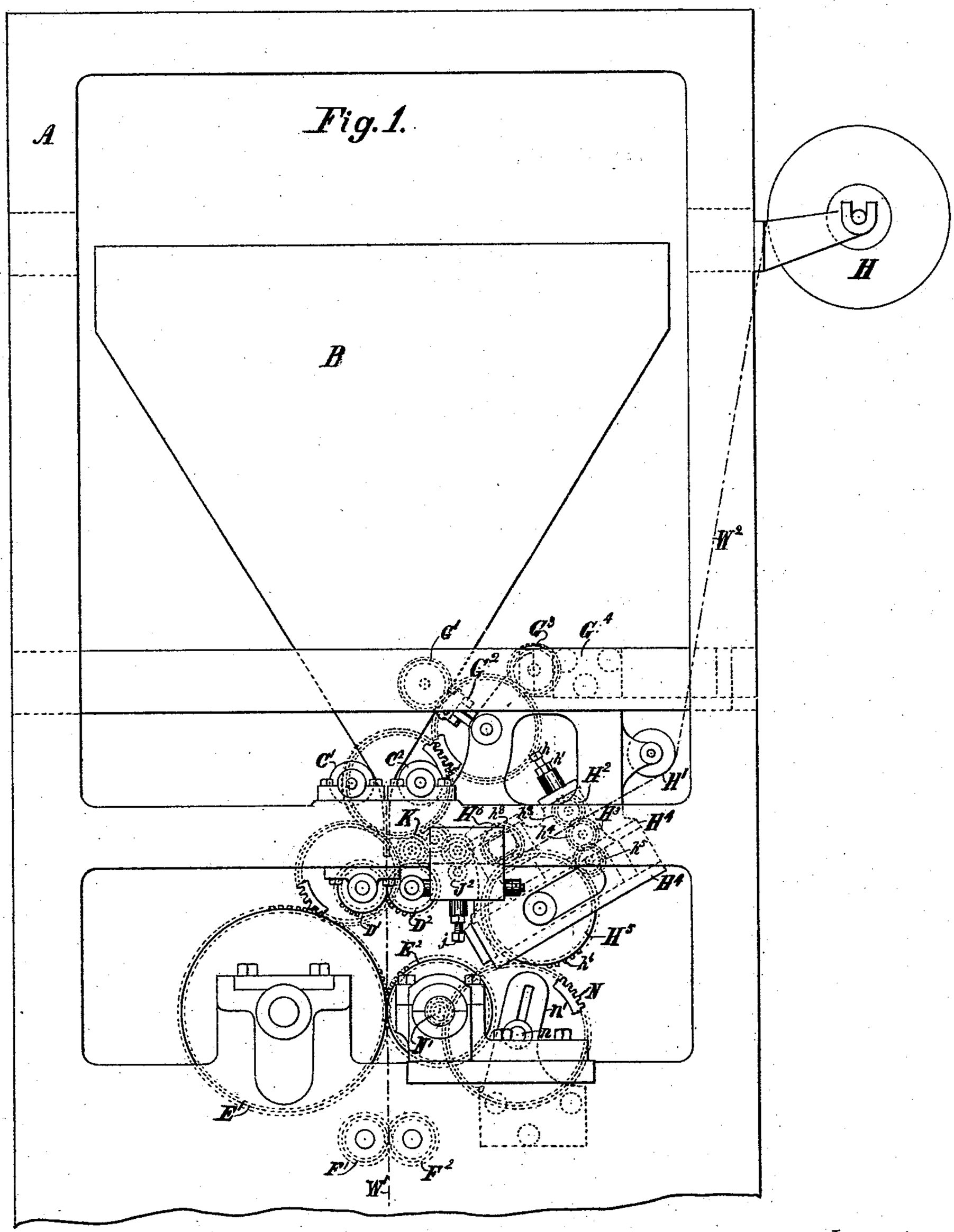
(No Model.) 3 Sheets—Sheet 1.

