Nov. 17, 1953

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2,659,479

TYPOGRAPHICAL MACHINE

Filed Jan. 16, 1951

2 Sheets-Sheet 1

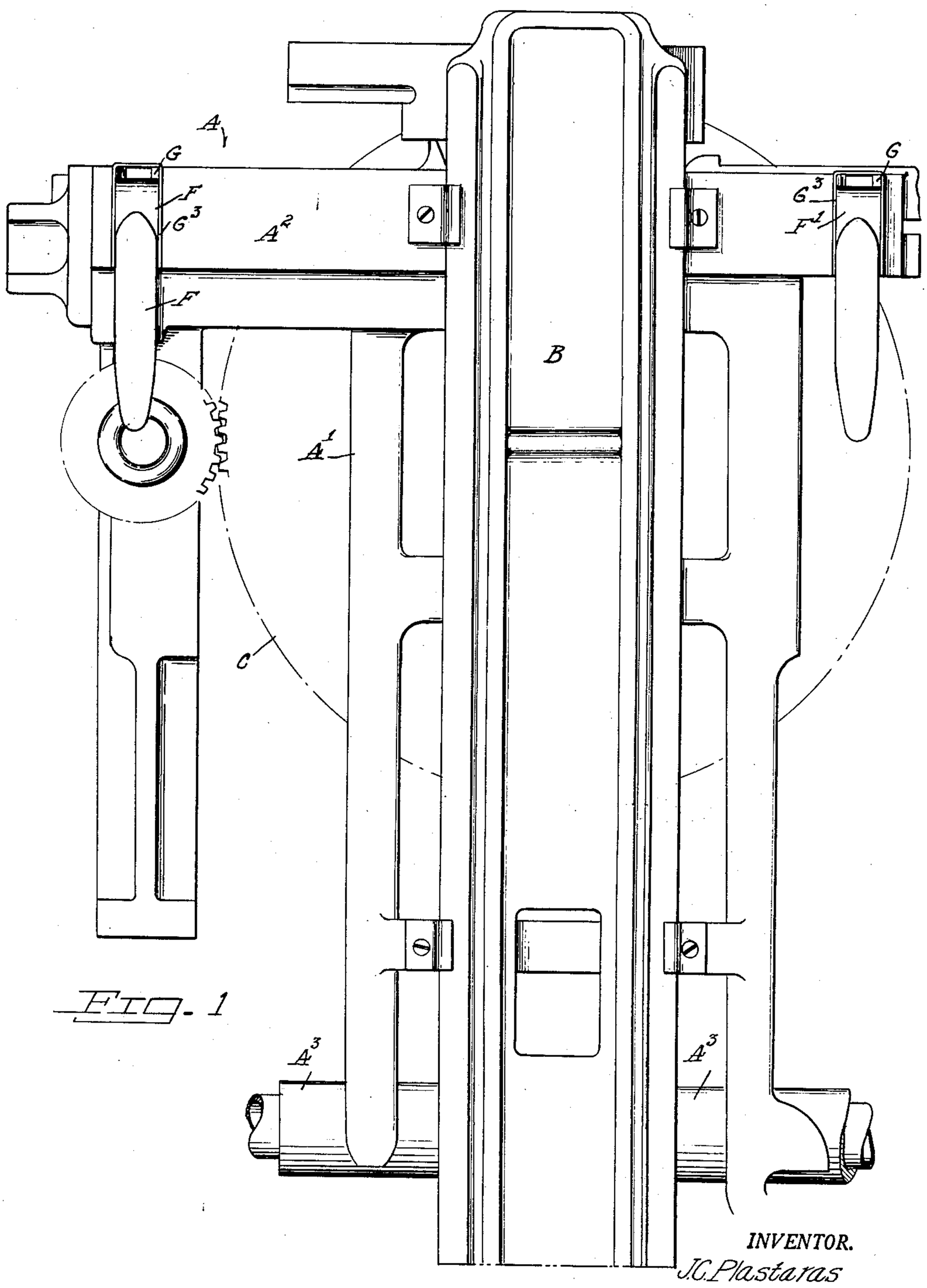

