March 10, 1964 R. MIČIAN 3,124,234

PROGRAMME-CONTROLLED AUTOMATIC CASTING AND MATURING FIELD FOR GAS SILICATE MANUFACTURING PLANTS

Filed Feb. 1, 1961 3 Sheets-Sheet 1

Fig. 1.

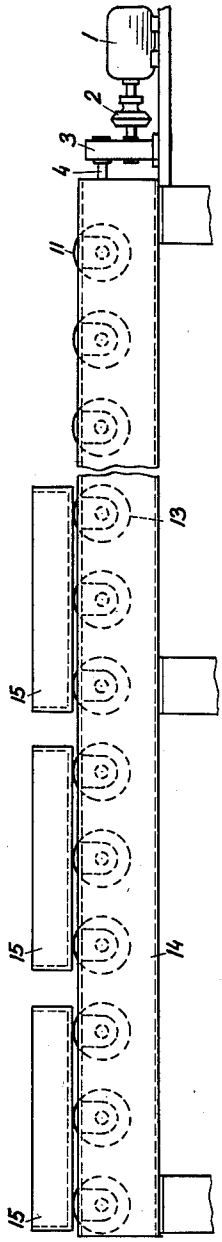


Fig. 3.

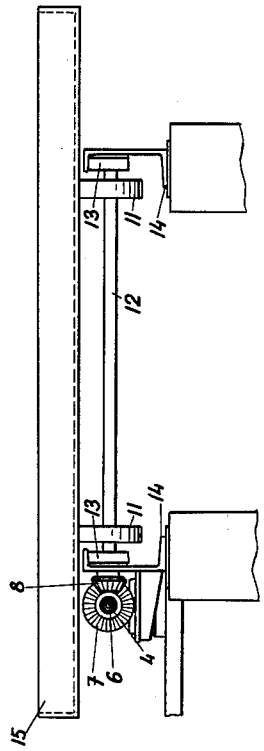
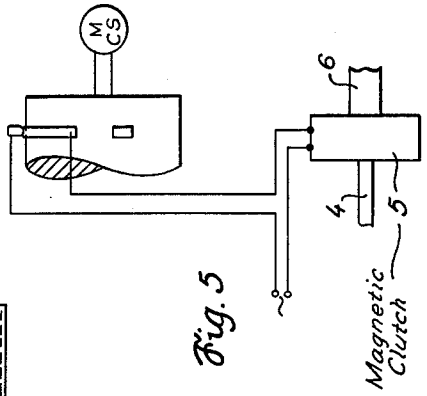


Fig. 5



INVENTOR.
Rudolf Mičian
BY
Roland Land
agt

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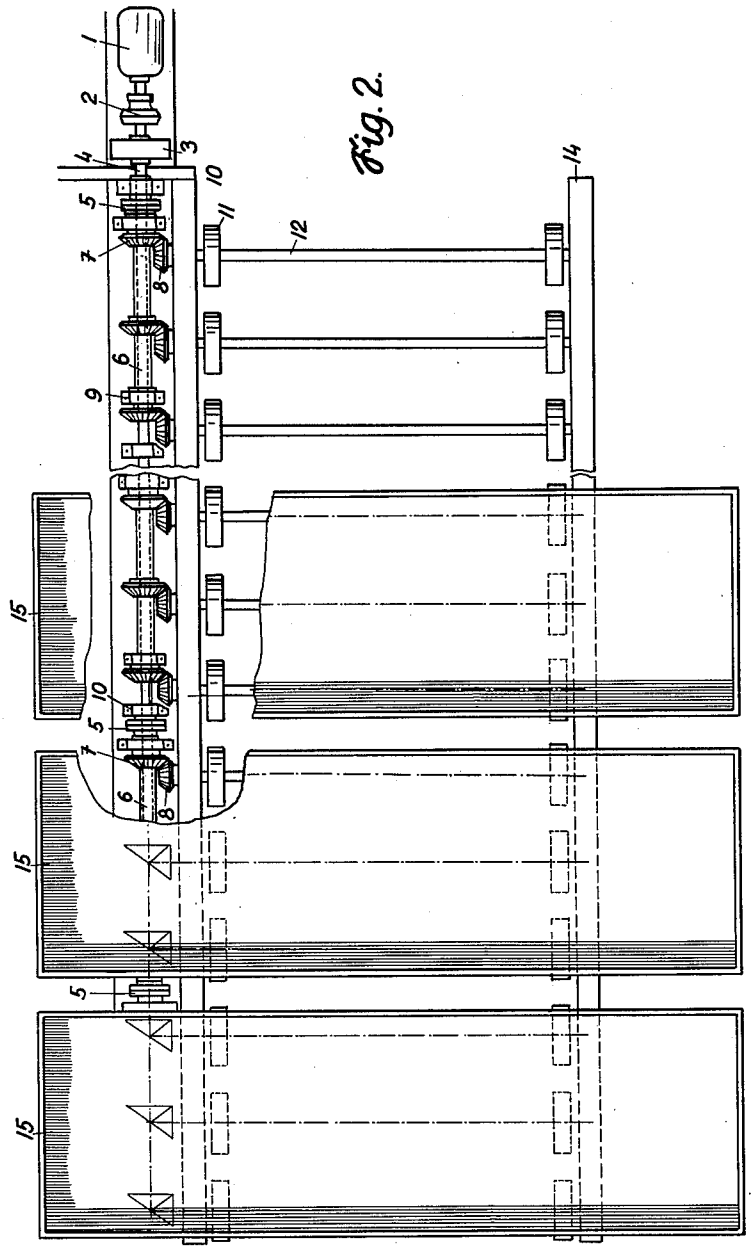


