J. L. Kingsley. Sheet 1. 2 Sheets

Printing Press.

No. 3874. Patented Jan. 4. 1845.

Fig. 2

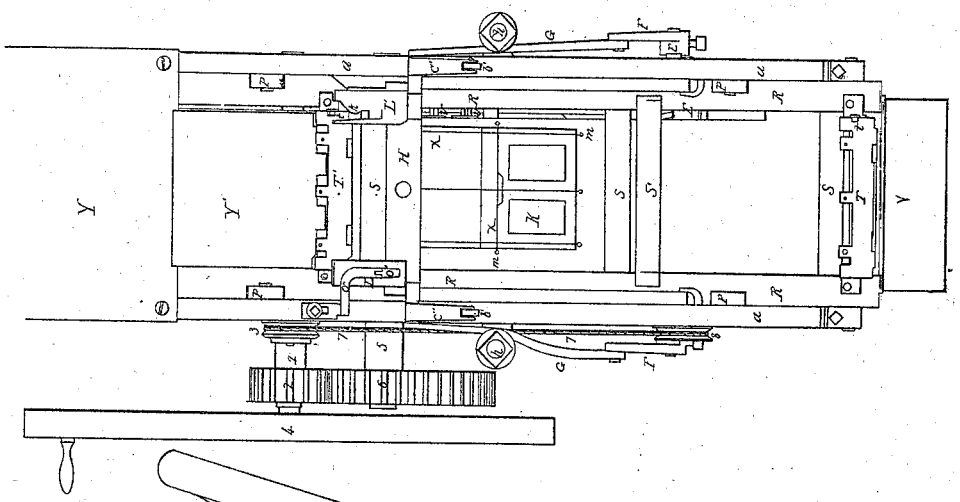
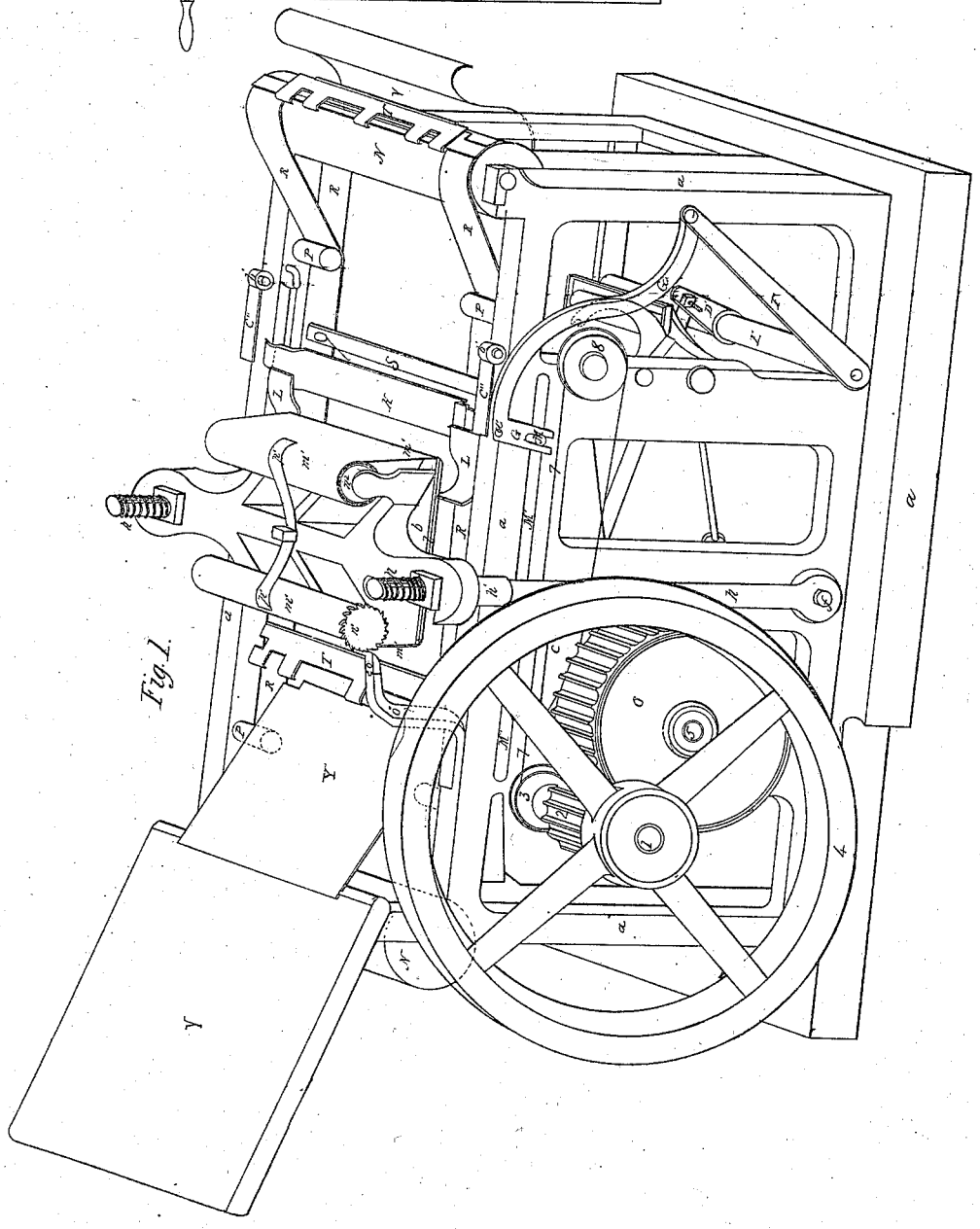


