

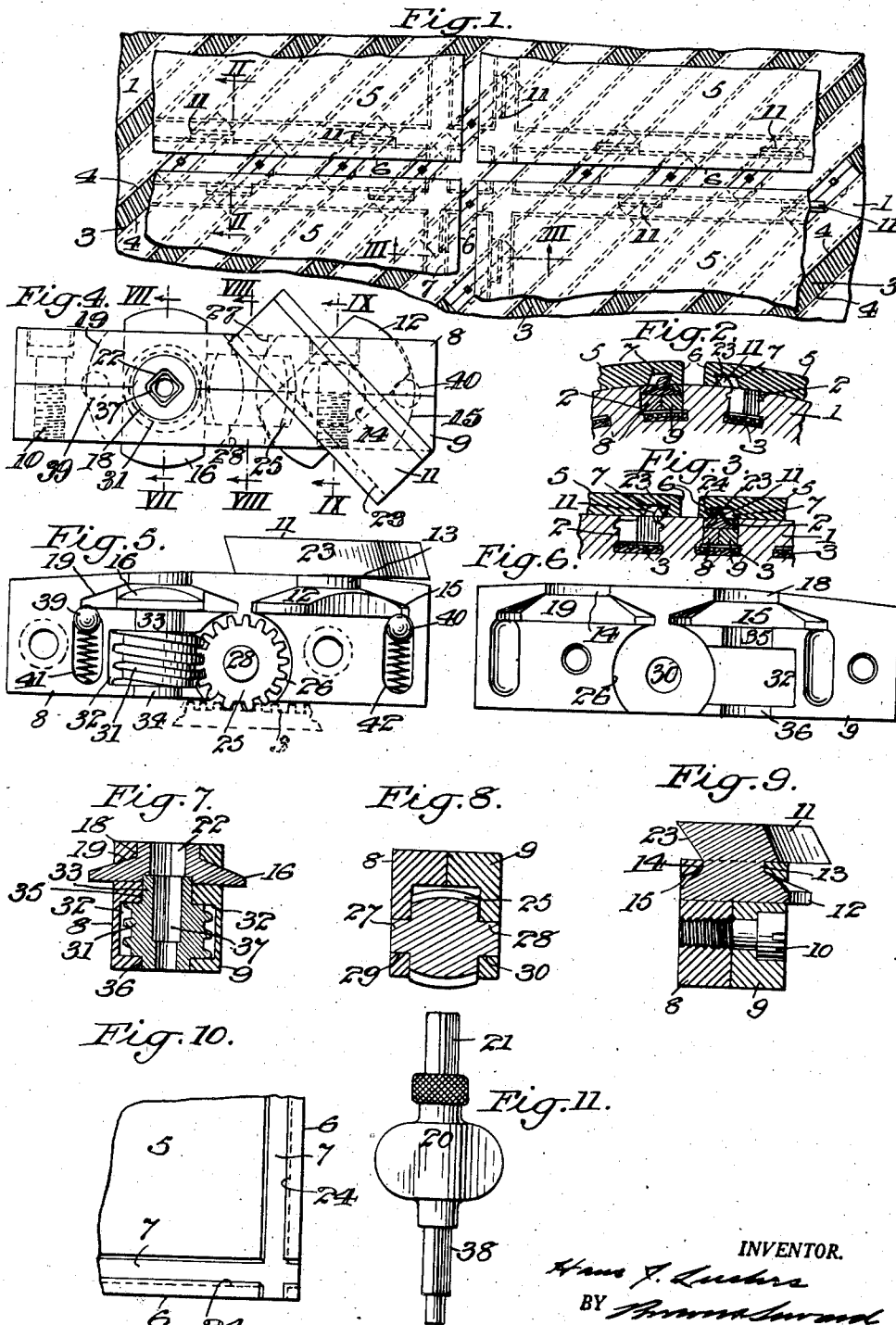
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H. J. LUEHRS

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MEANS FOR SECURING PRINTING PLATES TO THEIR BASES

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INVENTOR.
Hans J. Luehrs
BY *Thomson*
ATTORNEYS

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MEANS FOR SECURING PRINTING PLATES
TO THEIR BASESHans J. Luehrs, Westerly, R. I., assignor to C. B.
Cottrell & Sons Company, Westerly, R. I., a
corporation of Delaware

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1

In the usual means for and method of securing printing plates to their bases, such, for instance, as plate cylinders, it has been customary to secure the plates to their bases under compression by the use of plate clamps which overlapped, in the past, beveled marginal edges of the plates. These clamps served to force the plates inwardly at their marginal edges and thus prevented their firm and close contact with their bases throughout the entire back surfaces of the plates.

Furthermore, the interposition of the usual plate clamps between the beveled edges of adjacent plates also prevented their close positioning on their bases, thereby resulting in a considerable loss of paper as well as average production.

Furthermore, the plates, because of this compression, were liable to become loosened and displaced and thus caused much damage, especially when the plates were secured to plate cylinders designed to rotate at the high speeds now required for increased production; the centrifugal action causing undue stresses on the plates.

