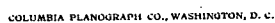


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2 SHEETS—SHEET 1.



F. WAITE.

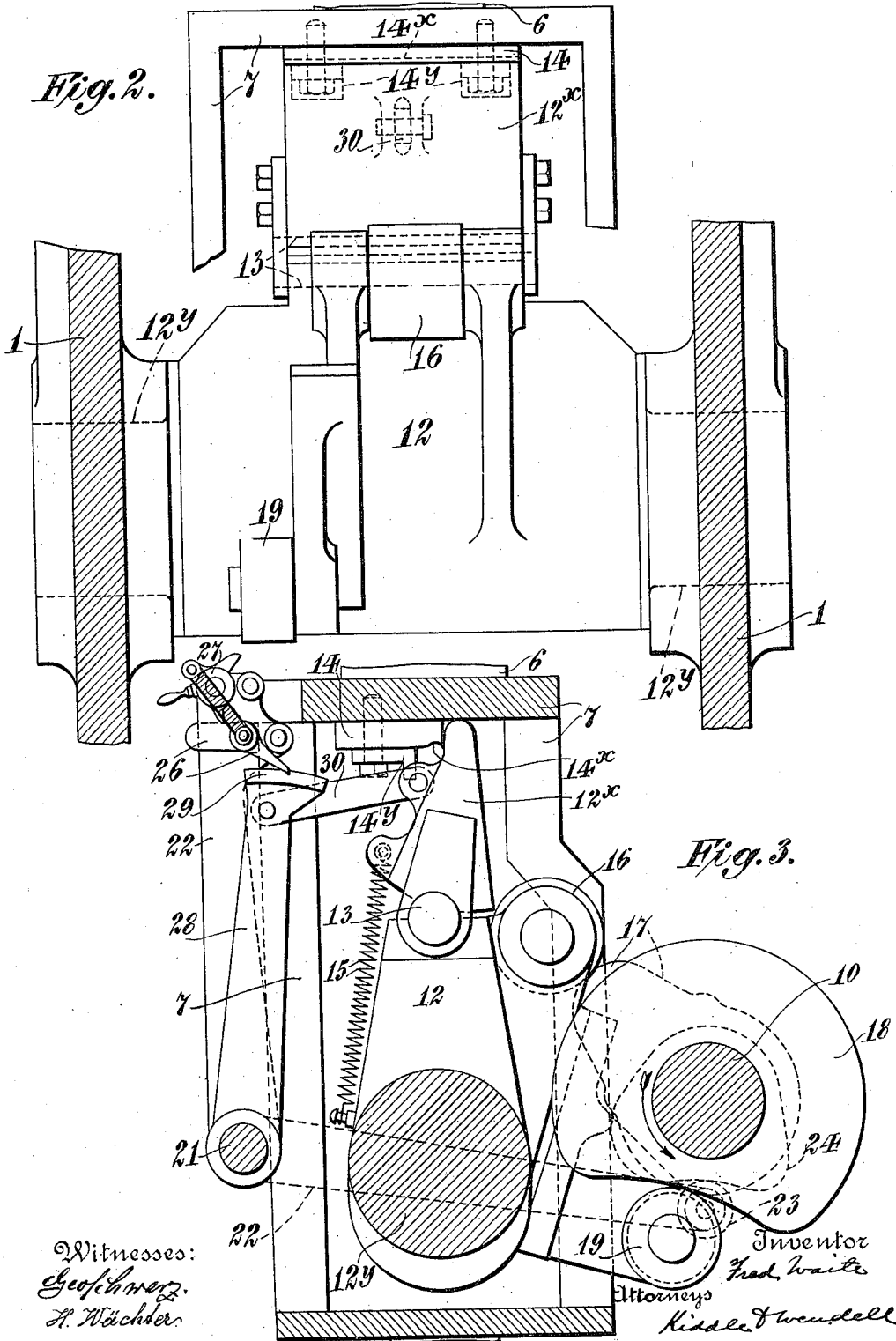
PRESS FOR PRINTING AND EMBOSsing IN RELIEF.

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Patented Nov. 12, 1912.

2 SHEETS—SHEET 2.

1,043,884.



UNITED STATES PATENT OFFICE.