G. W. TURNER.

WEB PRINTING PRESS.

No. 572,283. Patented Dec. 1, 1896.

Fig. 1.



Witnesses.
E. Phillips
J. Littlejohn

Inventor
George W. Turner
by his Attorney
Edwin H. Brown

(No Model.) 3 Sheets—Sheet 2.

G. W. TURNER.

WEB PRINTING PRESS.

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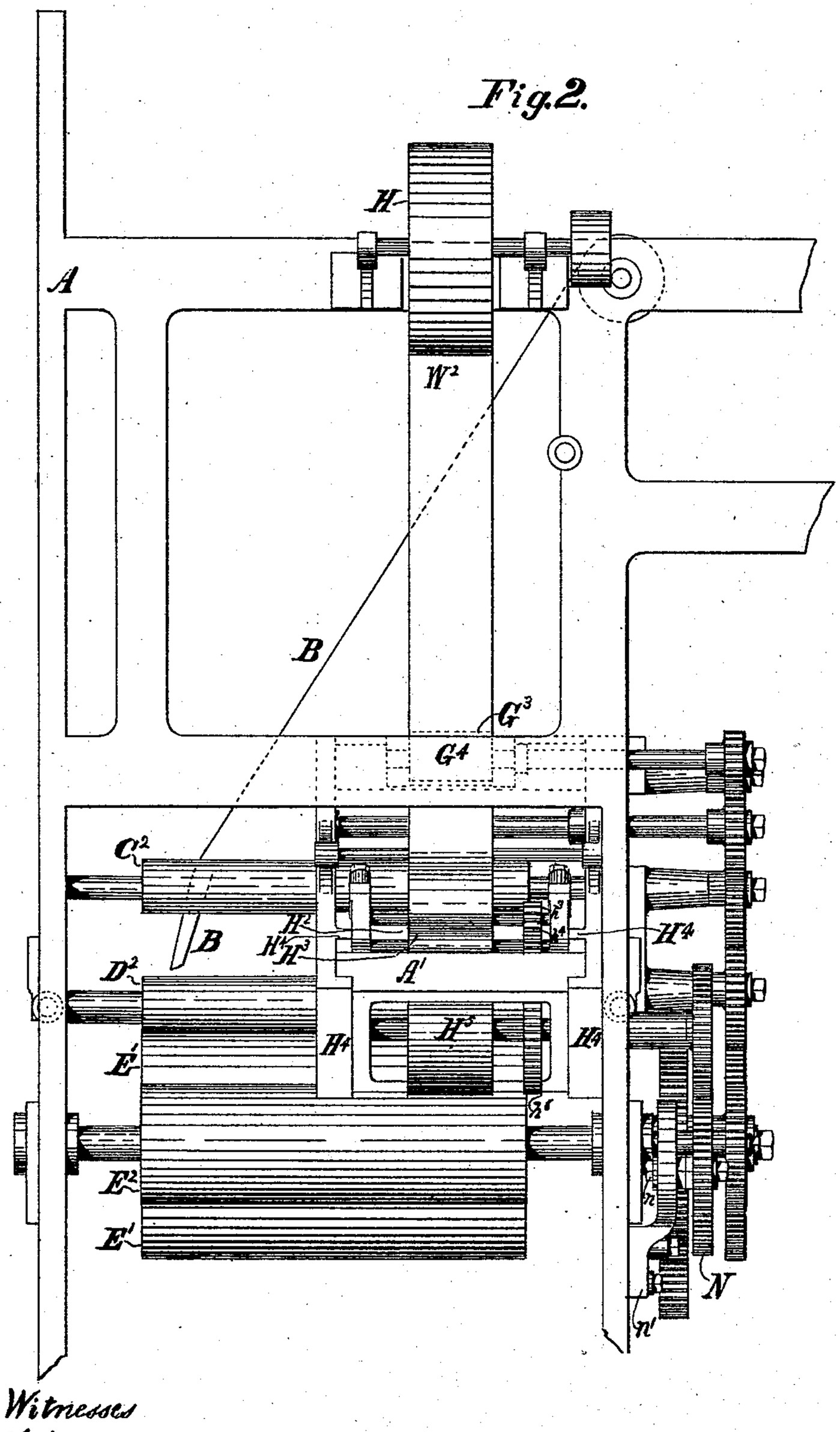
Fig. 2.



