by means of set screws 36 engaging the inner ends of the wires 35. It has been demonstrated that in using the above-described machine, especially if the same is constructed of metal, that the end of the plunger 22 will form the core in the mold member 29 with considerably greater efficiency if the end of the plunger 22 is provided with a recess 37 the object of which is to contain a quantity of the core mixture to prevent the metal of the plunger coming in contact with the material of which the cores are being made. By this is meant, that after the first movement of the plunger against the core material the recess 37 will become filled with a plug of this material which will harden in place and offer a means for preventing the end of the plunger 22 coming in direct contact with the sand from which the cores are thereafter constructed. It is intended that the plug or core material in the depression 37 will remain there until worn away, no matter how long the machine is operated. It will be obvious that instead of employing one mandrel 34 for forming vent openings in the core, a plurality of such mandrels may be employed and securely held between the bars 31 and 33 so as to extend into the mold member 29 and form a plurality of openings in the finished core instead of a single opening.

The operation of this device is as follows: Power being communicated by means of a belt or otherwise to the pulley 6, it in turn revolves the shaft 5 causing a reciprocal movement of the connecting rod 8 and a corresponding motion of the carriage 11 carrying the plunger 22. This movement of the carriage 11 causes the end of the plunger 22 to reciprocate through the hopper 25 and from thence a short distance into the mold member 29. The motion of the carriage 11 is such that the plunger 22 never completely leaves the hopper 25 but when drawn backward to its fullest extent its front face will be approximately flush with the rear inner face of the hopper 25. Material for making cores is constantly fed into the hopper 25 and is driven thence by means of the action of the plunger 22 into the mold 29 from which it escapes or is driven in a continuous uninterrupted stream, being packed tightly together within the mold member by the action of the plunger. It is well known that the material of which cores for castings are made is a sticky, damp sand and the friction of the same on the inner surface of the mold member 29 is

sufficient to cause it to pass through the member slowly and be compacted therein sufficiently by the action of the plunger to make the same homogeneous and of sufficient stiffness to withstand ordinary handling. After the cores are received from the discharging end of the mold member 29 they are placed upon a suitable tray and are conveyed to a baking oven where they are properly dried for use. It will be noted that cores of different cross-sectional configuration and size may be readily produced from this machine by simply varying the type of mold and plunger employed in the machine and any number of vent holes may be formed within the cores by employing a desirable number of vent wires or mandrels either attached to the plunger 22 or fixedly secured between the clamping bars 31 and 33.

What I claim and desire to secure by Letters Patent, is:—

1. A device of the class described comprising in combination a frame provided with an upturned end and further provided with upwardly-extending lugs, bars constituting guides mounted on said lugs and said upturned end of said frame, a reciprocally-acting carriage on said guides, said carriage provided with an upturned face, a member provided with a socket detachably secured to said face, a plunger adjustably secured in said socket, a hopper mounted on the upturned end of said frame provided with a lateral opening to receive said plunger, a tubular member on the opposite side of said hopper to receive material driven by said plunger, clamping means mounted on said guides, a mandrel held by said clamping means extending through said plunger and into said tubular member, and means for reciprocating said carriage.

2. A device of the class described comprising in combination a frame provided with an upturned end and further provided with upwardly-extending lugs, bars constituting guides mounted on said lugs and said upturned end of said frame, a reciprocally-acting carriage on said guides, said carriage provided with an upturned face, a member provided with a socket detachably secured to said face, a plunger adjustably secured in said socket, a hopper mounted on the upturned end of said frame provided with a lateral opening to receive said plunger, a tubular member on the opposite side of said hopper to receive material driven by said plunger, upwardly-extending posts on said bars, a vertically-shiftable horizontal cross bar extended between said posts and guided thereby, clamping means carried by said cross bar, a mandrel held by said clamps extending through said plunger and into said tubular member and means for reciprocating said carriage.

3. A device of the class described com-

prising in combination a frame provided with an upturned end and further provided with upwardly-extending lugs, bars constituting guides mounted on said lugs and said
 5 upturned end of said frame, a hopper mounted on said upturned end provided with a lateral opening to receive a plunger, a reciprocally-acting carriage on said guides, said carriage provided with an upturned
 10 face, a member provided with a socket detachably secured to said face, a plunger adjustably secured in said socket, the front face of said plunger provided with a recess adapted to be filled with a material fed to
 15 said hopper for constituting an insulating member for said plunger for preventing adhesion between said plunger and the material to be compacted thereby, a tubular member on the opposite side of said hopper to receive material driven from said hopper by
 20 said plunger, upwardly-extending posts on said bars, a vertically-shiftable horizontal cross-bar extended between said posts and guided thereby, clamping means carried by
 25 said cross-bar, mandrels held by said clamping means extending through said plunger and said recess into said tubular member, and means for reciprocating said carriage.

4. A device of the class described comprising in combination a frame provided with an upturned end and further provided with upwardly-extending lugs, bars constituting guides mounted on said lugs and

said upturned end of said frame, a hopper mounted in said upturned end provided 35 with a lateral opening to receive a plunger, a reciprocally-acting carriage on said guides, said carriage provided with an upturned face, a member provided with a socket detachably secured to said face, a plunger adjustably secured in said socket, the front 40 face of said plunger provided with a recess adapted to be filled with a material fed to said hopper for constituting an insulating member for said plunger for preventing adhesion between said plunger and the material 45 to be compacted thereby, a vent-forming-wire mounted in said recess, a tubular member on the opposite side of said hopper to receive material driven from said hopper 50 by said plunger, upwardly-extending posts on said bars, a vertically-shiftable horizontal cross-bar extended between said posts and guided thereby, clamping means carried by said cross-bar, mandrels held by 55 said clamping means extending through said plunger and said recess into said tubular member, and means for reciprocating said carriage.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FRED C. FRANCISCO.

Witnesses:

F. H. STUART,
C. E. HUMPHREY.