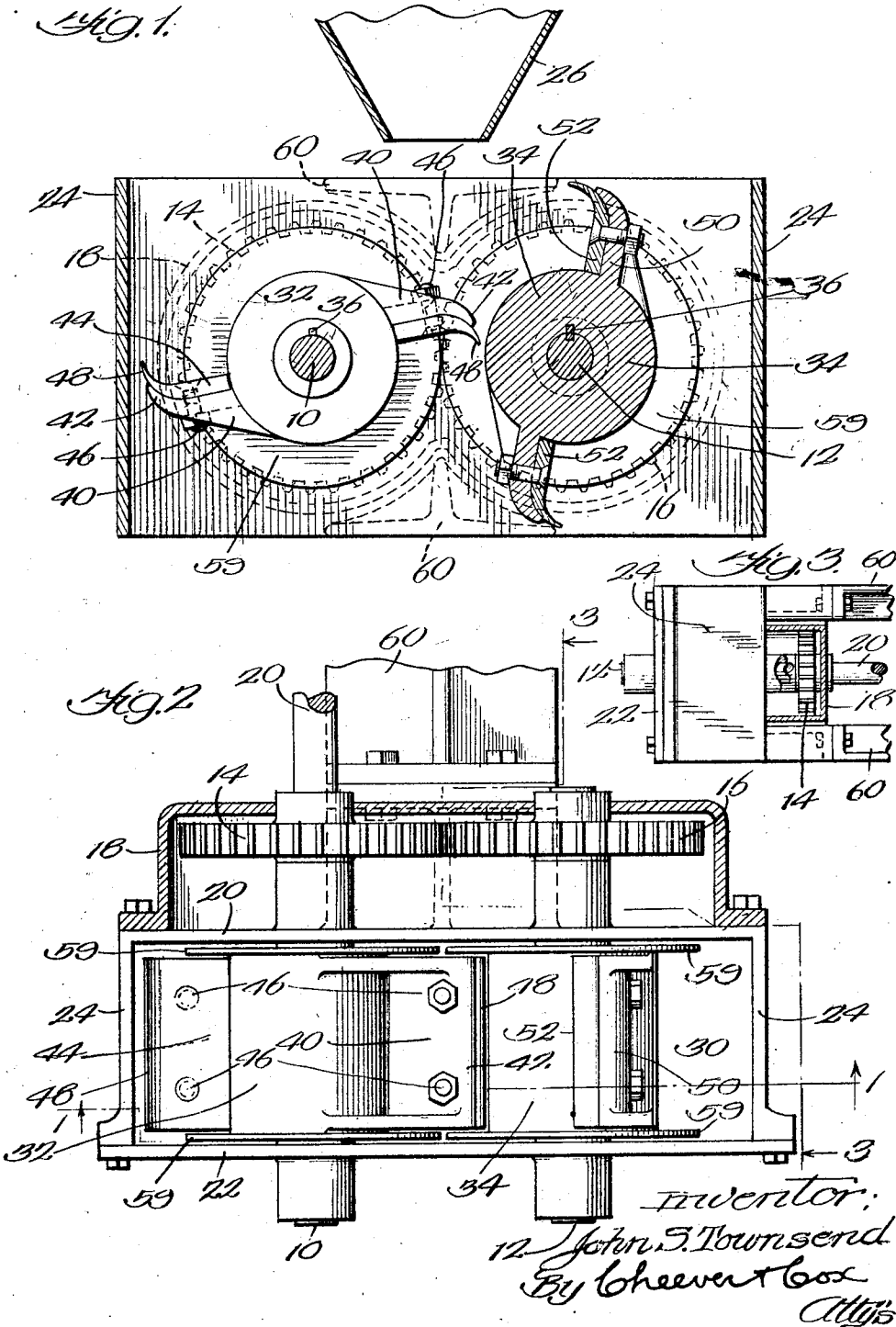


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J. S. TOWNSEND  
SAND RAMMING MACHINE  
Filed April 7, 1920



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# UNITED STATES PATENT OFFICE.

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## SAND-RAMMING MACHINE.

Application filed April 7, 1920. Serial No. 371,799.