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(No Model.)

3 Sheets—Sheet 3.

G. W. TURNER.

WEB PRINTING PRESS.

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Fig. 4.

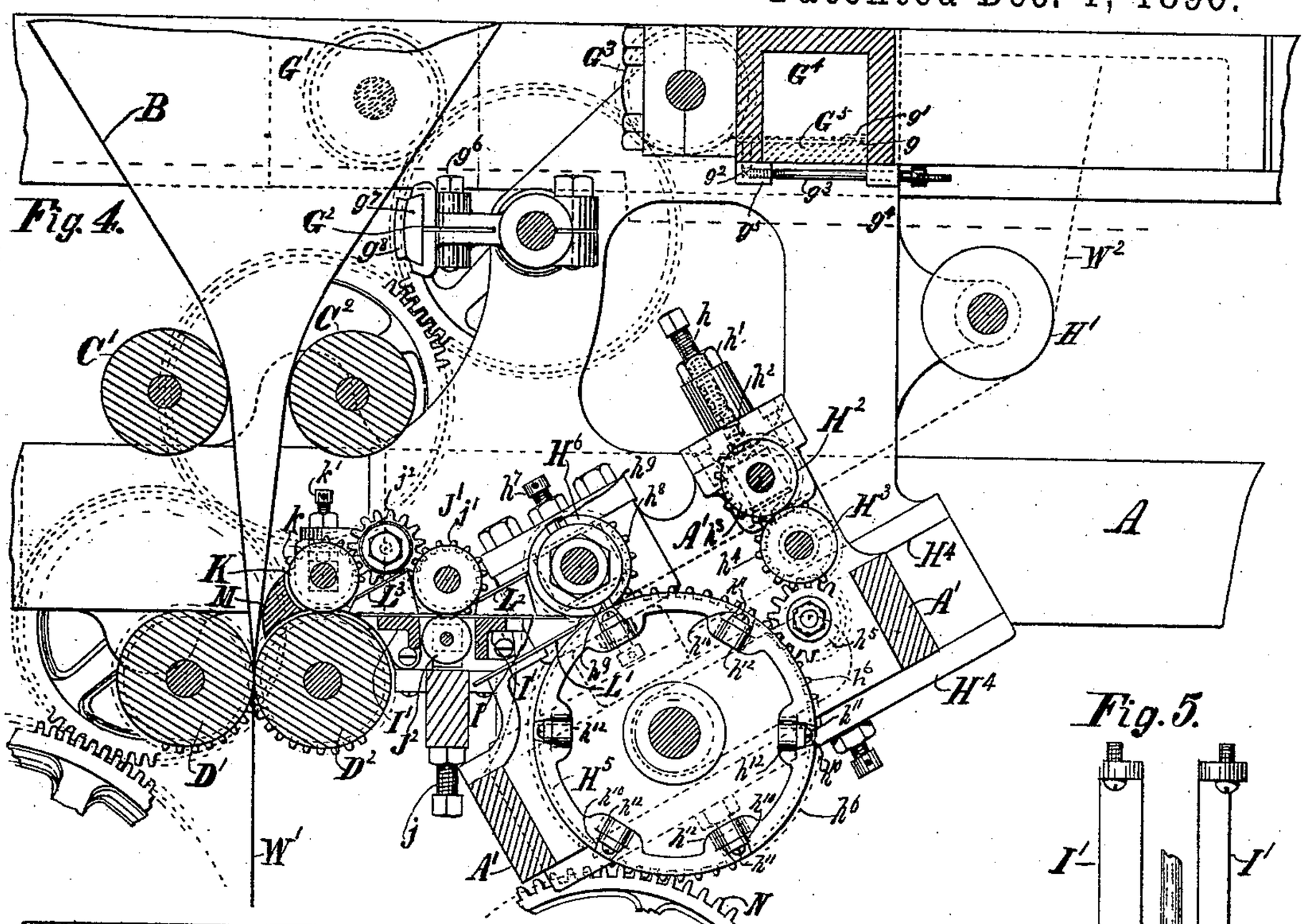


Fig. 5.

