Sheet 1. 2 Sheets

T. H. Dodge.

Printing Press.

No. 8521. Patented Nov. 18. 1851.

Fig. 1.

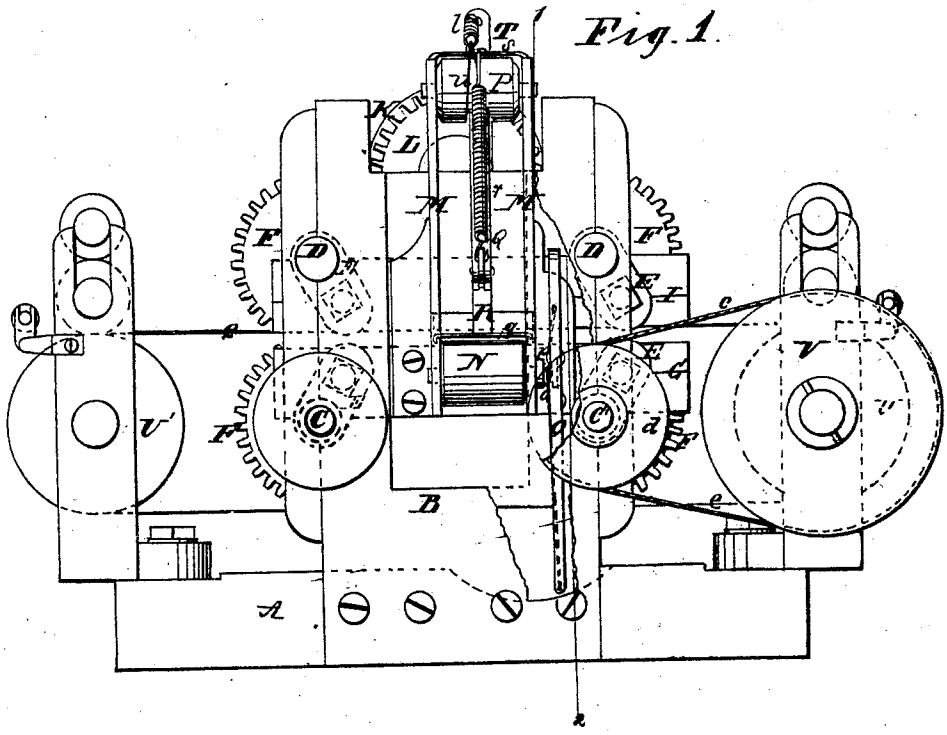
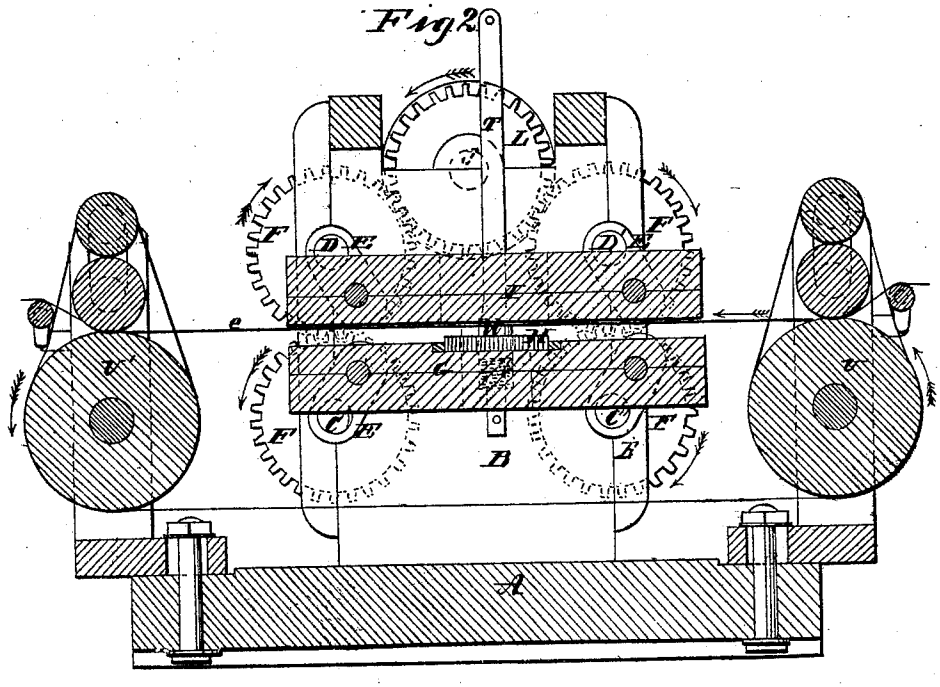


Fig 2.



T. H. Dodge. Sheet 2 2 Sheets.

Printing Press.

No. 8521 Patented Nov. 18. 1851.

Fig. 3.

