Oct. 15, 1929. W. A. K. HARRIS 1,731,896

BLOCK PRINTING MACHINE

Filed June 29, 1926 2 Sheets-Sheet 1

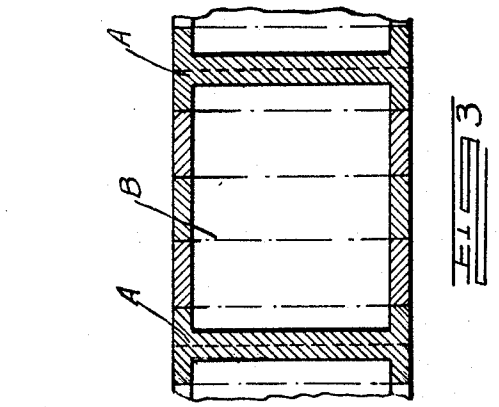


FIG. 3

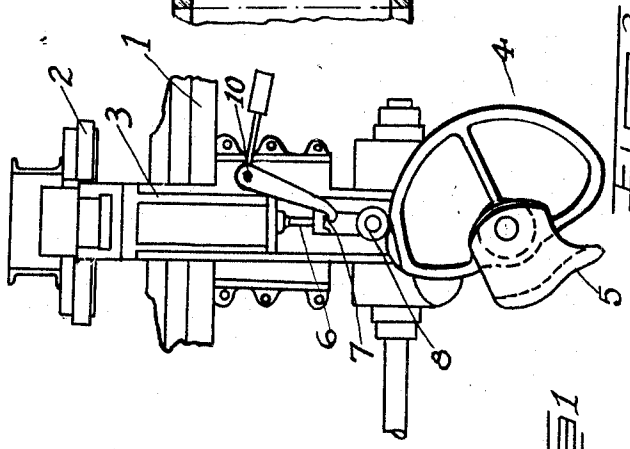


FIG. 2

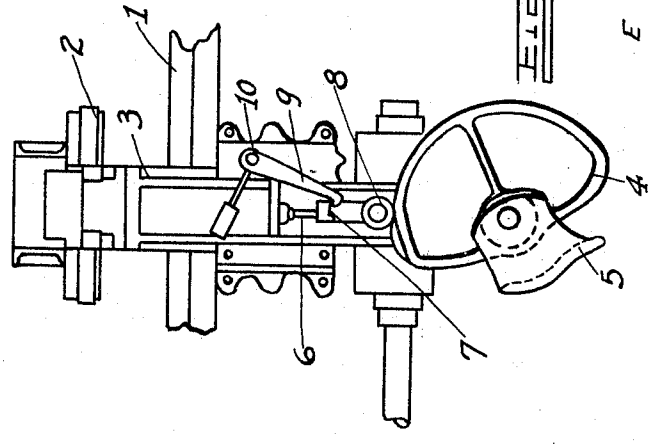


FIG. 1

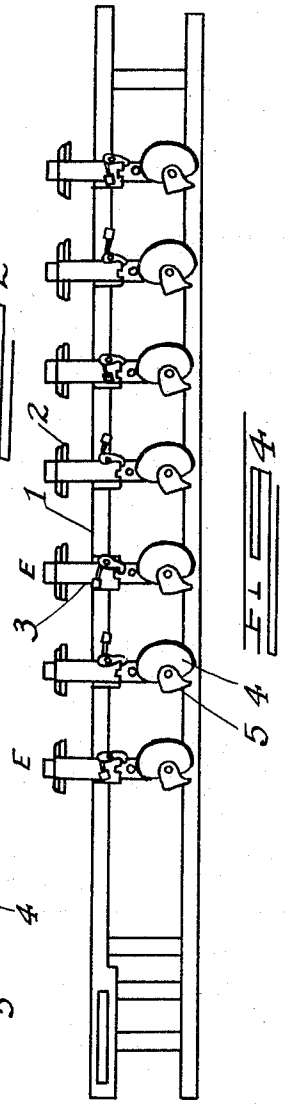


FIG. 4

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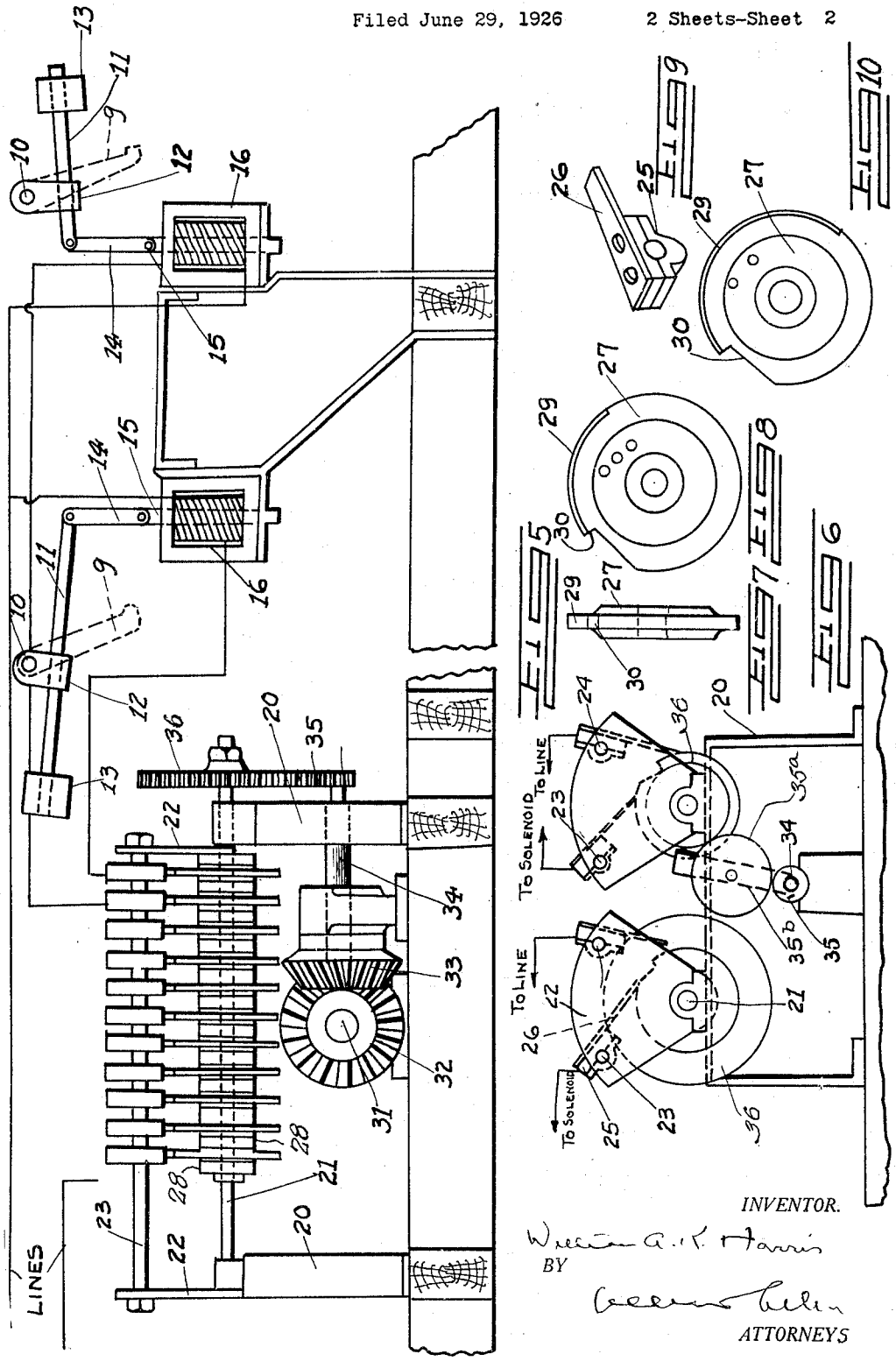
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BLOCK PRINTING MACHINE

Filed June 29, 1926 2 Sheets-Sheet 2



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Patented Oct. 15, 1929 1,731,896

UNITED STATES PATENT OFFICE

WILLIAM A. K. HARRIS, OF CINCINNATI, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CARTHAGE MILLS INCORPORATED, OF CINCINNATI, OHIO, A CORPORATION OF OHIO

BLOCK-PRINTING MACHINE

Application filed June 29, 1926. Serial No. 119,442.