The object of my invention is to firmly and snugly secure the plates to their bases by causing the jaws of the adjustable plate register hooks to engage the backs of the plates adjacent their marginal edges and exert a pull on the plates at their margins in securing the plates under lengthwise and crosswise tension to their bases.

This arrangement also permitted the plates to be positioned on their base much closer together, both by the elimination of their beveled edges and by the removal of the hook jaws from between the plates to positions underneath the plates.

A further object is to secure the plates to their grooved bases by providing grooves along the backs of the plates adjacent their marginal edges and providing register hooks which are adjustable along their base grooves, with their plate engaging jaws arranged to enter the said plate grooves; the coacting sides of the grooves and jaws being shaped to cause the hooks to exert tension on the plates, toward the base, both lengthwise and crosswise of the plates, when securing them to their bases.

A further object is to provide a novel arrangement of the several elements of the plate register hooks whereby the instrument for manually adjusting the plates along the base grooves may be applied to the hook propelling gears between the squared edges of the plates instead of applying the said instrument to the hook propelling gears through the plate engaging jaws of the hook.

2

A practical and novel means for carrying out my invention is represented in the accompanying drawing in which

Fig. 1 represents a detail plan view showing the adjacent corners of four printing plates secured to their plate cylinder;

Fig. 2 represents a detail section taken in the plane of the line II—II of Fig. 1;

Fig. 3 represents a detail section taken in the plane of the line III—III of Fig. 1;

Fig. 4 represents a top plan view of the plate register hook, on an enlarged scale, the plate engaging jaw and double winged locks being shown in their plate securing positions;

Fig. 5 represents an inside view of the plate register hook with one of its complementary body members removed;

Fig. 6 represents an inside view of the removed complementary body member of the hook;

Fig. 7 represents a transverse section through the register hook, taken in the plane of the line VII—VII of Fig. 4;

Fig. 8 represents a transverse section, taken in the plane of the line VIII—VIII of Fig. 4;

Fig. 9 represents a transverse section taken in the plane of the line IX—IX of Fig. 4;

Fig. 10 represents a detail back view of one of the printing plates on the same scale as that shown in Figs. 1, 2 and 3; and

Fig. 11 represents a side view of an instrument which might be used for either propelling the plate register hook or for operating the second double winged lock.

The base to which the printing plates are to be secured is herein shown as a plate cylinder 1 having spaced helical grooves 2 provided with racks 3 along their bottom walls and with overhanging ledges 4, 4 along their side walls, as is usual. The curved printing plates 5 are each shown as having four squared marginal edges 6 instead of the usual beveled edges, thus permitting the plates to be positioned in close proximity to one another on their cylinder. These plates 5 also have grooves 7 extending along their backs adjacent their squared edges 6, which grooves are arranged to receive the jaws of the plate register hooks to be immediately described.

The elongated body of the register hook is shown as divided longitudinally and vertically into two complementary members 8, 9 removably fastened together by cross screws 10. This divided body is shaped to permit its ready insertion into and removal from its cylinder groove 5 2 at any desired point along the same, when the

two locks carried by the hook are housed within the body in their retracted positions.

The plate engaging jaw 11, the double winged lock 12 and their connecting neck 13 are formed integral, to cause the jaw 11, as it is turned, to swing the double winged lock 12 to its extended and retracted positions. The neck 13 of the combined jaw and lock is journaled in a divided opening 14 which extends upwardly through the top of the hook body and also downwardly into a divided recess 15 opening through the sides of the body and shaped to fit the double winged lock 12.

A second double winged lock 16 has a hollow central bore which is journaled in a divided opening 18 extending upwardly through the top of the body and also downwardly into a divided recess 19 opening through the sides of the body, and shaped to fit said second double winged lock 16. This lock 16 may be turned into its extended and retracted positions by the application of a suitable instrument, such as a key 20 having a shank 21 of non-circular cross section, to fit the non-circular bore 22 through said lock 16.

The means for propelling each of the plate register hooks along its cylinder groove 2 to cause the undercut inclined side 23 of the jaw 11 to engage the undercut inclined wall 24 of the selected plate groove 7, is shown as comprising the following elements: a horizontally disposed rack engaging gear 25 is located in a suitably shaped divided recess 26 which opens through the bottom of the body to permit the gear to engage the cylinder rack 3. The shaft extensions 27, 28 of the gear 25 are journaled in openings 29, 30 in the body members 8, 9. The hollow vertically disposed worm 31 which meshes with the rack engaging gear 25 is located in a suitably shaped divided recess 32 in the body and its upper and lower shaft extensions 33, 34 are journaled in divided openings 35, 36 in the body.

This hollow worm 31 is located in axial alignment with the hollow second lock 16 and the non-circular bore 37 of the worm is smaller in diameter than the non-circular bore 22 of the second lock 16 for the fitted reception of the second non-circular shank 38 of the key 20, which shank may be inserted freely through said second lock bore 22.