Fig. 1.



J. L. Kingsley. Sheets. 2 Sheets.

Printing Press.

No. 3874. Patented Jan. 4. 1845.

Fig. 4.

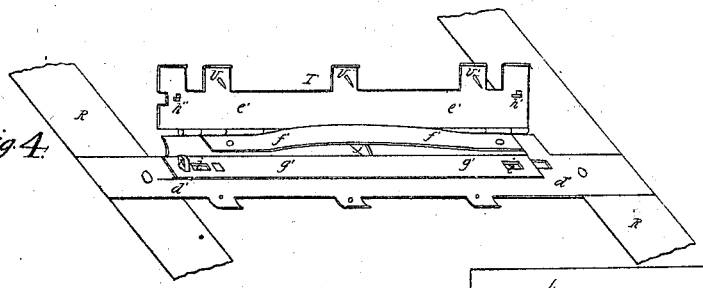


Fig. 3.

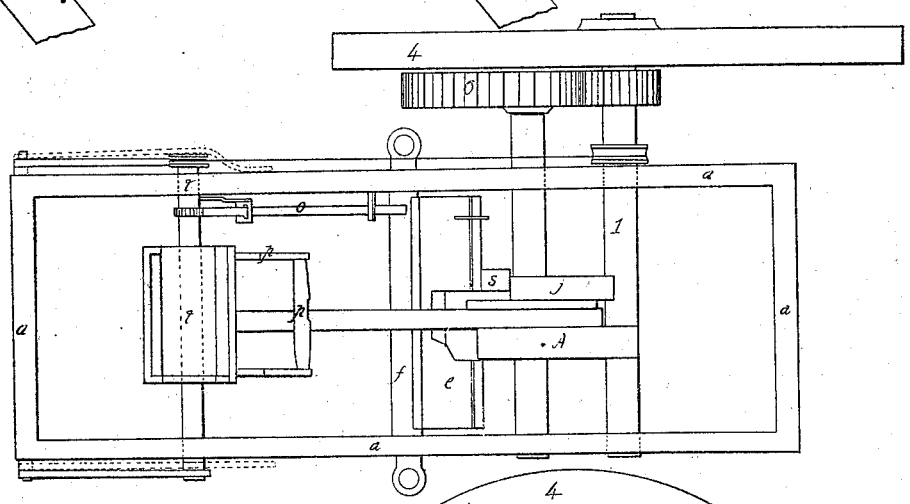
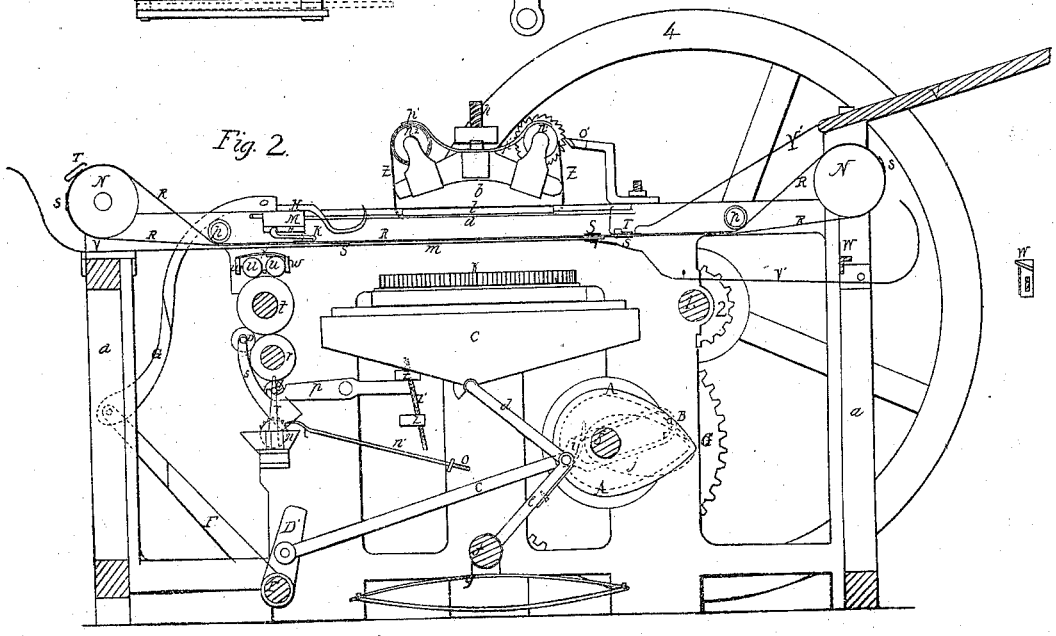


Fig. 2.



UNITED STATES PATENT OFFICE.

JOHN L. KINGSLEY, OF NEW YORK, N. Y.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **3,874**, dated January 4, 1845.

To all whom it may concern:

Be it known that I, JOHN L. KINGSLEY, of the city of New York, in the State of New York, have invented certain new and useful Improvements in the Bed-and-Platen Printing-Press, which I denominate "Kingsley's Perfecting-Press;" and I do hereby declare that the following is a full and exact description thereof.

In my improved press the inking apparatus and that for making the impression are in their general construction similar to those employed in the most approved machines; but they are so modified and arranged as to adapt them to an entirely new apparatus for conveying the sheets to the required positions for printing them on both sides, or what is technically called "perfecting" the sheets, which is done before the sheets leave the gripper by which they are deposited correctly in a pile ready for drying. By this arrangement one person only is required to feed the machine by supplying the sheets to be printed, the press being actuated by any adequate power. In a machine thus arranged one-half the labor of feeding required in the best registering-machine with which I am acquainted—namely, that of Tuft's, of Boston—is saved, and with the employment of two persons at the feeding-board his press affords only about six hundred impressions in an hour, while, as my machine takes two impressions to one sheet supplied and the printed sheet is deposited without interfering with the feeder or feeding, it may be run at any speed, which allows time merely for the inking and the supply of sheets, and may consequently make from twenty to twenty-five hundred impressions in an hour. My machine also secures perfect register, as the sheet which has been fed into the grippers does not leave them until it is perfected, when it is deposited as hereinafter described.

In the accompanying drawings, Figure 1 is a perspective view of the whole machine; Fig. 2, a longitudinal elevation thereof, the side frame being removed, so as to give a view of some of the working parts. Fig. 3 is a plan of the lower part of the machine, the upper part containing the form and sheet apparatus being removed. Fig. 4 is a separate view of one of the grippers, and Fig. 5 a top view of the machine with the platen removed.

