Oct. 12, 1937. W. S. WARNOCK 2,095,724

PRINTING PLATE REGISTERING DEVICE

Filed June 3, 1935

Fig. 1.

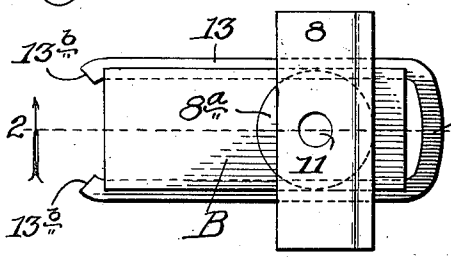


Fig. 5.

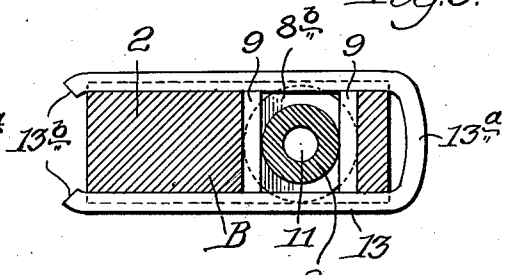


Fig. 2.

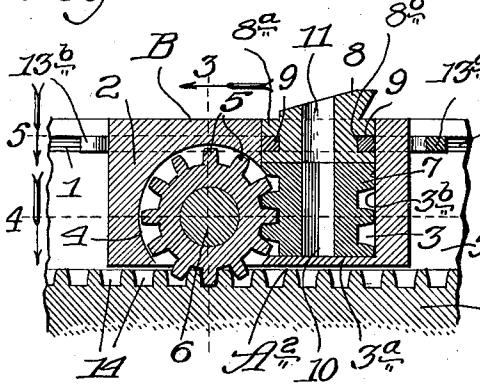


Fig. 3.

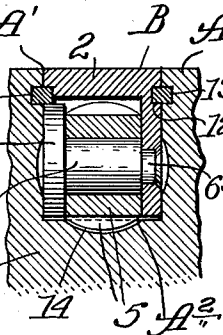


Fig. 6.

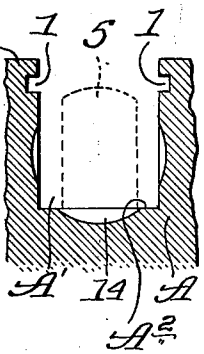


Fig. 4.

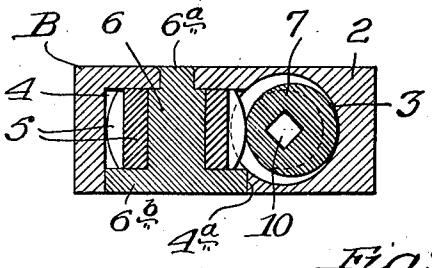


Fig. 7.

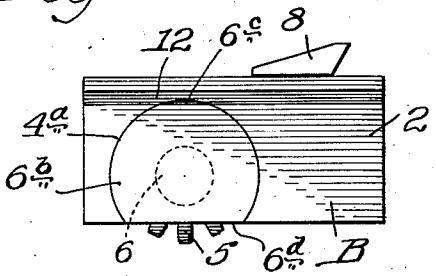


Fig. 9.

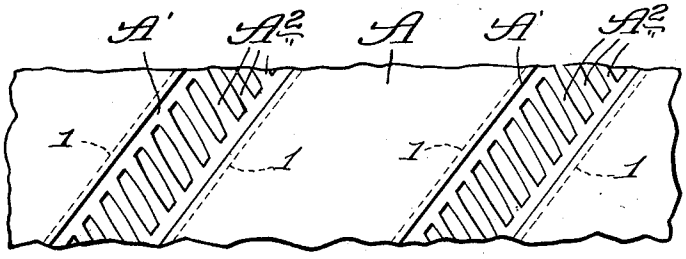
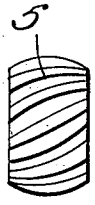


Fig. 8.



Inventor:
Wallace S. Warnock,
By Dyrenforth, Lee, Chritton & Wiles,
Attys.

Patented Oct. 12, 1937

2,095,724

UNITED STATES PATENT OFFICE

2,095,724

PRINTING PLATE REGISTERING DEVICE

Wallace S. Warnock, Chicago, Ill.