Means such as spring pressed balls 39, 40 located in recesses 41, 42 in one of the members of the body, may be employed for yieldingly holding the first and second locks 12 and 16 in their extended and retracted positions.

In operation: the plate register hooks are positioned along the cylinder grooves 2 in proper positions to cause their plate engaging jaws 11 to enter their selected plate grooves 7. The second double winged lock 16 may then be brought into its extended position in engagement with the undersides of the ledges 4, 4 by the insertion and operation of the shank 21 of the key 20. The shank 38 of the hook propelling key 20 may then be inserted between the adjacent squared edges 6 of the plates 5 and freely through the bore 22 of the second lock 16 of each of the plate register hooks, into the bore 37 of the worm 31. By turning this key the hook will be propelled a short distance along the cylinder groove 2 to bring the undercut inclined wall 23 of the jaw 11 into contact with its coacting undercut inclined outer wall 24 of the plate groove 7 in which the hook is located. The further turning of the key will cause the jaw to pull the plate under tension, both lengthwise and crosswise, snugly and firm-

ly onto its cylinder 1 and also cause the first double winged lock 12 to snugly engage the undersides of the cylinder groove ledges 4, 4.

It will be noted that by making the combined jaw and lock imperforate, the elements will be much stronger and consequently more efficient, especially where the hooks are subjected to the great strain due to the pull on the plates to tension them and to the stresses caused by the centrifugal action of the cylinder under the high speeds now required for increased production.

It will also be seen that the propelling gears 25 and 31 cannot be manipulated by an instrument inserted through the combined jaw and lock as the same will be located underneath the plate when the plate register hook is positioned to secure the plate to its cylinder.

It will also be observed that the hook propelling means is operated by an instrument inserted through the second lock at a point spaced along the hook body from the combined jaw and lock.

It will also be seen that by providing larger and smaller bores respectively for the second lock and the worm, the second lock may be operated independently of the propelling means after the hook has been brought into its position to snugly draw the plate under tension to its cylinder.

It will be understood that by the term "base" as used in the claims herein I wish to include a base having either a flat surface for use with flat printing plates; or a base having a curved surface, as a plate cylinder for use with curved printing plates; the plate register hooks being essentially the same in their construction and operation in each instance.

The elements shown and described but not claimed herein form the subject matter of my copending application filed of even date herewith, its serial number being 476,199.

What I claim is:

1. A base having spaced grooves along its surface, a printing plate having intersecting grooves along its back adjacent all of its marginal edges, plate register hooks engaging said base and plate grooves, and means for propelling the hooks along the base groove in directions to secure the plate to the base under tension comprising propelling gears within said hooks and a suitable removable instrument insertable into the hooks for operative engagement with said propelling gears.

2. A cylinder having spaced spiral grooves along its surface, a curved printing plate having intersecting grooves along its back adjacent its straight and curved marginal edges, plate register hooks engaging said cylinder and plate grooves, and means for propelling the hooks along the cylinder grooves in directions to secure the plate to the cylinder under tension comprising propelling gears within said hooks and a suitable removable instrument insertable into the hooks for operative engagement with said propelling gears.

3. A base having spaced grooves along its surface, a printing plate having intersecting grooves along its back adjacent all of its marginal edges, and plate register hooks engaging said base and plate grooves for securing the plate to the base under tension, each hook comprising a body having journaled therein an axially imperforate combined jaw and lock and hook propelling gears, said body and one of said gears having

5

axially alined holes spaced from the said combined jaw and lock for the insertion of a suitable instrument into operative engagement with said gears.

4. A cylinder having spaced spiral grooves along its surface, a curved printing plate having intersecting grooves along its back adjacent its straight and curved marginal edges, and plate register hooks engaging said cylinder and plate grooves for securing the plate to the cylinder under tension, each hook comprising a body having journaled therein an axially imperforate combined jaw and lock and hook propelling gears, said body and one of said gears having axially alined holes spaced from the said combined jaw and lock for the insertion of a suitable instrument into operative engagement with said gears.

5. A base having spaced grooves along its surface, a printing plate having intersecting grooves along its back adjacent all of its marginal edges, and plate register hooks engaging said base and plate grooves for securing the plate to the base under tension, each hook comprising a body hav-

6

ing journaled therein an axially imperforate combined jaw and lock, a second lock and hook propelling gears, said body, second lock and one of said gears having axially alined holes spaced from the said combined jaw and lock for the insertion of a suitable instrument into independent operative engagement with said second lock and gears.

6. A cylinder having spaced spiral grooves along its surface, a curved printing plate having intersecting grooves along its back adjacent its straight curved marginal edges, and plate register hooks engaging said cylinder and plate grooves for securing the plate to the cylinder under tension, each hook comprising a body having journaled therein an axially imperforate combined jaw and lock, a second lock and hook propelling gears, said body, second lock and one of said gears having axially alined holes spaced from the said combined jaw and lock for the insertion of a suitable instrument into independent operative engagement with said second lock and gears.

HANS J. LUEHRS.