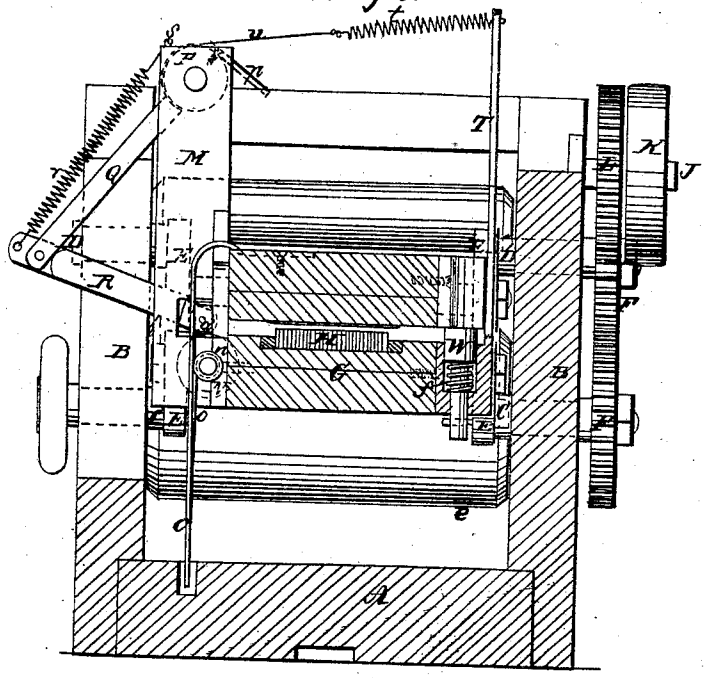


Fig. 4.

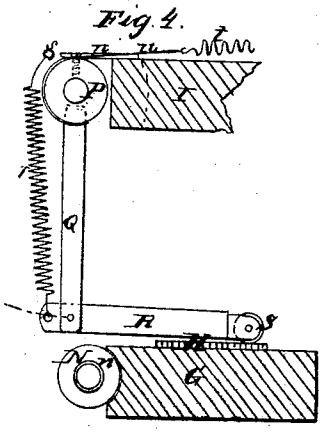


Fig. 5.

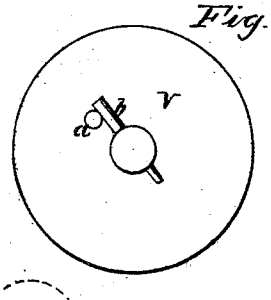
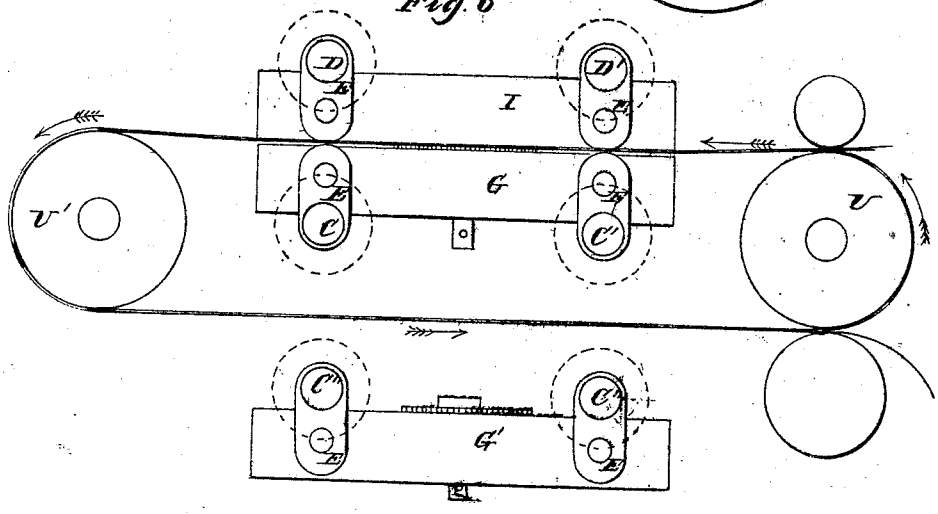


Fig. 6



UNITED STATES PATENT OFFICE.

THOMAS H. DODGE, OF NASHUA, NEW HAMPSHIRE.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **8,521**, dated November 18, 1851.

To all whom it may concern:

Be it known that I, THOMAS H. DODGE, of Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a press suitable for job-work, or work in which only one side is printed, part of the framing being broken away to show the inking apparatus. Fig. 2 is a longitudinal vertical section of the same, taken near its center. Fig. 3 is a transverse vertical section taken in the line 1 2 in Fig. 1. Fig. 4 is a detached view of the inking apparatus. Fig. 5 is a detached view of the pulley which drives the feed-cylinders.

Similar letters of reference indicate corresponding parts in each of the several figures above mentioned.