Application June 3, 1935, Serial No. 24,732

2 Claims. (Cl. 101—388)

This invention relates particularly to printing-plate registering devices which are adapted to travel in slots in foundation-plates to which printing plates, or forms, are to be secured in properly registered position.

The primary object of the invention is to provide a simplified, reliable, and durable device for the purpose indicated.

The invention is illustrated in a preferred embodiment in the accompanying drawing, in which—

Fig. 1 is a plan view of an improved traveling-register-block, forming part of my invention; Fig. 2, a broken vertical section taken as indicated at line 2 of Fig. 1, the section showing also a portion of the track formed in the bottom of a groove of the foundation-plate, or bed; Fig. 3, a broken transverse vertical section taken as indicated at line 3 in Fig. 2; Fig. 4, a horizontal sectional view of the traveling block taken as indicated at line 4 of Fig. 2; Fig. 5, a plan sectional view of the block, taken as indicated at line 5 of Fig. 2; Fig. 6, a broken sectional view showing one of the grooves of the bed-plate; Fig. 7, a side elevational view of the traveling block; Fig. 8, an elevational view of a worm-wheel employed, this worm-wheel meshing directly with the actuating worm and also with segmental worm-wheel teeth which are formed in the bottom of the slot in the bed-plate; and Fig. 9, a fragmentary plan view of a bed-plate to which the traveling blocks are adapted.

In the illustration given, A designates a foundation-plate, or bed-plate, which is provided with a series of parallel slots A′, the metal of the bottom walls of which has formed therein segmental spiral teeth A^2 of suitable form to work in proper relation with a worm-wheel; and B, a block slidably mounted in a slot A′, said block being equipped with a plate-clamp and with means for propelling the block in the slot.

It is customary for printers to employ, either upon a flat bed, or upon a cylindrical bed, as many foundation-plates of suitable size as may be required; and it is customary to provide such foundation-plates with a series of diagonal slots which are parallel with each other. As many register-blocks as may be desired are employed in slots in the foundation-plate as a means of registering and anchoring the printing-plate, or printing-form, in proper position.

The lateral walls of the slots A′ preferably are provided at their upper portions with guide-grooves 1.

The device B is shown as comprising a block 2 which may be cast from suitable metal, said block being provided with a worm chamber 3 which opens through the upper surface of the block, and with a worm-wheel chamber 4 which opens through one lateral wall of the block; a worm-wheel 5 in the chamber 4, supported on a horizontal journal 6 which has a reduced end 6^a extending through and riveted in a perforation in one lateral wall of the chamber 4 and which has an enlarged head, or flange, 6^b which conforms to the orifice 4^a which constitutes the open end of the horizontally disposed chamber 4; a worm 7 journaled in the chamber 3 and capable of being inserted and removed through the open upper end of said chamber; and a swiveled plate-clamp 8 having a journaled portion 8^a which is provided with a peripheral groove 8^b which is engaged by pins 9 which extend through transverse slots or openings with which the block 2 is provided.

Preferably, the worm 7 is journaled in the walls of the chamber 3. That is, the member 7 is dropped into position and rests on the bottom wall 3^a of the chamber, while the circumferential portion of the worm bears within the circumferential wall 3^b of the chamber. The worm is provided with an angular socket 10 adapted to receive a key by means of which the worm may be turned to actuate the worm-wheel 5; and the clamp 8 is provided with a registering central perforation 11 through which the key may be inserted.

As thus described, the lower surface of the journal-portion 8^a of the plate-clamp forms a bearing for the upper end of the worm 7.

The outer surfaces of the lateral walls of the block are shown provided with longitudinal grooves 12 which are adapted to receive the longitudinal members 13 of a U-shaped bar which has a web 13^a connecting the arms at one end. The arms are provided at their free ends with beveled shoulders 13^b. The U-shaped member is adapted to be forced onto the block with the arms or members 13 engaging the grooves 12 thereof. The block, thus equipped, may be entered in a slot of the foundation-plate with the members 13 engaging the guide-grooves 1 in the manner shown in Fig. 3. Thus, the block is constrained to move horizontally in the slot and is prevented from being lifted from the slot when clamping action is applied to the printing-plate, or when the block is caused to travel by operation of the worm-wheel 5 in the toothed track A^2.

