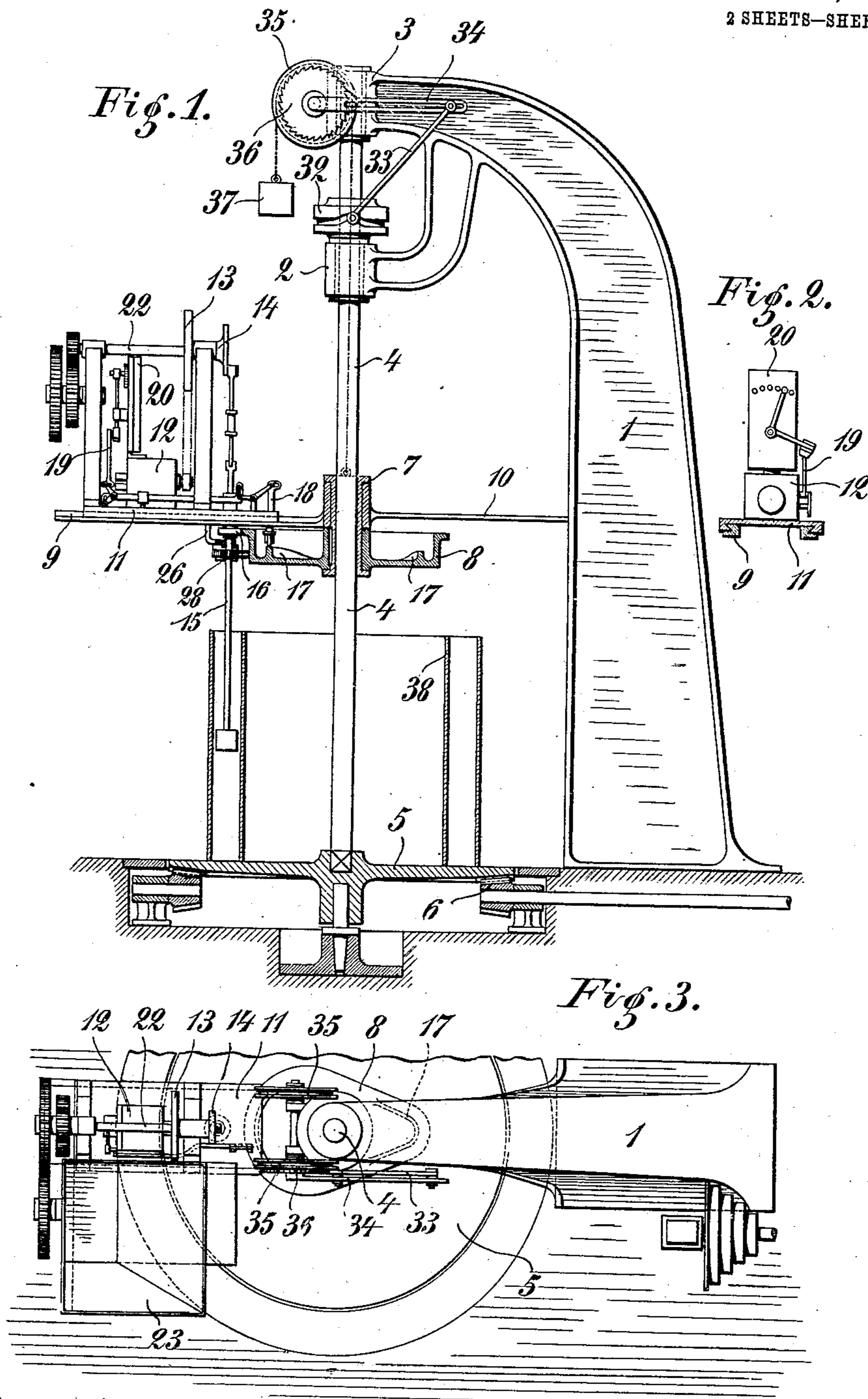


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PIPE MAKING MACHINE.
APPLICATION FILED JULY 18, 1908.

914,851.

Patented Mar. 9, 1909.