Fig. 1

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2 Sheets-Sheet 2

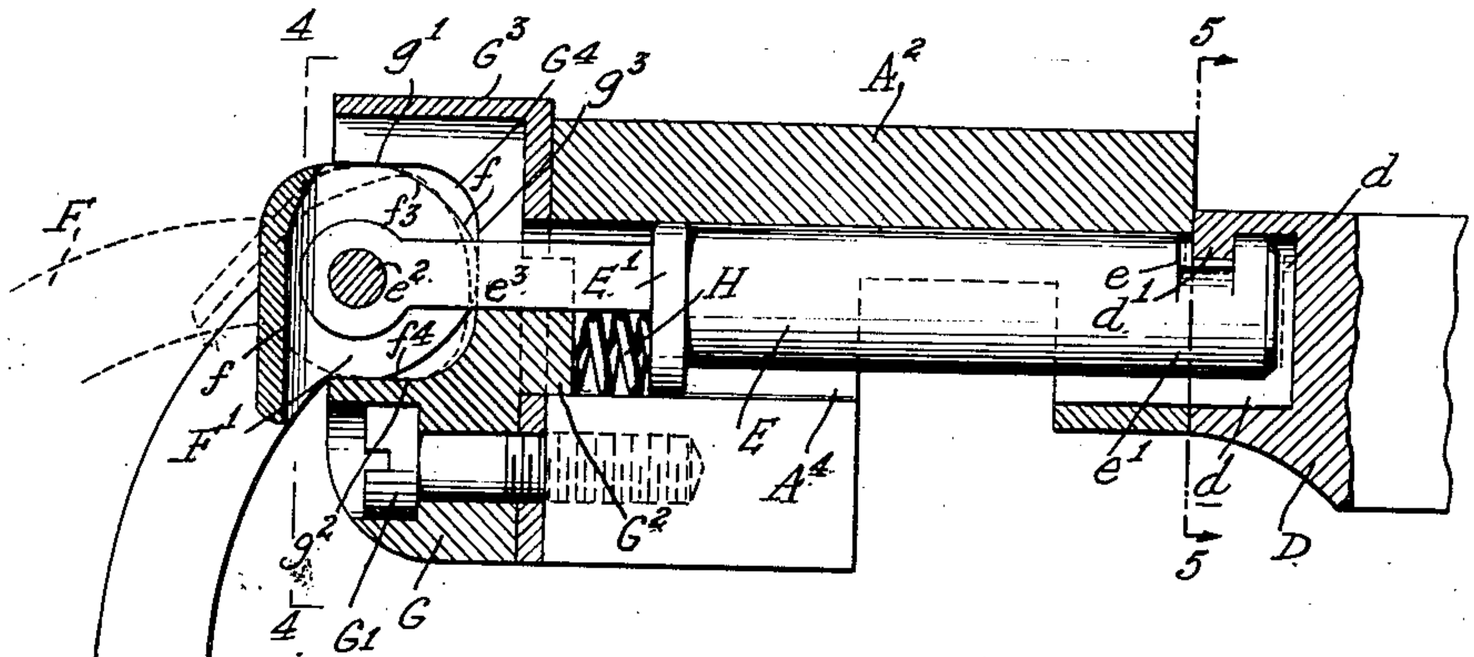
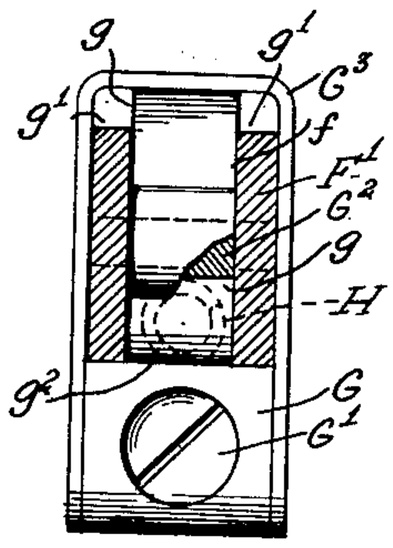