The outer surfaces of the lateral walls of the

block 2 engage the inner surfaces of the lateral walls of the slot A', as shown in Fig. 3.

Preferably, the segmental spiral teeth A^2 are formed by a suitable hobbing, or tapping, operation, which forms grooves 14 between the teeth. That is, the implement which forms the teeth is forced into or caused to cut the metal and form the spaces 14 and at the same time form the teeth A^2. Preferably, the teeth A^2 extend substantially across the bottom of the slot, as appears from Fig. 3. On the other hand, the worm-pinion 5 preferably is considerably narrower than the slot A', and has the transversely rounded external form shown in Fig. 8, and shown also in dotted lines in Fig. 6. Moreover, the depth of the teeth in the worm-pinion 5 is less than the depth of the teeth in the rack A^2. Accordingly, any dirt, dried ink, or the like, which may drop into the slot A' will be forced out of the way of the traveling pinion 5 and will tend to work towards the lateral portions of the spaces 14 between the rack-teeth. Of course, the slots of the foundation-plate may be cleansed at intervals, as is customary with printers.

Experience has shown that it is possible to satisfactorily operate the register-block by means of a worm which meshes with the teeth of a worm-wheel, the teeth of said worm-wheel meshing directly with spiral segmental teeth with which the bottom of the slot of the foundation-plate is provided. By this means, the construction of the register-block is simplified, and durability and reliability are insured. By having the worm-wheel 7 of uniform diameter (disregarding the spiral grooves between the teeth), a good bearing between the worm-wheel and the walls of the chamber 3 is assured.

It is understood, of course, that any suitable guide-connections between the register-block and the lateral walls of the slot in the foundation-plate may be employed.

The journal-head 6^b has segments cut away at its upper and lower portions, as indicated at 6^c and 6^d in Fig. 7. The outer face of said journal-head forms a continuation of the lateral face of the block.

The foregoing detailed description has been given for clearness of understanding, and no unnecessary limitations should be understood therefrom.

What I regard as new and desire to secure by Letters Patent is:

1. A printer's register-block device comprising: a block adapted to travel in a slot in a foundation-plate, said block having a vertical worm-chamber which opens through the top of the block and a horizontal pinion-chamber which opens through one lateral side of the block and also through the bottom of said block; a worm-pinion in said pinion-chamber projecting through the bottom opening thereof and having spiral teeth adapted to engage segmental spiral teeth in the bottom of a slot in the foundation-plate; a horizontal journal for said worm-pinion having a reduced end riveted in a lateral wall of the pinion-chamber and having an enlarged head serving as a closure at the opposite end of the pinion-chamber, said head having two cut-away portions forming flats, one of said flats being in the plane of the bottom of said block, and the other being engaged by a U-shaped guide-key to prevent rotation of the journal; a worm in said worm-chamber and confined by the bore thereof, said worm meshing directly with said worm-pinion and having a key-socket in its upper end; and a plate-clamp having a journal-portion rotatably confined in the upper end of said worm-chamber and serving to confine said worm in said bore, said plate-clamp having therethrough a key-opening registering with said key-socket.

2. In combination: a foundation-plate provided with slots having spiral worm-pinion-engaging teeth formed in the metal of said plate in the base-walls of said slots so that the tops of said teeth are in the plane of the face of said base-walls; and a printing-plate registering device adapted to travel in a slot, comprising a block having sliding connections with the slot confining the block to travel in close relation over said teeth, said block having therein a worm-pinion-chamber and a worm-chamber; a worm-pinion in said first-mentioned chamber supported on a transverse journal having spiral teeth directly engaging said first-mentioned teeth, said journal having at one end an enlarged head which closes one side of the worm-pinion-chamber and at the other end a reduced extremity riveted in a perforation in a lateral wall which is an integral portion of said block, said enlarged head having a segment cut away at one side to form a flat adapted to lock the journal against rotation by engagement with a U-shaped key, said key serving also to hold the block in slidable engagement with the slot; a vertical worm in said second-mentioned chamber engaging the teeth of said worm-pinion; and a printing-plate clamp swivelled on said block above said worm and having an axial perforation therethrough registering with a key-socket with which said worm is provided.

WALLACE S. WARNOCK.