The nature of my invention consists in hanging the platens and type-beds of printing-presses on cranks on parallel shafts which are so arranged that the platens and type-beds are always parallel or nearly parallel to each other during the revolutions of the shafts. Those shafts which carry the type-beds revolve in an opposite direction to those which carry the platens acting in connection with them, and the cranks on one set of shafts are so arranged upon them in relation to those of the outer set acting with them that each platen moves in the same direction longitudinally as the type-bed corresponding with it, and both move either toward or from each other, being brought together sufficiently close to take the impression of the type on a sheet placed between them. The sheet upon which the impressions are taken should be in a long roll and fed in continuously at the same speed as the motion of the type-bed and platen, and an impression is given to it by the meeting of the type-bed and platen at every revolution of the cranks, the printed sheets being cut off after leaving the press. To insure the speed of the sheet being precisely the same as that of the bed and platen at the time of making the impression, there is a spring-presser attached to the bed, which takes hold of the band which drives the rollers for feeding the sheet and either retards or accelerates its motion, as may be necessary.

The type is inked before every impression by an inking-roller whose motion is controlled by the motion of the bed or platen.

To enable those skilled in the art to make and use my invention, I will proceed to describe fully its construction and operation.

A B is the framing of the machine, A consisting of a foundation-plate, and B of upright standards mounted upon the same.

C C′ and D D′ are short shafts hung in bearings in the standards of the frame, each being formed in two parts, one on each side of the frame in line with each other, so that both have the same axis. The axes of all are parallel, and C and D are at the same distance apart as C′ and D′, C and C′ being in the same horizontal line and D and D′ being also in the same horizontal line. Upon each part of the said shaft inside the bearings is a crank E. All the cranks are of equal length, and those having the same axis are arranged opposite each other, so as to form parts of the same crank. The cranks upon C and C′ are placed in corresponding positions and the type-bed is hung upon them. Those upon D and D′ are also placed in corresponding positions and the platen is hung upon them.

The shafts C and D are geared together by a pair of cog-wheels F F, and those C′ and D′ are geared together by a similar pair of cog-wheels, so that C and C′ must rotate in opposite directions to D and D′, the wheels gearing so that the cranks on C and C′ and those on D and D′ always move toward or from each other at the same time, and when one pair is turned upward in a vertical position the other pair is turned downward, and vice versa.

G is the type-bed, consisting of a strong plate hung on the cranks on the shafts C and C′, being always kept in a horizontal position during their revolution. H is the form of type placed upon the bed in the usual way.

I is the platen, consisting of a strong plate hung upon the cranks on the shafts D and D′, always remaining in a horizontal position.

J is a stationary stud or gudgeon secured in the side of the framing and having the driving-pulley K running loosely upon it. To the driving-pulley a cog-wheel L is secured,

which gears into the wheels F F on the shafts D and D′, driving both in the same direction.

M M are standards secured to one side of the type-bed for the purpose of supporting several of the parts of the inking apparatus.

N is the distributing-roller hung in bearings in the lower parts of the standards M M. The upper part of its periphery stands nearly level with the top of the type-bed. The side of the type-bed is recessed (see Fig. 4) to allow the top part of the roller to come nearly close to the bed. On the axis of the roller there is a small grooved pulley *n*.

O is a small bar of steel or other flexible material attached to the platen and hanging down from it. A small cord *o* is attached to it at or near its upper and lower ends. This cord is also made to encircle the pulley *n*, and by the upward and downward motion of the platen and type-bed a reciprocating rotary motion will be communicated by it to the distributing-roller.

P is a small barrel or cylinder hung in bearings in the upper part of the standards M M. It carries a radial arm Q, at the end of which is hung a lever R, having a long and a short arm. The long arm carries a small frame or bar, in which the inking-roller S is hung. The short arm is connected by a spiral spring *r* to a small bar *s*, placed across the standards. This spring has always a tendency to throw down the inking-roller. A small tangential bar *p* is secured to the barrel P, which bar is struck by every upward motion of the platen and thrown upward, giving the barrel part of a revolution, by which the arm Q is thrown toward the press, and the inking-roller, which rests upon the distributing-roller when not in use, is moved across the type, the spring *r* always keeping it down upon the type. An upright bar T is secured to the type-bed on the opposite side, and to it is appended a spring *t*, attached to a cord *u*, which passes over and is secured to the barrel P. This spring *t* has the effect of pulling on the cord and turning the barrel (when the bar is not being operated upon) sufficiently to throw back the inking-roller to the distributing-roller, beyond which it is prevented from moving by its frame coming in contact with the standards M M.