My invention relates to electrical controls for block printing machines such as are used in the printing of designs on a continuous strip of paint surfaced flooring, or in other forms of printing where a closed design or pattern is formed in a series of repeats, requiring an interrupted operation of the printing elements, as applied to the continuous piece moving step by step with relation to them.

It is the object of my invention to provide an electrical control for the blocks of a printing machine of the type noted, which is readily controllable to shift from one length of repeat design to another, and which utilizes the simplest type of operation and mechanism.

There have been a number of machines for printing closed pattern devices, chiefly limited to machines for printing rug repeat designs on a continuous piece of linoleum or asphalt saturated felt. These devices, having been universally, so far as I am advised, mechanical in their timing and operation, have called for expensive installations, hard to keep in proper repair and difficult to adjust for different types of work.

By the use of a master rotary switch, timed to operate with the work feed devices of the press, and solenoids, or electro-magnets for tripping the several print block release devices, I obtain a completely adequate, readily changeable press block control, which can be installed on flat block printing machines with a minimum of expense.

Among other things, it is my object to conserve in operations by applying an automatic latch to those blocks which are used for printing the ends of designs, and releasing this latch when the blocks are to print, whereas, with regard to the blocks which are used to print oftener than they are held out, the latch falls open by gravity and is operated to engage the block operating device, so that the machine will trip the latch and release the block, at any cycle of operation when the latch is not positively held in place during the tripping period.

In the printing of rugs, the end border design blocks, for example, will be held out more than they are held in, and the body design blocks will print every time if the blocks are not positively latched by the timing mechanism, ready to be released the next time the solenoid power is taken off from the latch, permitting it to fall to open position.

In printing a rug with blocks which are say three feet wide, by twelve feet long to print a nine by twelve foot rug, using end blocks which contain eighteen inch ends for two adjoining rug designs, there will be one impression of an end block for every three impressions of body blocks, and thus with the body to be printed fed step by step, each body block for the several colors will be lowered to print three successive times, and then held up one time, and the end blocks for each color will be held up three times, and printed once, so as to make impressions where the body blocks were not impressed upon the piece.

I attain my objects by that certain construction and arrangement of parts of which a specific example will be described, and the novelty inherent therein, or in equivalents thereof, will be stated in the appended claims.

In the drawings:—

Figure 1 is a side elevation of one of the print block operating mechanisms, used for the "body" printing.

Figure 2 is a like view of one of the block operating means for end border printing.

Figure 3 is a plan view of a rug design, marked into zones to indicate body and end printing.

Figure 4 is a side elevation without detail, illustrating one type of flat block printing machine.

Figure 5 is a detail of the switch mecha-

nisms for timing the operation, and a diagrammatic view of the solenoid devices.

Figure 6 is a diagram showing two arrangements of contacts.

Figure 7 is a side elevation of one of the contact disks.

Figure 8 is a front elevation of a contact disk for an "end" block control.

Figure 9 is a perspective of a contact piece.

Figure 10 is a front elevation of a contact disk for a "body" block control.

Referring first to the showing of a typical machine to which my invention may be attached. In Figure 4 I show a bed 1, over which a sheet of material to be printed is moved in a step by step manner. The printing blocks 2 are carried in frames 3, and are lifted and brought down against the work by means of cams 4, having shoes 5, extending therefrom, which serve to pull the blocks down against the work.