In each of the figures where like parts occur they are designated by the same letters of reference.

a a is the frame of the machine, which may be best made of cast-iron.

b is the platen, and *c* the bed, shown as having on it a form of type K. The bed and platen are moved by toggle-joints *d e*, and these are sustained on a shaft *f*, which rests on elliptic or other springs *g* on either side of the press, by which springs the whole superincumbent weight is pressed upward and the toggles and bed kept in due contact. The shaft *f* slides up and down in slots in the lower part of the frame, and the platen *b* is suspended by rods *h h*, sliding in collars *h'*, and is attached to the shaft *f*. The toggle-joint is straightened and made to recede by means of a cam *j*, which operates on the shoe *i*, attached to the joint *e* of the toggle, and by this action the form is raised and the type made to bear on the sheet on one side, while the tympan *l*, attached to the platen, is brought down and made to bear on the other. The line of the meeting of these two parts is at the top of the frisket *m*. The movement of the toggle causes the bed to rise and the platen to fall, and vice versa, and the sheet apparatus is thereby allowed to pass between the frisket and the platen at the same time that the inking-rollers pass over the type.

The inking apparatus is, as usual, composed of several rollers for correctly distributing the ink.

In Fig. 2, *n* is a fountain-roller. This has a doctor or straight knife for regulating the surface of the ink, and it is made to move round by a ratchet and a rod *n'*, which is retracted by a spring *o* and moved forward by the toggle. *q* is a roller which receives the ink from *n* and carries it up to the roller *r*. The roller *q* has its gudgeon running in a frame *p p*, which is made to rise and fall, so as to shift *q* from one roller to the other by the rising and falling of the bed, the nuts *z z* on the screw-stem *z'*, which is made fast to the bed, effecting this object. The roller *r* has both a revolving and a traversing motion, the latter being caused by an oblique groove in one of its ends, into which a stationary pin passes, as in some other inking apparatus.

D is a roller supported on arms *s*, which roller revolves in contact with both *r* and *t*.

This latter roller gives their revolving motion to all the others, having a whirl on its end, which is driven by a band from the driving-shaft 1. The inking-rollers *u u*, which pass over the form, receive their ink from the upper side of the roller *t*. These rollers have their gudgeons in a frame *w w*, and they are covered by a plate *x* to prevent the sheet from coming into contact with them. The rollers that ink the form are carried over it by means of the same jointed arms F G on each side of the main frame that carry the sheet apparatus, to be presently described, their motion being simultaneous. The frame containing the rollers has grooves on its edges, which fit onto V-formed guide-pieces on the inside of the main frame. In Fig. 1 the arms F G are shown on the outside of the frame.

M is a pin projecting from the inking-roller frame through the slot M′ in the main frame and embraced by the arm G.

Although I have thus fully described the manner in which I have arranged and operate the inking apparatus, this has been done with a view to the exhibiting of its combination with the sheet apparatus upon which my claim to improvement is dependent, there not being anything substantially new in the former.

Motion is given to the machine by connecting the driving-shaft 1 with a steam-engine or any other adequate motive power. On this shaft is a driving-pinion 2, which gears into the main toothed wheel *b* on the cam-shaft 5. No. 4 is a fly-wheel on the shaft 1, and 3 a pulley on the same shaft, a band 7 from which embraces the pulley 8 and gives motion to the inking-roller *t*.

I will now proceed to describe what I denominate the "sheet apparatus," which is constructed and operated in the following manner:

A A is a cam on the cam-shaft 5 of such form and size as to adapt it to the giving of the required motion to the apparatus.

C is a shackle-bar, which connects the cam A with a rock-shaft E by means of an arm D′, where it is made adjustable. The shackle C has a longitudinal slot in it that admits the cam-shaft to pass through it, allowing a longitudinal but preventing all lateral play of the shackle. The cam A has a groove around it, which admits a friction-roller B, attached to the shackle. The rock-shaft E gives the proper traversing motion to the inking-rollers and to the sheet apparatus through the intermedium of the arms F and G on the outside of the frame.