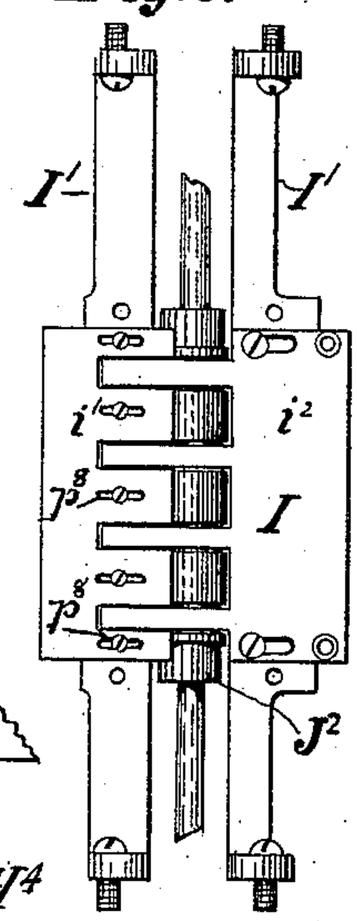
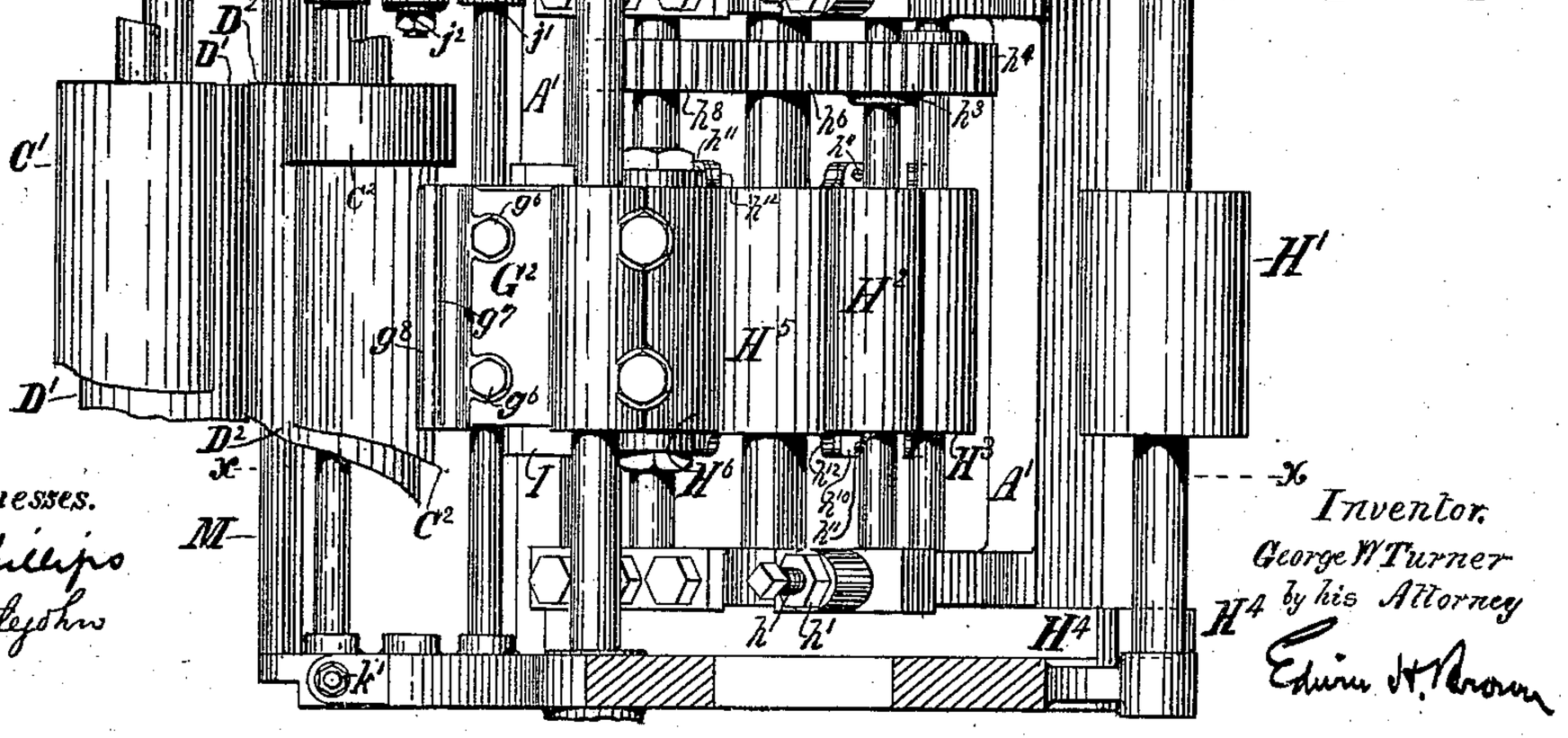