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PRESS FOR PRINTING AND EMBOSSING IN RELIEF.

1,043,884.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed February 24, 1911. Serial No. 610,479.

To all whom it may concern:

Be it known that I, FRED WAITE, a subject of the King of Great Britain, and a resident of Otley, Yorkshire, England, have made certain new and useful Improvements in Presses for Printing and Embossing in Relief, of which the following is a specification.

In presses for printing and embossing in relief wherein the impression is given by a rising and falling plunger, it is necessary to provide suitable actuating mechanism for imparting the desired impression when the die carrier reaches the printing end of its stroke and also to so arrange the said actuating mechanism as to enable the impression to be checked instantaneously at the will of the operator; and the object of the present invention is to arrange an impression imparting and checking mechanism capable of performing the necessary functions in a smooth and efficient manner.

In carrying the invention into effect in connection with a press in which the die faces upward and is mounted in a die box on a carriage which carries the die to be inked and wiped and then comes to rest to receive the impression which is given by the die box being lifted up against a stationary counterpart, employment is made of a toggle-frame which is located between the side standards of the press and which is situated within the rising and falling plunger frame. The lower member of the said toggle-frame is fulcrumed in the side standards while the upper member thereof, which is knuckle-jointed to its lower fulcrumed member, is rounded at its upper end so as to normally engage within a recess formed in the underside of a bearing plate secured to the rising and falling plunger frame; and a spring is attached to the upper member of the toggle-frame which tends to turn it upon its knuckle joint downward upon the lower member, while on the back of the said lower member is mounted a roller running in contact with an operating cam situated on the main shaft of the press by which the said toggle-frame is straightened out at each rotation of the cam so as to impart an upward thrust to the plunger frame when the die carrier comes to rest at the printing end of the stroke to receive the impression thrust, in other words, there is imparted an upward thrust to the plunger frame intermittently

to time in with the movement of the die carrier. A second cam and roller mechanism is provided in connection with the toggle-frame so as to automatically release the impression. After the downward movement of the plunger has taken place and been arrested by a stop mounted on the fixed framework the toggle-frame continues to move sufficiently to disengage the upper toggle member from the bearing plate, during which period the upper member of the toggle-frame rests against a supporting plate which keeps it lineable with the bearing plate and prevents it being pulled forward by the spring.

In connection with a press in which the counterpart descends on to the die to make the impression, it is obvious that the plunger would carry the counterpart and that the aforescribed actuating mechanism would be inverted.

In conjunction with the toggle-frame and between the fixed framework is pivoted a bell-crank lever whose lower arm is fitted with a roller running in contact with a third cam provided on the main shaft, while the upper or opposite arm of the said bell-crank lever is provided with a pivoted trigger, which, on being operated, is caused to engage a disengaging lever or bar capable of throwing the upper member of the toggle-frame out of line with the bearing plate of the plunger frame; the arrangement being such that so long as the pivoted trigger is not operated the bell-crank lever simply rocks to and fro, while on the pivoted trigger being operated so as to connect the reciprocating bell-crank lever with the disengaging lever or bar the upper member of the toggle-frame is actuated so as to throw the same out of gear with the plunger frame and so check the impression. It is obvious that instead of causing the top toggle member to be moved so as to entirely miss engagement with the plunger in order to check the impression, the rounded end of the said toggle member might be pushed forward lineable with a second recess formed in the underside of the bearing plate which would cause the plunger to lift but to have much less movement; or instead of checking the impression by moving the top toggle member out of line with the bearing plate of the plunger frame, the checking could be effected by making the said bearing plate

slidable and connecting the disengaging lever or bar to the said slidable plate instead of to the toggle member.

The impression imparting and checking mechanism above described is not only applicable to presses in which the die is inked and wiped by being carried on a horizontally reciprocating carriage but also to presses in which the inking and wiping are effected by carrying the die on a rocking arm, in either case a reciprocating out-and-in movement to ink and wipe the die is obtained in combination with a rising and falling movement to impart the impression.

In order that the invention may be clearly understood, the same will now be described with reference to the drawings showing a specific embodiment of my invention in which the impression imparting and checking mechanism is applied to a press having the die facing upward and mounted in a carriage which carries the die to be inked and wiped and then comes to position to receive the impression which is given by the die box being lifted up against a stationary counterpart.