Fig. 2



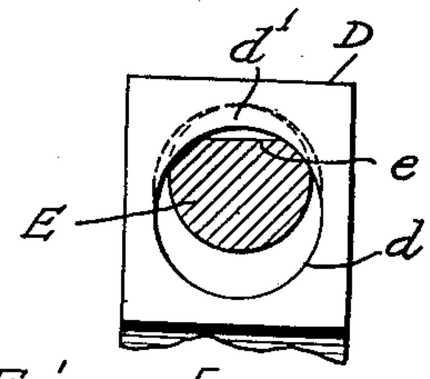


Fig. 5

Fig. 4

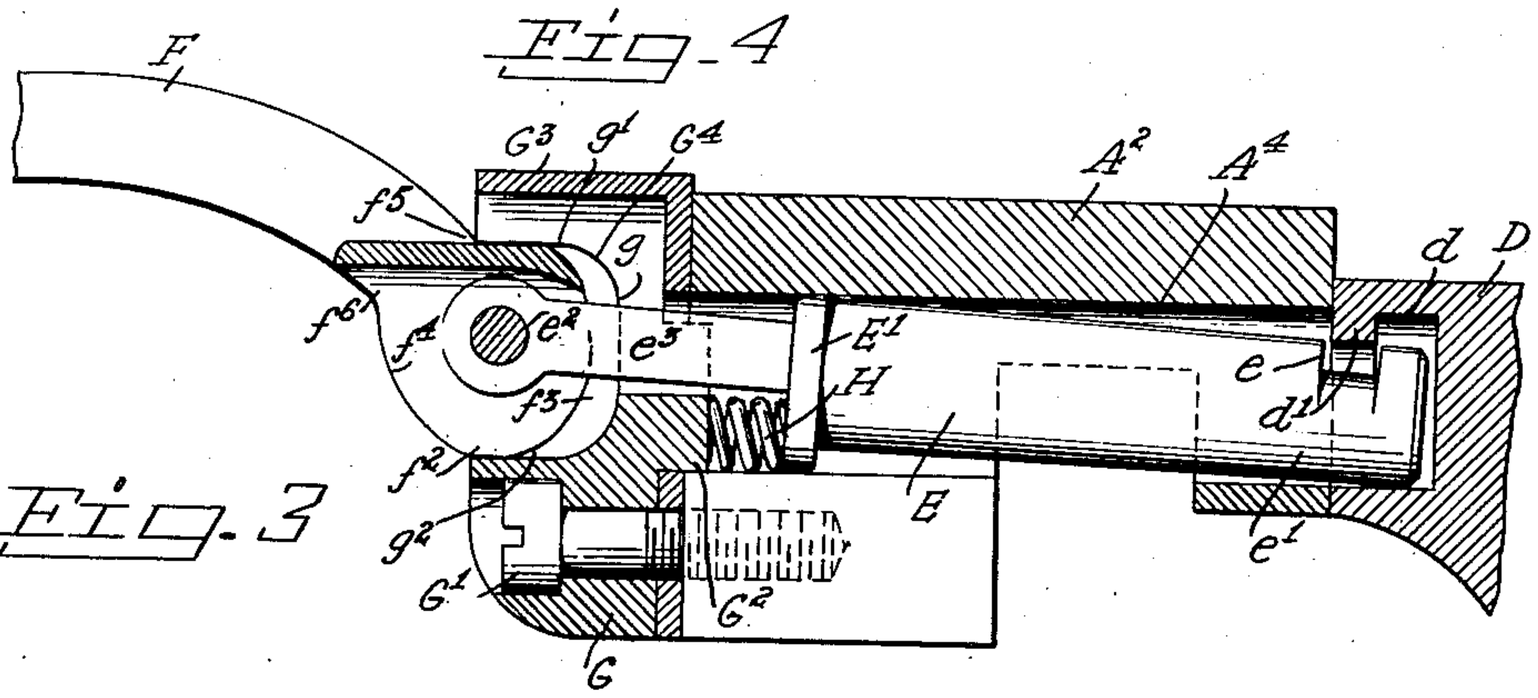


Fig. 3

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TYPOGRAPHICAL MACHINE

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Application January 16, 1951, Serial No. 206,144

9 Claims. (Cl. 199—50)

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This invention relates to typographical machines, such as Linotype machines of the general organization represented in U. S. Letters Patent to O. Mergenthaler, No. 436,532, wherein circulating matrices are released from a magazine in the order in which their characters are to appear in print and then assembled in line, after which the composed line is delivered to a vertically movable transporter or first elevator slidably mounted in a so-called "vise frame" and operable during a machine cycle, first, to carry the matrix line downwardly to the casting position where the line is justified between a pair of clamping jaws and then, after the casting operation, to raise the line to an upper level where it is transferred from the elevator for distribution.