H, Fig. 1, is a cross-head which slides back and forth within the sides of the main frame, being, like the inking-frame, furnished with V guide-pieces and grooves. It has a pin projecting from each of its ends, which enter holes in the upper end of the arm G, as seen at *a′*, Fig. 1, causing it to traverse therewith.

b′ b′ are friction-rollers connected to the cross-head by straps *c″ c″* and bearing on the side rails of the main frame. This cross-head, with the grippers and sheet, passes under the platen as the inking-frame recedes.

L L are closers attached to the cross-head, which serve to close the grippers upon the sheet and to bolt it in place, so as to cause the sheet to be held until the bolt is withdrawn.

The grippers T T, of which there are three, extend from side to side of the machine and are made fast to two endless belts R R, that pass over rollers N N at each end of the machine and under guide-rollers P P, which keep the two sides of the belt nearly in contact with each other in that part which is between them. There are also six cross-bars S S shown in the drawings, which extend from one belt to the other and are made fast thereto, serving to keep the belts in their proper positions. The cross-bars are to be acted on by the spring-hooks to be presently described. The belts R R, I intend to make of strips of spring-steel, similar to clock-springs; but although I believe this to be the best article I do not intend to limit myself to its use, but to use flat chains or belts of any material which may be found to answer the purpose.

By the foregoing arrangement the belts are divided into six equal parts, this division into six parts being so arranged as to bring a blank above and a sheet below the belts alternately, the grippers being placed on the alternating divisions of the belt. Under each end of the cross-head H there is a spring-hook K, Fig. 2, which hooks catch on one side of the cross-bars when the cross-head approaches the sheet that is being gripped, and as the cross-head recedes these hooks draw the endless belt forward, say, one-sixth of its length. The endwise register is thus perfectly secured. The belts by their motion carry the grippers with the sheet over the top of the frisket and below the line of movement of the cross-head and platen, and the truth with which this is done is insured by the close approximation of the two lines of belts between the two sides of the frame, thus preventing all lateral deviation, the guide-rollers P P effecting this object.

Fig. 4 represents one of the grippers as I construct them. It is shown as open and attached to the belts R R by its lower half *d′ d′*. To this is hinged the fly or upper portion *e′ e′*. This, when disengaged from the part *d′*, is thrown and held open by a spring *f′ f′*. When closed, the parts are held together by a sliding bolt *g′ g′*. The fly has hooks *h″ h″* on it, which pass through holes *i′ i′* in the belt, the latter being moved back and forth at the proper time in a manner to be presently described. *j′* is a spring bearing against the side of the bolt to prevent it by its friction from jarring out of place. U′ U′ are pins which pass through the sheet and

into holes in the part d'. Spring-catches may be substituted for the bolt g', and may be made to produce a like effect.

Fig. 5 is a top view of the machine with the platen removed and with one of the grippers T′ ready to receive a sheet. m is the frisket, which does not differ materially from those now in use. It is united to the protection-board V at one end of the machine and to the deposit-board V′ at the other end, where the sheets are deposited after being perfected.

Y is a feed-board, on which the unprinted sheets are placed. Y′, which is jointed to and makes a part of this, is a drop-piece, which allows the sheets to slide down to the grippers, while it is capable of rising to allow of the return of the grippers when open. L L′ are the two closers, which are shown as having partially depressed the fly of the grippers. The closer L′ acts upon the pin, which rises from the bolt g' and causes it to engage with the hooks h'' h'', Fig. 4. This it effects by means of the curved slot or opening k, and the sheet is consequently held until the bolt is retracted, which is done when the printed sheet is ready to be deposited in the compartment V′. The bolt g' of the grippers is retracted by means of an inclined piece of metal placed on the frame in the situation shown at W, Fig. 2, (shown in perspective at W′,) its sloping top retracting the bolt, and this being done the sheets as they are perfected will be regularly piled upon each other.

The form of type is in part seen in Fig. 5, as is also the cover x x of the inking-rollers, which have nearly arrived at the end of their journey previous to their return over the form.