Fig. 3.



Witnesses.
E. Phillips
J. Littlejohn

Inventor.
George W. Turner
by his Attorney
Edwin H. Brown

UNITED STATES PATENT OFFICE.

GEORGE W. TURNER, OF BROOKLYN, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

WEB-PRINTING PRESS.

SPECIFICATION forming part of Letters Patent No. 572,283, dated December 1, 1896.

Application filed September 23, 1890. Serial No. 365,899. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. TURNER, of Brooklyn, Kings county, and State of New York, have invented a certain new and useful Improvement in Printing-Presses, of which the following is a specification.

It is frequently desirable that newspapers be accompanied by supplementary matter and that such supplementary matter of certain classes, such as illustrations, should form a part of the matter on a page of the main sheet, but not be printed on the main sheets, but be printed on a separate sheet and this attached to the main sheet after the latter is printed. It is generally preferable also, especially in the case of illustrations, that this supplementary matter should form a part of the front page of the main sheet.

The object of my invention is to provide means whereby newspapers or like articles may readily be provided with small sheets containing such supplementary matter, and especially to provide means for securing such sheets to the front page of a newspaper or like article.

Where newspapers or like articles are printed from a web of paper the supplementary matter will preferably be also printed from a web. Then the portion of the web forming each newspaper or like article will be cut off and folded, and the portion of supplementary matter on the other web designed for attachment to the folded newspaper or like article will be cut off and fastened to the front sheet of the newspaper or like article. The supplementary matter for each newspaper or like article may vary in size relatively to the front sheet of the newspaper or like article, and when this is the case variations in the operation of the machine will be necessary to insure the attachment of the supplementary matter to the same place on all the newspapers or like articles.

Having indicated the general object and nature of my improvement, I will describe in detail the particular example of the improvement which I have illustrated in the accompany drawings.

Figure 1 is an elevation of a portion of a web-printing press and of parts applied thereto and embodying my improvement. Fig. 2 is a side view of the parts shown in Fig. 1. Fig. 3 is a plan or top view, on an enlarged scale, of the parts embodying the improvement. Fig. 4 is a vertical section of the parts embodying my improvement on an enlarged scale and taken parallel to Fig. 1 and in the plane of the dotted line *x x*, Fig. 3. Fig. 5 is a plan view of a table comprised in the machine.

Similar letters of reference designate corresponding parts in all the figures.

A designates part of the frame of a web-printing press.