The vise frame is located directly in front of the casting mechanism and includes as usual an upright body portion and horizontally disposed cap portion, the former being equipped with the line justifying mechanism, and the latter being arranged to accommodate the supporting blocks of both clamping jaws as well as certain adjusting devices associated with one of said jaws. At its lower end, the upright portion of the vise frame is hingedly mounted on the machine base so that it may be swung forwardly whenever access to the parts is desired, and a pair of fore-and-aft clamping bolts, located respectively near the opposite ends of the cap portion of said frame, are employed to lock the latter in its normal or closed position.

Heretofore, these clamping bolts have been mounted for a limited rotary movement in screw thread bearings of the vise cap and, at their inner or rear ends, have been formed with laterally offset segmental ribs which are adapted, as the vise frame is closed, to enter correspondingly shaped recesses in fixed banking studs projecting forwardly from the machine frame. In such position of the parts, the offset ribs of the locking bolts are located in engaging relation to internal shoulders of the banking studs and, by turning the bolts counterclockwise in their threaded bearings, the ribs will be carried first behind and then into engagement with the rear face of said shoulders to lock or clamp the vise frame securely in place. At the front, the locking bolts terminate in spaced relation to the vise frame and, to facilitate their rotary movements to locking and releasing position, each is provided with the customary loose lever pin or rod mounted transversely therein and held against escape by collars at either end.

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While such devices have been standard equipment of the commercial Linotype machines for many years, they are outmoded, obtrusive and otherwise objectionable, particularly the one located at the left of the vise frame, which is quite conspicuous and has to be deliberately avoided by persons passing from the front to the rear of the machine.

The present invention is intended to overcome these and other objections and contemplates a pair of improved locking devices including bolts especially adapted for control by separate handles that normally will occupy a position out of the way and will also serve adequately and conveniently in opening and closing the relatively heavy vise frame. To this end, the improved locking bolts are fulcrumed at corresponding points between their ends so that they may be rocked to and from their locking position, and the handles which depend from the front ends of the bolts are operatively connected thereto by means of integral cam-shaped elements housed in appropriate bearing blocks secured to the vise cap. The arrangement is such that when the handles are pulled forwardly and upwardly, the cam elements thereof will be turned in one direction to rock the bolts out of their engagement with the fixed banking studs and, when the handles are pushed downwardly and rearwardly, the cam elements will be turned in the opposite direction to restore the bolts to their locking position. The exact construction of the parts and the manner in which they function will be more clearly understood from the detailed description to follow.

In the accompanying drawings, the invention has been shown merely in preferred form and by way of example and therefore is not limited to any specific form or embodiment except insofar as such limitations are specified in the appended claims.

Referring to the drawings:

Fig. 1 is a front elevation of the vise frame and associated parts, showing the present improvements applied thereto;

Fig. 2 is a vertical section taken transversely through the vise cap, showing one of the improved locking bolts and its control handle in normal position;

Fig. 3 is a section similar to Fig. 2 but showing the parts in their inactive position;

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 2; and

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 2.

The vise frame A (Fig. 1), whereon the first

elevator B is slidably mounted for vertical movement, is disposed directly in front of the rotatable mold disk C (indicated in broken lines) and includes, as usual, the upright body portion A^1 and the horizontal cap portion A^2. At its lower end, the vise frame A is supported by means of suitably spaced apart bearing sleeves A^3 upon a fixed horizontal shaft of the machine base, so that it may be swung forwardly from its normal upright position whenever access to the molds or other parts of the casting and justifying mechanism is demanded. As best shown in Figs. 2 and 3, the vise frame A is located in its normal position by two stationary banking studs D (one only being shown) which project forwardly from separate parts of the main frame and terminate in engaging relation to the rear face of the cap portion A^2 of the vise frame. Near its opposite ends, the cap portion A^2 is provided with a pair of fore-and-aft locking bolts E extending transversely therethrough and slightly beyond the same so that, as the vise frame is swung rearwardly against the banking studs D, the contiguous ends e^1 of the bolts are adapted as usual, and for reasons presently to be pointed out, to enter corresponding recesses *d* formed in the opposing ends of the banking studs. However, and unlike the locking bolts ordinarily employed, the bolts E (Figs. 2, 3 and 4), according to the present invention, are arranged in slightly oversized bores A^4 of the vise cap A^2 and, adjacent their rear ends, they are formed with notches *e* which, in the unlocked position of the bolts shown in Fig. 3, are disposed immediately below and in engaging relation to overlying internal ribs d^1 formed by routing out the upper portions of the side walls of the recesses *d* in the banking studs D. It may be mentioned in this connection that, prior to such routing operation, the recesses *d* are simply drilled to the proper size and depth to accommodate the cylindrical rear end portions e^1 of the locking bolts E. As a result of this construction, it is merely necessary to raise and lower slightly the end portions e^1 of the bolts to carry the rear wall of the notches *e* therein to and from a clamping position directly behind the ribs d^1 of the banking studs D. In providing for such operation of the locking bolts E, they are formed respectively between their ends with predisposed eccentric fulcrum collars E^1 which fit loosely within the bores A^4 in the vise cap A^2 and permit the bolts to be rocked to their different positions for the purpose stated.