As shown in Figures 1 and 2, the blocks are provided with depending arms 6, having notched shoulders 7, into which the latches engage, and anti-friction rollers 8 at the ends of the arms, whereby engagement is made with the cams.

The arrangement is such that at the high point of the cams 4, the rollers are lifted high enough to permit the latches to disengage, and at the low points of the shoes, the blocks are pressed against the work to accomplish a printing.

The usual latch in machines of the type noted, consists of a hooked arm 9, mounted on a shaft or rod 10, to which is attached a weight arm, whereby the latch is swung automatically in or out of an engagement which will hold up the block against downward movement, and high enough for its roller to be out of engagement with the projecting shoe on the cam.

As shown for illustration in Figures 1 and 2, the latch weight arm tends to pull into engagement, the latch for the end block, and to hold out of engagement the latch for the body block. If, however, the latch which swings out of the way, is held in latching position past the high point of the cam for the block being latched, then until the next operation of the press, the block will stay out of operation, even if the latch be released, because the weight of the block will hold the latch in place. Where the latch swings into place by gravity or a spring, some means is required to release it, in order for the block to follow the cam downwardly in any instance.

In Figure 5 are shown two latches 9, held on shafts 10. The shafts have brackets 12 thereon, in which are held the weight arms 11. The weight arms are provided with weights 13, and are connected each by means of a link 14, pivotally connected to the arms, and also pivotally connected to the cores 15 of the operating solenoids 16.

The timing switch device controls the passage of electric current to the solenoids, resulting in swinging the latch to the left of Figure 5, out of meshing position, as urged by its weight arm, and swinging the latch to the right in said figure to meshing position, from which its weight arm urges it away. From what has been stated, it will be evident that the latch to the left is for use with the least operated blocks or in this case end blocks, and the latch to the right is for the most operated or body block.

As shown in Figure 3, the end blocks may be made to print the zones A of a design for a rug, for example, serving in this instance for two rugs, and body blocks will print the zones B of the rug design. The instance noted of a nine by twelve rug can be applied directly to this outlined print design.

The timing devices are mounted in a frame composed of standards 20, which journal a shaft 21, on which the contact disks are mounted. Segmental mounting plates 22 are arranged on the standards at the two ends of the shaft, to mount the contact brushes. In the upper corners of the segmental mounting plates are arranged two rods 23, and 24, and the brushes are set over these rods. The brushes have bodies 25, arranged to slide over the rods, and to be clamped in set position with set screws, and on the bodies are conductive fingers 26, say of copper strip, which engage the peripheries of the contact disks. The contacts on one rod form the terminals for one side of separate circuits to the several solenoids, and the contacts on the other rod serve as the other terminals. Thus, when the brushes are bridged by conductive strips on the peripheries of the contact disks, circuits are closed to the solenoids of the pairs of brushes bridged. As in any such arrangement, one side of each circuit may be to a ground connection.

The disks are formed of fibre bodies 27, held between metal or fibre plates 28, which plates are apertured to be arranged over the shaft 21. The contacts proper are in the form of plates 29 on the peripheries of the disks, the plates being longer for the body block controls than for the end block controls in machines of the type illustrated, as suitable for use with my invention. This feature is arranged for use with the particular machine, and is not necessary in other types of machines to provide this particular arrangement.

On each disk, as the plate 29 terminates, there is a step 30 in the periphery of the disk, so that a quick break is provided for the operation of the rotary switch, composed of each disk, and its two wiping or contact fingers.

The drive for the timing switch element comes in the illustration from the shaft 31, which is driven with the feed for the ma-

terial, and the block lowering and raising cams. This shaft has a gear 32, meshing with a gear 33, on shaft 34. On the shaft 34 is a gear 35. The gear 35 engages the gear 36 on the shaft of the timing switch.

The gear can also drive a companion set of switches as indicated in Figure 6, which may be set for a different speed of operation and a different timing. In this instance the gear 35^a is mounted on an arm 35^b and is planetary of the gear 35.