B designates the former of a longitudinal folder commonly called a "cow-catcher," over which a web W′ after printing is doubled or folded longitudinally. This part may be of the ordinary or any suitable construction. As shown, it consists of a sheet of metal which has its side edges folded or bent rearward on converging lines, whereby it is made to taper downwardly and cause the bending of the web longitudinally at a point midway between the side edges, so that it will be doubled in the middle. The web during this folding operation passes between the former B and two rollers C′ C², which are journaled in bearings provided on cross-pieces of the frame A. These rollers are adjacent to the lower portion of the former. It will be seen that the former inclines forwardly as it is bent rearwardly. Owing to this the web when doubled will be presented between the rollers C′ C² practically throughout the whole length of the latter. Below the rollers C′ C² of the longitudinal folder are rollers D′ D², which are journaled in bearings fastened to cross-pieces of the frame A and receive the folded web after it leaves the longitudinal folder. It is these rollers which cause the movement of the web over the longitudinal folder. The roller D² is capable of adjustment toward and from the roller D′ to secure the best results, but there is nothing necessarily new about either of these rollers.

Below the rollers D′ D² are two rollers E′ E², which are journaled in bearings provided on cross-pieces of the frame A and receive the folded web between them. The web is

cut between these rollers. The roller E′ is considerably larger than the roller E^2 and may be termed a "bed-roller," as it supports the web while being cut. The roller E^2 is provided with knives which cut the web transversely at the proper intervals to sever portions containing the matter constituting newspapers or like articles. These rollers may be of the usual or any suitable construction. Below the rollers E′ E^2 are arranged rollers F′ F^2, which receive the severed portions of the web one after another and move them inward. These rollers may be journaled in bearings mounted upon the frame A.

G′ designates a roller, and G^2 a revolving arm, whereby an adhesive substance, such as paste, may at intervals be applied to one side of the web which forms the newspapers or like articles. Ordinarily the adhesive substance is to be applied to that portion which is to form the front page. This roller G′ and the arm G^2 may be supported by the main frame of the press and journaled in any suitable bearings connected directly or indirectly with such frame. The roller G′ is opposite that surface of the web which is turned inside in the folding operation, and its sole purpose is to support the web during the pasting. The arm G^2 is arranged opposite the roller G′, but outside of the web. Adjacent to it is a roller G^3, which rotates within a paste-box G^4, the latter having an opening in one side in which the roller works. The paste-box above its bottom G^5 has a scraper which protrudes through the side opening in which the roller G^3 works and serves to remove from the roller superfluous paste. The construction of the paste-box in relation to the roller G^3 may be best understood by reference to Fig. 4. The plane on which this sectional view is taken does not intersect the paste-box itself, but is beyond one end of the paste-box and intersects extensions of the sides and top which serve to support the paste-box. The bottom of the paste-box is indicated by cross-hatching it with dotted lines. The scraper is also indicated by dotted lines. It will preferably consist of a steel plate clamped on an elevated side portion g of the bottom of the paste-box and by means of a plate g', which is arranged above said elevated side portion of the bottom. This clamping-plate may be fastened by screws or otherwise to the elevated side portions of the bottom. Owing to the fastening of the plate to an elevated side portion of the bottom of the paste-box it does not bear throughout its surface upon the main portion of the bottom of the paste-box, and hence may be raised or lowered by bending it up or down. The free end of the scraper, or, in other words, that end which is adjacent to the roller G^3, has depending from it a number of pins g^2, having inclined lower ends. Opposite these pins are a number of screws g^3, which have conical ends and occupy horizontal positions. These screws are supported by bearings g^4 and engage with nuts g^5. By adjusting the screws in one direction their conical ends acting against the inclined ends of the pins g^2 will raise the free end of the scraper and thereby cause it to remove more of the paste from the roller G^3. When the screws are adjusted in the reverse direction, the resilience of the scraper will cause it to move downwardly into a position wherein it will remove less paste from the roller G^3. Of course the downward movement of the scraper will be aided by the weight of paste upon it. The screws are shown as having handpieces at their outer ends beyond the paste-box to facilitate their adjustment.