Having thus fully described the nature of my improvement in the sheet apparatus, I will now describe that which I have made in the management and arrangement of the tympan or offset sheet. This improvement consists in the employment of a sheet of paper of great length as a tympan-sheet. To receive this sheet there are two rollers, which are placed above the platen or in any other convenient situation. One end of the tympan-sheet is passed round or otherwise attached to one of these rollers, and the remainder of the sheet, with the exception of what passes under the tympan, is wound upon the other roller. Upon one end of the first roller there is a ratchet-wheel, which is operated on by a jointed feed-hand after taking each impression, by which device the roller is made to revolve to a short distance, winding a portion of the tympan-sheet from the opposite roller onto itself, and consequently shifting it on the face of the tympan, thereby obviating the difficulty and loss of time which have to be encountered in renewing tympan-sheets as ordinarily used, and removing all temptation to its continued use when it ought to be changed.

In Fig. 1, m' m' is the long sheet of tympan-paper which passes round the rollers n' and n^2 and under the tympan l. With the teeth of the ratchet on n' a jointed feed-hand o', working on a joint-pin on the stationary arm o'', engages, and as the platen descends the ratchet is turned and the tympan-sheet shifted to the required distance. The rollers are prevented from turning too loosely by means of a spring p' p', the ends of which are made to bear upon the rollers or upon the paper around them.

I will now give a summary of the operation of this machine, which may be deduced from what has already been said of its respective parts, but will be more readily understood by being thus brought together. The rollers of the inking apparatus are kept constantly revolving by means of the band from the driving-shaft, with the exception of those that ink the form, which revolve during that part of their operation by their contact with the type. As these latter rollers return on the form they are followed by the sheet last fed into the grippers, which sheet is arrested when it arrives over the form, and continues at rest during the time that the impression is taken—that is, while the toggle-joint levers are straightened and drawn back by the action of the cam—the impression being thus taken on the first side of the sheet. At the next journey of the inking-rollers over the form a fresh sheet is not fed into the grippers; but on their having completed their operation a sheet which had been printed on one side and which had been carried under the rollers N N by the endless belt is brought over the form by the motion of the belts, its blank side being of course toward the type. The toggle is then brought into action, as before, and the second side of the sheet is printed. The next action of the press brings one of the grippers up to the feeding-board and a fresh sheet is fed ~~in~~. At the same time a perfected sheet is brought over the deposit-board and the gripper which held it is opened by the retracting of the bolt g'. The moving tympan or offset sheet, which passes under the tympan, receives the offset of the ink when the second side is being printed, and as its movement at every impression prevents its receiving two offsets in exactly the same place the backs of the sheets are kept equally clean with the front.

The machine as I have described it is adapted only to the printing half-sheet wise; but by obvious variations in the arrangement of the parts it may be adapted to the printing of sheetwise forms, while many of the leading features of novelty will be retained. Instead of perfecting the sheets at one operation they may be fed in at one end of the press and deposited at the other, and the form being subsequently changed the operation on them may be repeated; or there may two beds and two platens to be operated on successively, one of them printing the first side of the sheet, as in the above-described press, and the other printing it as it is carried below the belts.

Having thus fully described the nature of my invention, and shown the whole construction and operation of my machine, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The arrangement of the grippers, combined with the carrying-belts, by which I am enabled to carry in the paper, hold it, and retain it until it is perfected by being printed on both sides, and then deposit it, these operations being effected by so combining the sheet apparatus with the inking-rollers as to give to the carrying-belts and grippers an intermitting progressive movement, as described.

2. In combination with the printing apparatus, the so arranging of the carrying-belts as to return the sheets of paper which have been printed on one side at nearly the same level which they occupied when they received the first impression, they being in both cases at the proper elevation for giving the impression, as described.

3. The manner in which the grippers are made to open and close by means of a spring operating like that marked *f'* to force and hold them open, and a bolt for holding them when closed, in combination with the closer and opener, substantially as set forth.

J. L. KINGSLEY.

Witnesses:
THOS. P. JONES,
P. ENGARD DUNNET.