For the sake of clearness and since the two locking devices for the vise frame A^2, including the bolts E, are identical in form and arrangement, the remaining parts of but one of said devices and the manner in which they are adapted to function need only be described. Accordingly, and to carry out the invention, the rocking movements of each locking bolt E, is effected by means of a vertically disposed, lever-like handle F formed at its upper end with an integral cam-shaped element or head portion F^1 pivotally connected by a cross pin e^2 to the front end of the bolt E. The cam-shaped element F^1 of the handle F (Figs. 2 and 3), is mounted for a limited rotary movement in opposite directions in a suitable bearing block G, the latter being secured by a clamping screw G^1 to the front face of the vise cap A^2 and formed with a rearwardly offset locating projection G^2 that fits snugly within the contiguous end of the bore A^4 in the vise cap. A housing G^3 for the block G spaces it slightly

from the vise cap and conceals as well as protects the movable parts located therein.

The front end portion e^3 of the locking bolt E, as may be observed (Fig. 2), is centered longitudinally above that of the longer cylindrical portion e^1 thereof so as to be more closely aligned with the notch *e* at the rear end of the bolt E and thus minimize the extent of the rocking movements of the bolt to and from its locking position. It also may be observed (Figs. 2 and 4) that the front end portion e^3 of the bolt E is rectangular in cross section, and that the associated cam element F^1 and the bearing block G therefor are formed with open vertical slots or bifurcations *f* and *g*, respectively, to snugly accommodate this flat-sided portion of the bolt. As a result, the bolt E will be properly guided and sustained against lateral displacement during its rocking movements by the sidewalls of the slot *g* which, as indicated by the dotted lines in Figs. 2 and 3, extends through the projection G^2 of the bearing block G, while the cam element F^1 in turn will be similarly guided and sustained through its direct connection with the front end of the locking bolt E. The cam element F^1 is mounted in a relatively deep recess G^4 formed in the bearing block G, and its rotary movements to different positions therein takes place in opposition to a strong compressible spring H arranged in the bore A^4 between the projection G^2 of said block and the eccentric collar E^1 of the locking bolt.

As best shown in Figs. 2 and 3, the cam element F^1 presents a high portion f^2 and two opposed relatively low portions f^3 and f^4, respectively, the former low portion merging abruptly with the outer surface of the handle F and the latter low portion merging in similar fashion with the inner surface thereof in order to provide corresponding stop corners f^5 and f^6 whereby the swinging movements of the handle in both directions may be limited in a manner about to be described. The upper and lower walls of the recess G^4 are formed with horizontal bearing surfaces g^1 and g^2, while the inner connecting wall thereof is formed with a vertical bearing surface g^3, these three surfaces being so arranged in relation to the high and low portions of the cam element F^1 as to cause the latter, by operation of the handle F, to positively control the movements of the locking bolt E to and from its clamping position.