*To all whom it may concern:*

Be it known that I, JOHN S. TOWNSEND, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sand-Ramming Machines, of which the following is a specification.

This invention relates to mechanical molding machines, i. e., machines for throwing sand into a mold about a pattern from which a casting is to be made, and doing this so thoroughly and efficiently that hand tamping or other manipulation of the mold is not required.

The object of this invention is to provide a machine for taking sand from a stream flowing under the action of gravity, form it into wads of sand suitable for molding purposes and projecting said wads into the mold box, or the like at a speed greater than that of gravity without the sand particles touching any stationary surfaces, i. e., anything tending to retard or stop their motion.

The invention consists in a set of rotatable blades so placed and arranged as to carry out the foregoing objects and to do this in a satisfactory and efficient manner, both as to the construction and the operation of the machine, and the results produced. The invention further consists in features and details of construction hereafter more fully set forth in the specification and claims.

Referring to the drawings in which similar numerals represent the same parts throughout the several views,

Figure 1 is a side view of mechanism illustrating this invention in its preferred form, certain parts being shown in section on line 1—1 of Figure 2.

Figure 2 is a plan view of the entire mechanism including the parts of Figure 1.

Figure 3 is a reduced size partially sectional view on the line 3—3, Figure 2.

In carrying out this invention two parallel shafts 10 and 12 are provided carrying intermeshing gears 14 and 16 so mounted within a case 18 that when power is applied to the extending end 20 of one of the shafts as 10, the two shafts are driven at equal speed in the opposite direction. The free ends of the shafts 10 and 12 which appear below the gears 14 and 16 in Figure 2 are carried thru and journaled in the spaced apart parallel side walls 20 and 22 of a rec-

tangular casing whose ends are 24. This casing is open top and bottom so that sand delivered by a chute 26 above its center can, except as hereafter noted, pass freely thru the passage 30 of the casing to mold boxes (not shown) located below the passage 30. Onto the portions of shafts 10 and 12 which are inside the case are cylindrical drums or hubs 32 and 34 secured in place by any suitable means, as for instance keys 36. On the drum 32 are one or more, in the particular case here illustrated two, projecting arms 40, preferably with circumferentially turned points 42 pointing in the direction of rotation of the drum. To each of these arms 40 is secured, if desired, a supplemental working face 44 adapted to be detachably secured in place by any suitable means as for instance the bolts 46. The function of this supplemental member 44 is merely to provide a removable working face for the arm 40 which can be changed as often as wear takes place. Each member 44 is provided with a curve point 48 turned in the direction of rotation of the adjacent drum 32. Except for this curved point 48 the sand engaging face of each member 44 is radial to the drum to which it is attached. Because of this construction the fingers act positively on the sand they have to engage and speed up.

These members 40 and 44 have their points 42 and 48 at such distance from the central axis of the shaft 10 that as the shafts rotate these points will just clear the circumference of the adjacent drum 34.

The opposite drum 34 is provided with projecting arms or fingers 50 equipped with supplemental fingers 52 corresponding in construction and function to the members 40 and 44 on the first mentioned drum 32, the only difference between the two devices being that, when parts are assembled, as shown in the drawing, the fingers on the opposite drums interfit with each other as rotation of the shafts 10 and 12 takes place.

The source of power applied to the end 20 of shaft 10 is such that the circumferential speed of the fingers 40—44 and 50—52 is substantially greater than the velocity of sand falling from the hopper 20 under the action of gravity and passing between the drums 32 and 34. The result of this construction is that as a finger on either drum passes the central vertical line between shafts 10 and 12 it scoops out of the down-

wardly flowing body of sand a quantity of moving sand, gathers it together, and drives it in a wad or gob downward to the mold box at a greater speed than the gravity flowing sand following it. The fingers on the opposite drums are designed to be sufficiently close together so that as they follow one after the other they successively gather up each successive portion of sand which is falling from the hopper 26. In other words there is no sand falling by gravity which gets thru the rotating fingers without being caught by them and having its speed accelerated.

Sand passing between the drums is retained against lateral escape and against retardation by striking against walls 20 and 22 by flanges or washers 59 at the ends of the drums rotating with them.