U U′ are cylinders hung in bearings in standards at each end of the frame. U carries a pulley V on its shaft, which is fitted to it so as to turn freely, driving the cylinder by a stud *a* on its face, which comes in contact with a pin *b*, (see Fig. 5,) inserted transversely in the shaft. The pulley receives its motion by a band *c* from a pulley *d* on the shaft C′. U′ is driven by a band *e*, running from U. Tapes run over these cylinders for the purpose of carrying the paper, which may be placed on a roller attached to the machine, or may be otherwise conducted to the carrying-tapes.

The mode of carrying the paper forms no part of the invention, therefore needs no further description, save that the sheet should be carried parallel with the faces of the type-bed and platen and about midway between their centers of motion.

W is the spring-presser, which consists of a stud fitting in a socket secured on one side of the type-bed. The lower part of this stud is made smaller than the upper part to form a shoulder, and under this shoulder, encircling the stud, a spiral spring *f* is placed in the socket, which forces up the stud, but at the same time allows it to yield to pressure, causing it to stand up above the face of the type-bed at a point exactly under the upper part of the band *e*. Every time the type-bed and platen approach one another the presser comes in contact with the band and presses it up against the under side of the platen or of a plate secured to it, and thus holds the band so that it, and consequently the sheet, must move at the same speed as the type-bed and platen. If the speed of the cylinders U and U′, which is adjusted as nearly as possible to the speed of the type-bed and platen, should be too slow, the manner in which the pulley V acts on U admits of its being moved faster; but if it should go too fast the speed of the band, and consequently of the cylinder U′, will be temporarily retarded.

The operation of printing is peformed in the following manner: Rotary motion is given to the driving-pulley and cog-wheel L in the direction of the arrow shown near them in Fig. 2, and by the cog-wheel L to the several wheels F F, which, with their shafts and the cranks upon them, revolve in the directions pointed out by the arrows shown near their peripheries. This gives motion to the type-bed and platen, every part of both of which in its motion describes a circle. These by the positions in which the cranks are arranged always move in the same direction longitudinally or horizontally. The sheet or roll to be printed on, which is represented by a blue line in Fig. 2, moves in the same direction as the type-bed and platen when they are nearest to each other, which is indicated by a blue arrow, and the type-bed and platen being at such a distance apart as to meet during every revolution of the cranks will by their meeting give the impression of the type to the sheet, which continues traveling onward after the type leaves it. The platen just before reaching its highest position comes in contact with the tangential bar *p* on the barrel P and pushes it upward, moving it from the position shown in Fig. 3, where the inking-roller is shown resting on the distributing-roller, to the position shown in Fig. 4, where the inking-roller is supposed to have moved forward across the form and the platen is about to descend and release the bar *p* and leave the barrel P free to be acted upon by the spring *t* and cord *u*, which throw back the inking-roller to the distributing-roller. This

motion takes place previous to every meeting of the type-bed and platen and gives the proper quantity of ink to the type.

If the speed of the peripheries of the cylinders U and U′ be properly regulated, the roll must travel at the proper speed; but owing to the probability of the driving-band slipping or other accident it is necessary to insure its motion being the same as that of the type by the spring-presser W.

The cutting off of the sheets to the proper length after printing may be performed by an apparatus attached to the press, or the roll may be carried to a detached cutting apparatus.

Fig. 6 in the drawings exhibits the addition of another type-bed G′ to the two already described. It is hung on cranks on shafts C″ C‴, similar to those already described, and operates in the same relation to G as G does to I, the under side of G forming the platen operating in connection with it. The type-bed G′ is added for the purpose of printing the opposite side of the sheet to that printed by G. The roll in this case is supposed to be fed over the cylinders in the same way as before described; but instead of leaving the upper side of U″ it is carried by tapes under it and passes in the opposite direction over the type-bed G′, presenting its opposite side to it. An additional inking apparatus and spring-presser will have to be provided and all the parts will have to operate in the same manner as in the job-press, this modification being suited for book and newspaper work. The construction and operation of the former one being intelligible, it is presumed that this diagram and description will enable any person of competent skill to understand the latter.

Having thus fully described the nature, construction, and operation of my invention, I will proceed to state what I claim and desire to secure by Letters Patent—

1. Hanging the type-bed and platen upon cranks on rotating shafts C C′ and D D′, arranged and operating in the manner substantially as herein described.

2. The spring-presser W, attached to the type-bed or platen for the purpose of pressing the band *e*, communicating motion to the sheet, against the opposite surface of the platen or bed and causing it to be moved at precisely the same speed as the bed and platen, substantially as described.

3. The arrangement for carrying and giving motion to the inking-roller, consisting of the barrel P, the bars Q and *p*, the lever R, springs *r* and *t*, and band *u*, combined together and with the above type-bed and platen, in the manner substantially as set forth.

THOMAS H. DODGE.

Witnesses:

MELBERN F. ELDREDGE,

AARON F. STEVENS.