In said drawings: Figure 1 is a part sectional side elevation of a portion of the press, showing the impression imparting and checking mechanism with the parts in the unchecked position. Fig. 2 is a part sectional end elevation of the same impression imparting mechanism, and Fig. 3 is a sectional side elevation, showing the same impression imparting and checking mechanism with the parts in the checked position.

In the drawings, 1 designates the side standards of the press formed with the head 2 carrying the stationary counterpart 3.

4 represents the die which is mounted face upward in the horizontally reciprocating carriage 5 so as to be capable of being raised, when the die box in the carriage is at the printing end of its stroke, by the plunger 6 of the rising and falling plunger frame 7 working in top and bottom guides 8, 8' respectively.

9 indicates the driving shaft which imparts rotary motion to the main shaft 10 by means of spur gearing 11, all members of which are of ordinary construction.

In the machine shown in the drawings there is employed between the side standards 1 of the press and within the plunger frame 7 a toggle-frame consisting of a lower member 12 and an upper member 12^x, which lower member 12 is formed with trunnions 12^y by which it is fulcrumed in the side standards 1 of the frame of the press while the upper member 12^x is knuckle-jointed at 13 to the lower fulcrumed member 12. The free end of the upper member 12^x, which is rounded, normally engages within a recess 14^x formed in the underside of a bearing plate 14 secured to the plunger frame 7, and

the toggle-frame is provided with a spring 15 which tends to turn the upper member 12^x downward upon the knuckle-joint 13 toward the lower member 12. On the back and near the top of the lower member 12 of the toggle-frame is mounted a roller 16 running in contact with an operating cam 17 situated on the main shaft 10, which straightens out or closes the toggle-frame at each rotation of the cam so as to impart an upward thrust to the plunger frame 7, when the die carrier is at rest at the printing end of the stroke of the carriage 5, by which the desired impression is imparted. On the main shaft 10 a second cam 18 is provided which runs in contact with a roller 19 mounted on the back and near the base of the lower member 12 of the toggle frame. The sole function of the cam 18 is to cause an automatic release of the impression and thereby just start the plunger on its downward movement after which said cam 18 is inoperative as the weight of the plunger acts, indirectly through the upper and lower toggle members 12^x and 12 respectively, against cam 17.

When the plunger frame has moved down the desired distance or to the lowest desired position its further downward movement is arrested by a stop 20 provided on the fixed bottom guide 8. Now after the downward movement of the plunger has been arrested by the stop any further movement of the lower toggle member 12 from the position which it occupies when the plunger is held in impressing position will cause the upper end of the upper toggle member 12^x to disengage the bearing plate 14 and while disengaged said upper end rests against the supports 14^y, fixed to the bearing plate 14, which keep it lineable with said bearing plate and prevent it being pulled forward by the spring 15.

In conjunction with the toggle-frame and between the side standards 1 of the press is mounted a shaft 21 carrying a bell-crank lever 22 whose lower arm is provided with a roller 23 running in contact with a third cam 24 situated on the main shaft 10, which roller 23 is held in contact with the cam 24 by a spring 25, while the upper or opposite arm of the said bell-crank lever 22 is provided with a pivoted trigger 26 fitted with a spring-connected hand-actuated rocking plate or member 27. On the shaft 21 is loosely mounted the disengaging lever or bar 28 having formed at its upper end a notched-plate 29 and this lever or bar is connected to the upper member 12^x of the toggle-frame by a pivoted link 30, the arrangement being such that so long as the pivoted trigger 26 is held out of engagement with the notched-plate 29 of the lever or bar 28, the bell-crank lever 22 simply rocks to and fro, while on the pivoted trigger 26 being brought into engagement with the notched-plate 29 of the lever

or bar 28 it operates as a means to connect the reciprocating bell-crank lever 2 2 with the said lever or bar 28 whereby the upper member 12^x of the toggle-frame is actuated so as to be thrown out of gear or engaging position with the bearing plate 14 of the plunger frame 7 and thereby check the impression. The impression remains checked so long as the pivoted trigger 26 is in engagement with the notched-plate 29 of the lever or bar 28; while on the said trigger 26 being raised away from the said notched-plate 29, the spring 15 brings the free end of the member 12^x of the toggle-frame again into engagement with the recess 14^x of the bearing plate 14 of the plunger frame 7 to impart the impression.