Fig. 2.

INVENTOR.
Rudolf Mičian
BY
Richard Good
agt

March 10, 1964 R. MIČIAN 3,124,234

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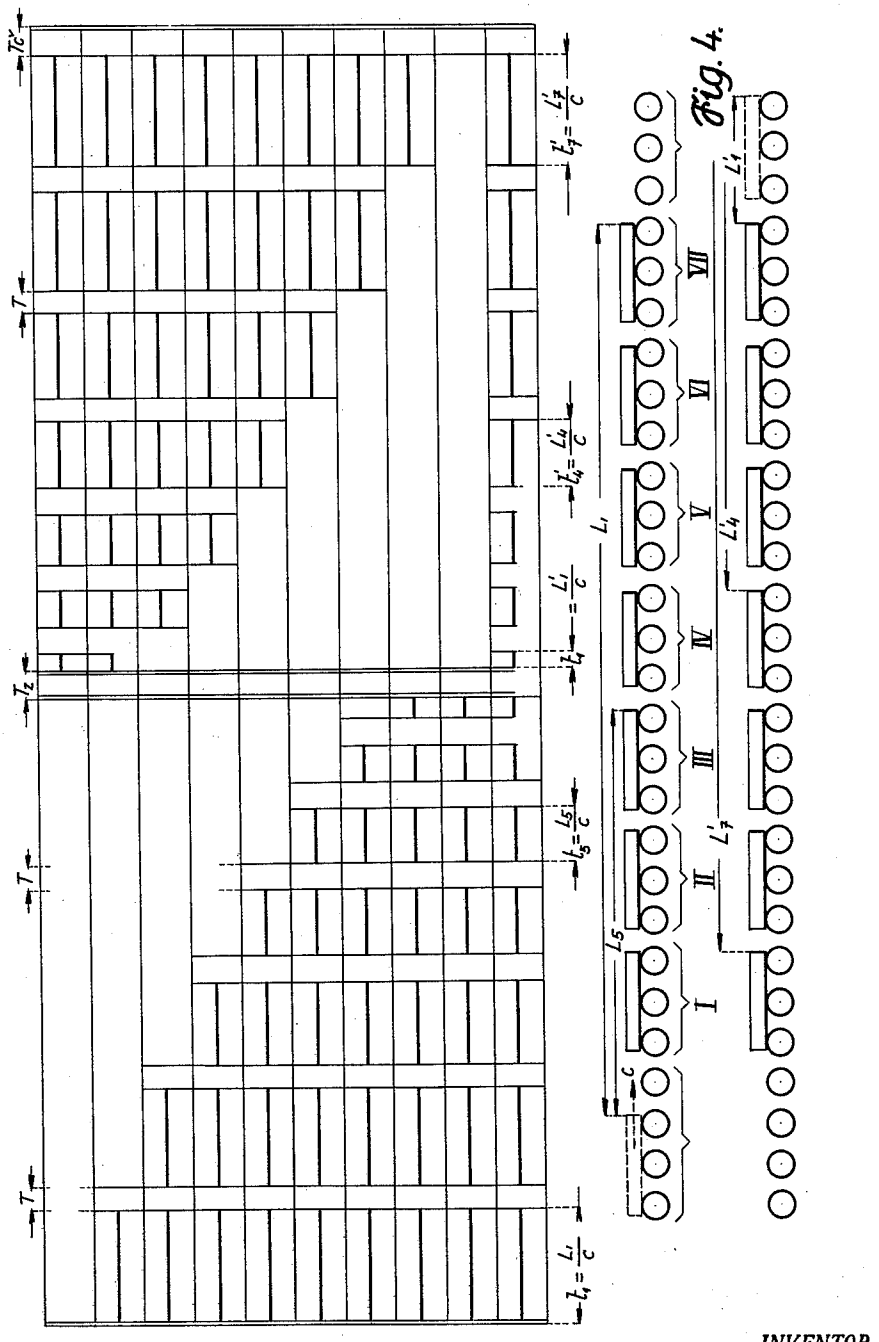