It should now be clear that, as the handle F is swung forwardly and upwardly from its normal position shown in Fig. 2, the high portion f^2 of the cam element F^1, first, will be carried out of its engagement with the vertical bearing surface g^3 of the block G, so as to permit the spring H to move the bolt E slightly rearward, as indicated by the dotted lines, and thus relieve the vise frame of its clamping pressure. Then, as the forward and upward movement of the handle F is continued, the high portion f^2 of the cam element F^1 will engage the lower horizontal bearing surface g^2 of the block G and thus tilt or rock the bolt E against the tension of the spring H about its fulcrum collar E^1 until the stop corner f^5 of the handle engages the upper wall of the recess G^4 in said block. As a result of this operation (see Fig. 3), the engagement of the notch *e* at the rear end of the bolt E with the rib d_1 of the banking stud D will be broken and permit the vise frame A to be swung forwardly by means of the handle F to its open position. At such time, as may be noted (Fig. 3), the low

portion f^3 of the cam element F^1 will be directly opposed to the upper horizontal bearing surface g^1 of the block G and sustain the handle F in a desirable position for lifting and pushing the vise frame back to its normal position against the banking studs D.

Finally, and assuming the parts to occupy the position shown in Fig. 3, as the handle F is swung downwardly and rearwardly to restore the bolt E to its locking position, the high portion f^2 of the cam element F^1, first, will be caused to break its engagement with the lower bearing surface g^2 so that the low portion f^3 of the cam element F^1 may function, by its engagement with the upper bearing surface g^1, to depress the front end of the locking bolt and thus raise the rear end thereof to reestablish its locking position in relation to the rib d^1 of the banking stud D. About the same time, the high portion f^2 of the cam element is carried into engagement with the vertical surface g^3 of the bearing block G so that as the handle F is forcibly pushed rearwardly to the position shown in Fig. 2, the high portion of the cam element will have arrived approximately at "dead center," where it is arrested by the engagement of the stop corner f^6 with the lower wall of the recess G^4. As a result, the locking bolt E is pulled slightly forward to clamp the rear wall of the notch *e* tightly against the rib d^1 of the banking stud and thus lock the vise frame securely in its normal upright position.

What is claimed is:

1. In or for a typographical machine equipped with a hinged vise frame and a banking stud for locating said frame in its normal position, a locking device for holding the vise frame against the banking stud, said device including, in combination, a fore-and-aft locking bolt mounted for pivotal and endwise movement to and from its locking position, a rotatable cam element pivoted to the forward end of the locking bolt and formed with two opposed low portions and an intermediate high portion, a recessed bearing block in which the cam element is mounted and which is open at the front, said block being formed with upper and lower horizontal bearing surfaces and with a rear vertical bearing surface for contact with the rotatable cam element, and a hand lever fastened to the rotatable cam element and operable to rotate it to two different positions within the recessed bearing block, said cam element in one of its rotated positions having its high portion arranged in engagement with the rear vertical bearing surface of the bearing block and its opposed low portions in engagement with the upper and lower horizontal bearing surfaces of said block to maintain the locking bolt in its locking position, and said cam element in the other of its rotated positions having one of its low portions in engagement with the upper horizontal bearing surface of the bearing block and its high portion in engagement with the lower horizontal bearing surface of said block to maintain the locking bolt in its unlocking position, the rotation of the cam element from the first mentioned position to the second mentioned position rocking the locking bolt from its locking to its unlocking position, and the rotation of the cam element from the second mentioned position back to the first mentioned position rocking the locking bolt from its unlocking to its locking position.

2. A combination according to claim 1, wherein the locking bolt is cylindrical and formed adjacent its forward end with an eccentric fulcrum collar fitted loosely within a cylindrical bore of the housing for the locking bolt.

3. A combination according to claim 2, including a compression spring located within the bore of the housing for the locking bolt and reacting against the eccentric fulcrum collar to bias the locking bolt upwardly and rearwardly.

4. A combination according to claim 1, wherein the pivotal connection between the locking bolt and the rotatable cam element is located above the longitudinal axis of the locking bolt.

5. A combination according to claim 1, including stops to limit the rotation of the rotatable cam element in opposite directions.

6. A combination according to claim 5, wherein one of said stops is positioned to arrest the cam element approximately at dead center when the locking bolt is in its locking position.

7. A combination according to claim 5, wherein one of said stops is positioned to form a rigid connection between the cam element and the recessed bearing block to enable the hand lever to be used as a lifting device in lowering and raising the vise frame when the locking bolt is in its unlocking position.

8. A combination according to claim 5, wherein one of said stops is formed by the merging of one of the low portions of the rotatable cam element with the outer surface of the operating hand lever.

9. A combination according to claim 5, wherein the two limiting stops are formed by the merging of the two low portions of the rotatable cam element with the outer and inner surfaces of the operating hand lever, respectively.

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