It is obvious that various forms and modifications may be made without departing from the spirit and scope of my invention. I claim as my invention:

1. A die press having a counter-member and a die member relatively movable to and from work engaging position, said members arranged one above the other and the die member being movable to and from inking and wiping position in a direction transverse to the direction of relative movement of the members to and from work engaging position, a constantly operating shaft and means between the shaft and the lower one of the members which will cause it to move to and from work engaging position, said means capable of being rendered ineffective so that it will not cause said movement of said member, said press also having a stop to support the lower member in its lowest position.

2. A die press having a counter and a die member movable to and from impressing position, said members arranged one above the other and the die member also being movable to and from inking and wiping position in a direction transverse to the direction of movement to and from impressing position, a constantly operating shaft and means between it and the die member which will cause the die member to move to impressing position, said means also comprising a member operable at the will of the operator whereby it may be rendered ineffective to cause the movement of the die member to impressing position, the frame of said press provided with a stop to limit the downward movement of the die member.

3. In a die press the combination of a frame supporting a counter-member, a reciprocating plunger, a toggle member having one end connected to the frame and the other so that it can be placed in a position in a bearing on the plunger whereby it can reciprocate the plunger to and from impressing position by an opening and closing thereof and so that when bodily moved to another position relative to said bearing the plunger will not be reciprocated to and from

work engaging position, means for continuously opening and closing the toggle, and means for positioning that part of the toggle which is bodily movable relative to its bearing.

4. In a die press the combination of a counter and a reciprocating die carrying member coöperatively related thereto, means comprising a toggle for reciprocating the member, one end of the toggle being held so that in one position it can operatively engage an element on the die carrying member to cause a forward movement of the member, said element and the end of the toggle adjacent to the reciprocating member capable of movement relative to each other whereby the effective forward movement of the toggle will not be transmitted to the member, and means for effecting said relative movement between said element and the end of the toggle adjacent thereto.

5. In a die press the combination of a frame, a counter, a reciprocating member movable toward and from work engaging position and a toggle operating means between the frame and said member whereby the movement of the member toward impressing position may be effected by the closing of the toggle, said toggle means comprising a member therein which is movable to render the toggle ineffective to move the reciprocating member to work engaging position, and means for moving that end of the toggle which directly moves the reciprocating member relative to said member.

6. In a die press the combination of a frame supporting a counter, a die carriage supporting a die which is movable toward and from the counter, said carriage being also movable in a direction transverse to said movement of the die, means to effect the movement of the die toward and from the counter comprising a toggle which is continuously opened and closed by operating means between it and a continuously revolving shaft, means between the shaft and the means comprising the toggle adapted to move a member in said last mentioned means when operatively connected to said member whereby the means comprising the toggle will be rendered ineffective.

7. In a die press the combination of a frame supporting a counter, a reciprocating die member movable toward and from work impressing position, means for causing a movement of the die member in a direction transverse to the movement to and from die impressing position, means comprising a toggle for forcing the die member to impressing position, a continuously operated shaft having operative connections for causing alternate opening and closing of the toggle as the shaft rotates, a rocker arm pivotally mounted on the frame having one end operatively connected to the shaft in a man-

ner to vibrate the same, a disengaging bar pivotally connected to the frame and having a link connection with the free end thereof to one end of the toggle, the reciprocating die member carrying a member which may be engaged by the end of the toggle adjacent to the member when the toggle is in one position, and means between the second end of the rocker arm and the pivoted disengaging bar whereby when the said last mentioned end of the rocker arm and the bar are connected together the toggle member will be rendered ineffective to cause the movement to impressing position.

8. In a die press the combination of a frame supporting a counter, a reciprocating die member, toggle operating means therefor comprising knuckle jointed arms and means for continuously reciprocating the jointed portion of the toggle; said toggle member having a spring means connecting the arms, and the die member carrying a member with which one end of the toggle may be in slidable engagement as the toggle is opened and closed, and a means for positioning that end of the toggle which coöperates with the member on the die carrying member so that a bodily relative movement can be effected between said last mentioned end portion of the toggle and the member on the die carrying member which is engaged thereby.