Fig. 4.

INVENTOR.
Rudolf Mičian
BY
Richard Good
Agt

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3,124,234

PROGRAMME-CONTROLLED AUTOMATIC CASTING AND MATURING FIELD FOR GAS SILICATE MANUFACTURING PLANTS

Rudolf Mičian, 120 Slezska, Prague 2, Czechoslovakia

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4 Claims. (Cl. 198—127)

The present invention relates to a programme-controlled automatic casting and maturing field for gas silicate building blocks and the like.

Known casting and maturing field for gas silicate manufacturing plants are equipped with cranes and transfer tables, or fields formed by trucks movable on a rail-system and are not suitable for automation. The manipulation of the molds involves numerous operations which cannot readily be automatized if at all. The conventional fields require multiple movements of the heavy and bulky, but relatively delicate molds. They need large factory halls and heavy cranes. The handling of the molds often cause damage to the matured material, one of the major difficulties in the manufacture of large gas-concrete building blocks.

In the commonly assigned copending patent application Serial Number 69,746, a casting and maturing field for gas silicate manufacturing plants has been described in which roller tracks are arranged in the space above the autoclaves. The molds filled at the start of the track are shifted by means of tow-ropes and winches along the roller track to a place where they are left to mature. They are then conveyed in the same way along the same roller track a cutting table at the end of the roller track. A casting and maturing field of this type is capable of automatic operation in the control cycle of a fully automatic gas silicate manufacturing plant.

It is the object of the present invention to provide an automatic casting and maturing field for gas silicate manufacturing plants.

According to the primary feature of the invention the paired rollers which form the casting and maturing field are combined into jointly driven groups automatically operated in such a way that the molds filled on a filling table—at the start of the roller track are automatically shifted to places on the roller track where they are left to mature. After maturing they are automatically conveyed to the cutting table at the end of the roller track.

The intervals between the movements of each mold are controlled independently by a program source of the casting and maturing field. The casting and maturing field according to the invention may thereby be synchronized with the automatic control cycle of the whole plant and adapted to operating conditions, to varying output and the like. The maturing period may be controlled according to the automatic cycle of the manufacturing plant and is independent of the program source of the maturing field itself.

The program source for a casting and maturing field according to the invention may consist of a rotary drum, switch or the like.

A casting and maturing field according to the invention is shown in the accompanying drawings, wherein:

FIG. 1 is an elevational view of an automatic casting and maturing field according to the invention formed by a roller track;

FIG. 2 shows the field of FIG. 1 in plan view;

FIG. 3 is a side view of the field of FIG. 1;

FIG. 4 is a diagrammatic view of the programming device of the casting and maturing field; and

FIG. 5 is a wiring diagram of the connection between

the programming device of FIG. 4 and the drive of the roller track of FIGS. 1 to 3.

A motor 1 is connected by a hydraulic clutch 2 and a gear transmission 3 with a driving shaft 4 which extends along the entire length of the roller track and is journalled in bearings 10. The driving shaft 4 is keyed to the longitudinally spaced driving discs of several electromagnetic clutches 5. The driven discs of the clutches are keyed to respective hollow shafts 6 journalled in bearings 9. The hollow shafts 6 carry bevel gears 7 which mesh with conical pinions 8 for transmitting movement from each hollow shaft 6 to a group of driven rollers 11. Each pair of rollers is mounted on a shaft 12. The shafts 12 are journalled in bearings 13 on a supporting beam 14 of the roller track. One group comprising three pairs of rollers corresponds, according to FIGURES 1 and 2, to the space occupied by one mold 15.