The result of the construction shown and described is that any sand which one passing finger tends to direct laterally of the downward path of travel is in fact caught by the next finger on the opposite drum with the result that in practice the sand always travels, as desired, in wads delivered at high speed along the central vertical line between the axes of the shafts 10 and 12.

The parts described, taken together, constitute a sand throwing head, and are carried on an arm 60 mounted in any desired manner for movement about the foundry.

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

1. In mechanism of the class described, in combination with a suitable passage, open at its top and bottom, and a chute for delivering sand at a given speed, through said passage a pair of rotatable drums in said passage on opposite sides of the path of travel of the sand through the passage intermeshing fingers on the drums each having a sand engaging face extending substantially radially from its adjacent drum adapted when the drums are rotated to collect quantities of sand from the stream of sand going thru the passage and means for rotating said drums at a sufficiently high speed so that said fingers travel faster than the sand moving thru said passage and successively collect portions of said sand into wads and deliver it from the bottom of said passage at a speed greater than the entering speed of the sand.

2. In mechanism of the class described, a pair of rotatable drums placed parallel to each other and spaced apart from each other, intermeshing fingers on said drums each having a sand engaging face extending substantially radially from its adjacent drum, flanges or washers on the drums closing the openings at the ends of the drums affording a vertical passage from top to bottom thru and between said drums and said

fingers, means supplying sand above said passage between the drums where it tends to fall between the drums, and means for rotating said drums and attached fingers at a sufficiently high speed so that the fingers on the drums gather sand falling between them into wads which are delivered at accelerated speed from the bottom of said passage.

3. In mechanism of the class described, in combination with a suitable passage, open at its top and bottom, and a chute for delivering sand at a given speed through said passage, a pair of rotatable drums in said passage on opposite sides of the path of travel of the sand through the passage intermeshing fingers extending radially from the circumferences of said drums, curved at their ends to point in the direction of rotation of the drums adapted when the drums are rotated to collect quantities of sand from the stream of sand going thru the passage and means for rotating said drums at a sufficiently high speed so that said fingers travel faster than the sand moving thru said passage and successively collect portions of said sand into wads and deliver it from the bottom of said passage at a speed greater than the entering speed of the sand.

4. In mechanism of the class described, a pair of rotatable drums placed parallel to each other and spaced apart from each other, intermeshing fingers extending radially from the circumferences of said drums, curved at their ends to point in the direction of rotation of said drums, flanges or washers on the drums closing the openings at the ends of the drums affording a vertical passage from top to bottom thru and between said drums and said fingers, means supplying sand above said passage between the drums where it tends to fall between the drums, and means for rotating said drums and attached fingers at a sufficiently high speed so that the fingers on the drums gather sand falling between them into wads which are delivered at accelerated speed from the bottom of said passage.

5. In mechanism of the class described, in combination with a suitable passage, open at its top and bottom, and a chute for delivering sand at a given speed through said passage, a pair of rotatable drums in said passage on opposite sides of the path of travel of the sand through the passage intermeshing readily detachable fingers extending radially from the circumferences of said drums, curved at their ends to point in the direction of rotation of the drums adapted when the drums are rotated to collect quantities of sand from the stream of sand going thru the passage and means for rotating said drums at a sufficiently high speed so that said fingers travel faster than the sand moving thru said passage and

successively collect portions of said sand into wads and deliver it from the bottom of said passage at a speed greater than the entering speed of the sand.

6. In mechanism of the class described, a pair of rotatable drums placed parallel to each other and spaced apart from each other, intermeshing readily detachable fingers extending radially from the circumferences of said drums, curved at their ends to point in the direction of rotation of said drums, flanges or washers on the drums closing the openings at the ends of the drums affording a vertical passage from top to bottom

thru and between said drums and said fingers, means supplying sand above said passage between the drums where it tends to fall between the drums, and means for rotating said drums and attached fingers at a sufficiently high speed so that the fingers on the drums gather sand falling between them into wads which are delivered at accelerated speed from the bottom of said passage.

In witness whereof, I have hereunto subscribed my name.

JOHN S. TOWNSEND.