In the printing of shorter units, it is necessary to drive the timing switches more rapidly with relation to the feed of the material than with longer units, since the units to be printed are shorter, and a single complete revolution of the switch must cover a control for each printing cycle, and the switch must be back to starting position in less time than when longer units and more impressions are to be made. Thus, when using one split end block, and one body block, the timing switch disk for the end block will have to revolve one full revolution for each two steps of movement, whereas with three body blocks, and one end block, it will have to revolve once in every four printing periods.

This change is readily accomplished by means of gears to be changed on the time shaft, since the planetary gear can be swung into mesh with any sized gear on the said time shaft.

Having thus described a typical instance of use of my invention, what I claim as novel in the invention, and desire to secure by Letters Patent is:—

1. In a block printing machine having means for raising and lowering a series of printing blocks, latches to hold said print blocks out of operation, electrical devices to control the movement of said latches, and a master switch driven with the said printing machine, and connected to control the flow of current to said electrical devices, said master switch comprising a series of rotary contacts, said contacts constructed as disks on a shaft having in their peripheries conductive plates of less length than said peripheries, and conductive fingers arranged to engage said disks, and arranged in pairs for each disk, whereby the conductive plates on the disks close a circuit between said fingers.

2. In a flat block printing machine, the combination of a series of print blocks, means for raising and lowering said blocks, latches for the blocks to hold them out of operation, means urging the latches of blocks which are to be printed infrequently to latching position, and means urging the latches of the blocks which are to be printed frequently to unlatching position, and a master control element driven with the drive for the blocks, and connected to periodically unlatch the one set of latches, and periodically hold the other set in latching position, said master control element being constructed as a master electrical switch and electrical devices for acting upon the latches.

3. In a flat block printing machine, the combination of a series of print blocks, means for raising and lowering said blocks, latches for the blocks to hold them out of operation, means urging the latches of blocks which are to be printed infrequently to latching position, and means urging the latches of the blocks which are to be printed frequently to unlatching position, and a master control element driven with the drive for the blocks, and connected to periodically unlatch the one set of latches, and periodically hold the other set in latching position, said master control element being formed as a rotary switch, comprising a series of rotary contact members, and contact fingers engaging the same, one disk and contact finger assembly serving to control the latching of each block.

4. In a flat block printing machine, the combination of a series of print blocks, means for raising and lowering said blocks, latches for the blocks to hold them out of operation, means urging the latches of blocks which are to be printed infrequently to latching position, and means urging the latches of the blocks which are to be printed frequently to unlatching position, and a master control element driven with the drive for the blocks, and connected to periodically unlatch the one set of latches, and periodically hold the other set in latching position, said master control element being formed as a rotary switch, comprising a series of rotary contact members, and contact fingers engaging the same, one disk and contact finger assembly serving to control the latching of each block, and means for rotating said contact members as a unit, once for each complete cycle of printing successive closed end patterns, in which the infrequently moved blocks form the ends.

5. In a flat block printing machine, the combination of a series of print blocks, means for raising and lowering said blocks, latches for the blocks to hold them out of operation, means urging the latches of blocks which are to be printed infrequently to latching position, and means urging the latches of the blocks which are to be printed frequently to unlatching position, and a master control element driven with the drive for the blocks, and connected to periodically unlatch the one set of latches, and periodically hold the other set in latching position, said raising and lowering means being so arranged that during the preliminary downward movement of the blocks, they are released to move by gravity, whereby a holding of an automatically opening latch in latching position, as stated above, will result in the latch holding the block out of operation, and the raising of the block back from said gravity engagement with the latch will release the latch to move to its automatic

open position, said master control element being formed as a rotary switch comprising a series of rotary contact members, and contact fingers engaging the same, one disk and contact finger assembly serving to control the latching of each block, and means for rotating said contact members as a unit, once for each complete cycle of printing successive closed end patterns, in which the infrequently moved blocks form the ends.

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