9. In a die press the combination of a frame supporting a counter a rising and falling plunger for forcing the die to and from operating position relative to the counter, toggle operating mechanism carried by the frame and having one end arranged to engage the plunger and force it to raised position a stop carried by the frame to engage the plunger and support it in its lower position so that the toggle operating mechanism can be disengaged from the plunger.

10. In a press for printing and embossing in relief wherein the impression is given by a rising and falling plunger and in which the die box is given an in and out movement to ink and wipe the die and then comes to rest to receive the impression; mechanism for actuating the plunger so as to impart the desired impression, comprising a toggle frame and means for actuating the same intermittently to time with the movement of the die carrier, said toggle mechanism so arranged that one end is pivotally fixed to the frame and so that a member at the other end is free, the free member of said toggle arranged so that it becomes disengaged from the die plunger at each reciprocation of the latter, and means under the control of the operator for positioning said free member.

11. In a press for printing and embossing in relief wherein the impression is given by

a rising and falling plunger and in which the die box is given an in and out movement to ink and wipe the die and then comes to rest to receive the impression; mechanism for actuating the die plunger so as to impart the desired impression comprising a toggle frame and means for actuating the same intermittently to time in with the movement of the die carrier, said toggle mechanism being so arranged that the free member of said toggle becomes disengaged from the die plunger at each reciprocation of the latter; means for altering the relative position of the free toggle member with relation to that part of the die plunger which it normally engages so as to check the impression by causing said toggle member to fall to engage with the die plunger to give it less movement.

12. In a press for printing and embossing in relief wherein the impression is given by a rising and falling plunger in which the die box is given an in and out movement to ink and wipe the die and then comes to rest to receive the impression; mechanism for actuating the die plunger so as to impart the desired impression comprising a toggle frame and means for actuating the same intermittently to time in with the movement of the die carrier, said toggle mechanism being so arranged that the free member of said toggle becomes disengaged from the die plunger at each reciprocation of the latter; means for causing said disengagement between the die plunger and the free member of the toggle which are normally in engagement with each other so as to check the impression or to give it less movement when desired; the toggle frame being mounted between the side standards of the press and within the plunger frame, the lower member of said toggle frame being fulcrumed to the side standards and the upper member being normally in engagement with the recess formed in a bearing plate secured to the plunger frame, said toggle frame being provided with cam actuating mechanism by which it is straightened out at each reciprocation of the die box and then lowered so as to first bring the plunger frame down to a stop and afterward disengage the upper toggle member from the said plunger frame substantially as described.

13. In a press for printing and embossing in relief wherein the impression is given by a rising and falling plunger and in which the die box is given an in and out movement to ink and wipe the die and then comes to rest to receive the impression; mechanism for actuating the die plunger so as to impart the desired impression comprising a toggle frame and means for actuating the same intermittently to time in with the movement of the die carrier, said toggle mechanism being so arranged that the free

member of said toggle becomes disengaged from the die plunger at each reciprocation of the latter, means for changing the relative position of the free toggle member with relation to that bearing part of the die plunger which it normally engages so as to check the impression by causing said toggle member to fail to engage with the die plunger or to give it less movement; pivotally mounting on the side standards of the press a bell crank lever having one arm fitted with a runner in engagement with an operating cam by which it is reciprocated and providing the other arm of said bell crank lever with a pivoted trigger adapted to be brought into engagement with a checking lever or bar at will, said checking lever or bar being connected to the upper member of the toggle frame so that on the reciprocating lever being coupled to the checking lever the free end of said toggle member is

thrust out of engagement with the bearing plate of the plunger frame so as to check the impression.

14. In a die press the combination of a frame supporting a counter member, a reciprocating plunger having a toggle bearing portion thereupon, a toggle member having one end connected to the frame and the other end free to assume different positions relative to the bearing portion, means to continuously reciprocate the toggle to open and close the same, and means to move the free end of the toggle in and out of said bearing portion which is on the reciprocating plunger.

This specification signed and witnessed this ninth day of February 1911.

FRED WAITE.

Signed in the presence of—

FRED HAMMOND,
CHARLES FELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."