2 SHEETS—SHEET 1.



Witnesses:
H. R. Schulz.
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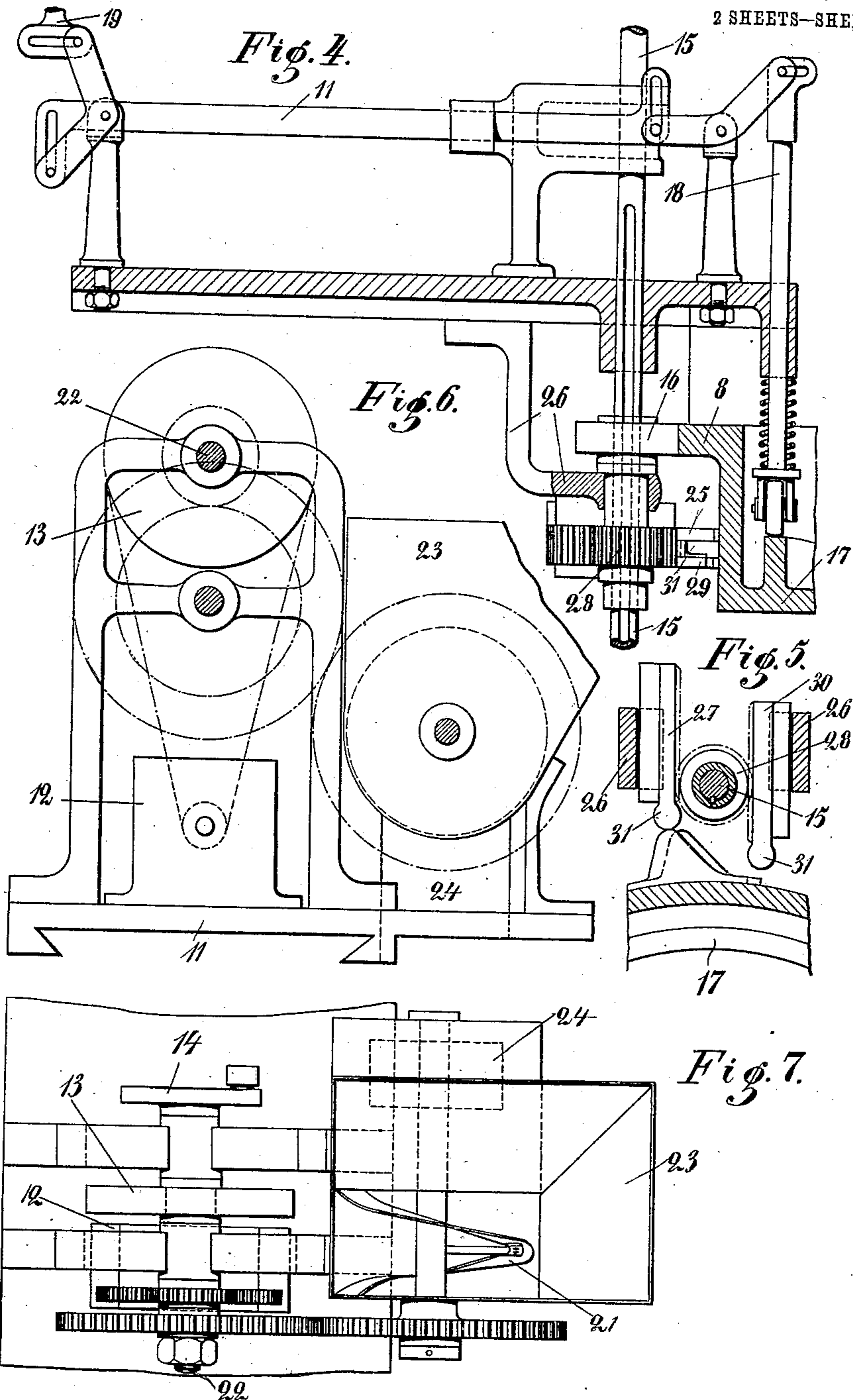
Inventor:
W. Langenheim
by his attorney
Frank V. Fieser

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UNITED STATES PATENT OFFICE.

WILHELM LANGENHEIM, OF DUISBURG-HOCHFELD, GERMANY.

PIPE-MAKING MACHINE.

No. 914,851.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed July 18, 1908. Serial No. 444,301.