When the first mold is placed on one end of the empty roller track, and when all electromagnetic clutches 5 are engaged, and the motor 1 is started, the mold moves continuously along the track under the action of the motor 1 transmitted by the hydrodynamic clutch 2. When the drive of the roller track is disconnected at the right moment, the mold comes to a standstill on a predetermined group of rollers connected by a common driving mechanism. During movement of the next mold the process is repeated but the electromagnetic clutch 5 of the roller group occupied by the first mold is not engaged and the movement of the second mold is terminated after a slightly shorter time. In this manner, the entire track may be automatically filled with molds.

By sequentially engaging the electromagnetic clutches, the molds may be shifted after maturing to the other end of the track for the cutting operation.

FIG. 4 shows the essential elements of the program control apparatus for operating selected parts of the casting and maturing field according to the invention in timed sequence. FIG. 4 includes a schematic representation of the developed jacket of the rotatable drum of a control on programming switch. The figure also includes a diagram showing the successive filling of the casting and maturing field with molds, removal of the molds and the cutting operation.

The horizontal heavy lines on the developed periphery of the control drum represent the movable contacts of the switches, not otherwise shown, which actuate the various electromagnetic clutches 5 and the driving motor 1 in timed sequence when the drum is rotated. The length of the lines indicates the duration of their engagement since the drum is rotated at uniform speed by a non-illustrated motor during transport of the various molds. When the non-illustrated collector brushes which constitute the fixed contacts of the program switch enter the gaps between the contacts T, the control drum may be stopped, for instance by switching off a non-illustrated relay, which remains without current and is restarted for instance on an impulse emitted by the central control of the automatic manufacturing plant. The time T denotes the waiting time between the transport of the individual molds along the track. T_z denotes the maturing time, T_c the waiting time for the further successive filling of the field with molds. The intervals T, T_z and T_c are determined for instance by the program control derived from a central drum timing switch of the automatic gas silicate production plant.

What I claim is:

1. A casting and maturing field for gas silicate bodies comprising, in combination,

(*a*) horizontally elongated support means;

(*b*) a plurality of rollers mounted on said support means for rotation about respective longitudinally spaced axes extending transversely of the direction of

elongation of said support means, adjacent ones of said rollers forming a group, and a plurality of groups of said rollers constituting a roller track;

(c) actuating means for actuating rotation of said groups of rollers in timed sequence, said actuating means including

(1) a drive motor,

(2) a plurality of clutch means interposed between said motor and respective ones of said groups, each clutch means being engageable for transmitting movement of said motor to the rollers of the respective group, and

(3) control means for selectively engaging said clutch means at predetermined times.

2. A casting and maturing field for gas silicate bodies comprising, in combination,

(a) horizontally elongated support means;

(b) a plurality of rollers mounted on said support means for rotation about respective longitudinally spaced axes extending transversely of the direction of elongation of said support means, adjacent ones of said rollers forming a group, and a plurality of groups of said rollers constituting a roller track;

(c) actuating means for actuating rotation of said groups of rollers in timed sequence, said actuating means including

(d) driving shaft means extending substantially over the length of said support means;

(e) a plurality of hollow shaft means coaxial with said driving shaft means;

(f) a plurality of clutch means respectively interposed between said driving shaft means and said hollow shaft means for joint rotation of said hollow shaft means with said driving shaft means; and

(g) motion transmitting means connecting each hollow shaft means with a respective group of said rollers for joint rotation.

3. A field as set forth in claim 2, wherein said actuating means further include program means connected to said plurality of clutch means for selectively engaging said one hollow shaft means to said driving shaft means in a timed sequence.

4. A field as set forth in claim 3, wherein said clutch means each include an electromagnetic clutch, and said program means includes contact means in circuit with said clutch for energizing the same in timed sequence.

References Cited in the file of this patent

UNITED STATES PATENTS

1,735,767 Keller et al. ---------- Nov. 12, 1929
2,253,198 Regan ---------- Aug. 19, 1941