To all whom it may concern:

Be it known that I, WILHELM LANGENHEIM, a citizen of Germany, residing at Duisburg-Hochfeld, Germany, have invented 5 new and useful Improvements in Pipe-Making Machines, of which the following is a specification.

The present invention relates to a pipe making machine for the manufacture of hard 10 stamped pipes, even all over, and of any desired section, from cement, concrete, molding sand and similar material. The absolutely even hard stamping is of the utmost importance for the applicability and dura- 15 bility of such a pipe; nevertheless, this was only possible for pipes of circular ring-shaped section with the hitherto known systems of machines. For pipes having walls of unequal thickness, an even hard stamping of 20 varying intensity for different sizes of pipes can only be attained if (1.) the stamp support after stamping a layer of material to be molded, is raised by a certain amount, the size of which can be proportioned differently 25 for each size of pipe, (2.) if the action of the stamp per unit of surface remains the same at all points of the pipe, (3.) if the feeding in of the material remains the same per unit of sectional surface, thus if at points having a 30 greater section, more material is led in. Up to the present there exists no machine which fulfils all three of these conditions, the co-operation of which is necessary in order to produce an evenly hard stamped pipe.

35 For (1) arrangements are already known in which the stamping mechanism at each revolution of the threaded center shaft of the stamp-mill is raised the height of the thread. The amount by which the stamp mechanism 40 is lifted is, therefore, the same at each revolution of the center shaft, and has the same effect, whatever diameter the pipes have. In the arrangement shown, however, it is 45 possible, by adjusting the point of application of the lifting rod, to increase the lift of the stamping mill to any amount with pipes having thin walls, so that the height of the layer can be increased and the pipe is not stamped unnecessarily or injuriously hard, 50 whereas for pipes having thick walls the apparatus can be regulated in inverse sense.

For (2) an even specific stamping action at all points of the pipe is obtained with the present invention owing to the fact that at 55 points where the pipe is thicker, the number of blows of the stamping device is increased

corresponding to the increase in the thickness of the walls; this is done in the case of electrically driven stamp-work by regulating the resistance, and for pneumatically or hy- 60 draulically driven stamps work by regulating the air- or water inlet, and thus at the points where the pipe walls are thicker an increased or decreased rotation of the stamps takes place, corresponding to the increase in the 65 thickness of the pipe walls, this being done by a rotating disk provided with projecting pieces, which so turns the stamp rod that the stamp, which has an oblong or oval form, is turned lengthwise or squarely and obliquely 70 respectively, so that it consequently deals with a narrower or wider space.

For (3) the material feeding apparatus in the example shown is placed on the stamp slide and consists of a transport worm gear 75 and feeding funnel which must always be kept full when stamping. Driving is done by the engine through gearing, the ratio of which can be changed according to the size of the pipes. As, however, the engine during 80 one revolution, alters its speed to correspond to the thickness of the pipe wall, the speed of the feeding worm gear is altered in the same ratio, and thus at such points, where the section of the pipe is greater, more material will 85 be fed in.

In the accompanying drawings: Figure 1 is a side elevation, partly in section, of my improved pipe making machine; Fig. 2 a face view of the electric speed regulator and 90 adjoining parts; Fig. 3 a plan, partly broken away, of Fig. 1; Fig. 4 a detail of the mechanism for operating the speed regulator; Fig. 5 a horizontal section through the means for rotating the stamper; Fig. 6 an enlarged 95 front view of the hopper and adjoining parts, and Fig. 7 a plan of Fig. 6.

The machine consists of a vertical support 1, which has two bearings 2 and 3 guiding a shaft 4, which is driven from a rotating disk 5 100 placed at the foot of the support 1. This disk is made to rotate by a cogged racer joined by casting and a conical pinion 6, which is driven by an intermediate gearing having a step pulley, and thus allows a choice 105 of speed for the disk 5 suitable for all sizes of pipes.

The shaft 4 is slotted longitudinally, the bush 7 takes part in rotation, also the interchangeable templet 8, corresponding to the 110 shape of the pipe just being stamped. The stamp projecting arm 9 is, on the other hand,

prevented from rotating by the stop 10. It carries the stamp slide 11, which can be displaced on the projecting arm 9, and on which is mounted the stamp mechanism, which is shown electrically driven in the drawing. The engine 12 transmits the rotation to the pulley 13, and by means of the crank disk 14 and the rod with the intermediate spring, the stamp rod 15 is moved up and down. The stamp slide 11 is pressed against the templet 8 in the usual manner by a spring or a weight with a roll 16 as shown in Fig. 4, and thus guided corresponding to the shape of pipe. On the templet 8 are ribs 17, the actual height of which represents according to a given scale by what amount the thickness of the pipe wall exceeds the minimum at corresponding parts of the pipe. By spring pressure the rod 18, provided with a roller, is pressed against this rib, and the up- and down movement of the rod 18 is transmitted through a lever to the draw rod 19 which is connected to the lever switch of the resistance or speed regulator 20 shown in Figs. 1 and 2. At a turn of the shaft 4 and with it of the templet 8 the resistance will thus be regulated to exactly correspond to the alteration in the wall thickness, and the speed of the engine and with it the number of blows of the stamp adjust themselves exactly to the alterations in the wall thickness of the pipe. The adjustment of the material feed to the alteration in the thickness of the pipe walls is attained by the form of construction shown in Figs. 6 and 7, by the driving of a mortar worm gear 21 through partly interchangeable tooth wheels from the crank disk shaft 22, which is dependent on the varying speed of the engine 12. The worm gear or feed spiral 21 is equipped with a large filling funnel 23 which must always be kept full by the workman, so that at each revolution of the worm gear the same quantity of mortar is introduced into the mold through the outlet slot 24. The same purpose, namely the adjustment of the mortar feed to the varying wall thickness, can of course be attained in other ways, for example by the opening and closing of the valve, by means of a lever mechanism driven from the rib 17. The valve would then represent the closing arrangement of a mortar receptacle against the mold. As already mentioned, the stamp, of oblong or oval form, will be adjusted lengthwise, obliquely or square, according to the width of the form. The disk 8 serves to turn the stamp rod with the stamp; this disk is provided with two rows of stops or projections 25 and 29.

The projections 25 of one row operate on the toothed bar 27, and the other projections 29 on another toothed bar 30, which are guided in the holder 26 and which at the opposite sides engage with a spur wheel 28, which is fixed on the stamp rod 15 with a spring and slot. At the points at which the stamp should be turned obliquely or squarely, one of the projections meets the rounded end 31 of the toothed bar 27, and at those points at which the mold again becomes narrow, one of the projections 29 meets the end 31 of the other toothed bar 30, so that the stamp again rotates in the longitudinal direction. By the forward movement of one toothed bar, the other will be moved back by the spur wheel itself. The lifting disk 32, as shown in Fig. 1, is placed above the bearing 2, and it takes part in the rotation of the shaft 4. The draw rod 33 engages with a pivot in the slot of the lifting disk, whereas the other end of the rod can be rigidly fixed to a desired point of the lever 34. By means of the pawl fixed to the lever 34, the ratchet wheel 36 placed on the chain wheel 35 will be carried forward a given distance at each revolution of the shaft 4. As the bush 7 and with it the stamp slide carrier 9 and the templet 8 are suspended on chains running over the tooth chain wheels 3, the stamp slide 11 and accessories are also raised with a guided motion. The weight 37 serves the purpose of partly balancing the weight of the stamp slide and accessories. After the pipe has been finished the shaft 4 with the pipe core 38 attached to it, is drawn out.

I claim:—

1. In a pipe making machine, a stamper, means for vertically reciprocating the same, means for gradually raising said stamper and reciprocating means, a feed spiral, and means for simultaneously adjusting the speed of the stamper reciprocating means and of the feed spiral, substantially as specified.

2. In a pipe making machine, a stamper, means for vertically reciprocating the same, means for gradually raising said stamper and reciprocating means, a feed spiral, means for simultaneously adjusting the speed of the stamper reciprocating means and of the feed spiral, and means for rotating the stamper, substantially as specified.

Signed by me at Barmen, Germany, this 7th day of July 1908.

WILHELM LANGENHEIM. [L. s.]

Witnesses:

OTTO KÖNIG,
WILH. BERNSAU,