The arm G^2 will periodically contact with the surface of the roller G^3 and receive paste therefrom. It will carry this paste to the outside of the web. The extent of the surface of the web receiving paste from this arm will of course be dependent upon the area of the outer extremity of the arm. As shown, the pasting portion is of sufficient size to apply paste over a large part of the portion of the main sheet to be covered by the small sheet, so that the latter is attached bodily to the main sheet and forms a permanent part thereof. It will be understood, however, that the mechanism shown may be used to attach sheets otherwise than bodily, and it is desirable, therefore, that means should be provided by which the amount of paste applied may be varied as desired. With the construction shown, moreover, in which I have provided means for varying the size of the small sheet containing the supplementary matter, it is necessary for the attachment of all such sheets bodily to the paper in such a manner as to form a permanent part thereof that the extent of surface to which paste is to be applied should be increased with the size of the small sheets. To afford provision for varying the surface to which paste will be applied, I preferably make the outer extremity of the arm G^2 removable. To provide for the removal of the outer end of the arm, I have shown the arm as bifurcated longitudinally and as having a dovetailed slideway at the outer extremity. Its bifurcate portions may be forced nearer together by means of a screw g^6 passing through one and engaging with a tapped hole in the other. A block of wood or like material g^7 is fitted into the dovetailed slideway of the arm and clamped therein. The outer surface of this block is arc-shaped and is preferably faced with a sheet of felt or like material g^8. By loosening the screw g^6 the force with which the bifurcate parts of the arm grip the block g^7 will be relaxed, and then the block may be removed and replaced by another having a greater or smaller area of surface.

The rollers C′ C^2 may be mere idlers deriving motion from the web in its passage. The rollers D′ D^2 E′ E^2 F′ F^2 and the roller G′ and revolving arm G^2 are, however, rotated by any suitable means, as, for instance, through gear-wheels mounted upon their

journals or shafts. It will be understood, however, that the roll C^2 will preferably be cut away opposite the paster G^2 to avoid offsetting, as shown in Fig. 3, although this may not be found necessary.

W^2 is the web of supplementary matter which is to be cut into pieces and the pieces attached to the portions of the web W′, forming newspapers. It passes from a supply-roller H down and around a guide-roller H′, and thence between two rollers H^2 H^3, whereby it is drawn forward. The rollers H H′ may be journaled in bearings affixed to the main frame A. The rollers H^2 H^3 are, however, journaled in a frame A′, which is fitted in oblique slideways H^4, so that it may slide obliquely downward toward the rollers E′ E^2 or in the reverse direction. The bearings for the roller H^2 are made adjustable in housings in the frame A′, so as to provide for varying the pressure with which the roller H^2 will coact with the roller H^3. Screws *h*, combined with nuts *h*′ and springs h^2, serve to vary this pressure. These rollers are shown as geared together by means of gear-wheels h^3 h^4, affixed to their journals or shafts. The gear-wheel h^4 engages with a gear-wheel h^5, mounted upon a stud which is affixed to the sliding frame A′. The gear-wheel h^5 meshes with a gear-wheel h^6, which is affixed to a shaft carrying a roller H^5 and mounted in the adjustable frame A′. Opposite this roller H^5 a roller H^6 is journaled in the adjustable frame. The bearings for the roller H^6 are fitted to housings with which said frame is provided, and are combined with screws h^7, whereby the position of the roller H^6 relative to the roller H^5 may be varied. On the shaft of the roller H^6 a gear-wheel h^8 is affixed, and this engages with the gear-wheel h^6.

The web W^2, after passing between the rollers H^2 H^3, passes between the rollers H^5 H^6. The roller H^6 is a cutter and therefore is provided with a knife or knives h^9. As here shown, it has two knives arranged diametrically opposite to each other. In the periphery of the roller H^5 are fitted blocks h^{10}, of wood or other suitable material. These are arranged at distances apart corresponding to the distances between the knives h^9 upon the surface of the roller H^6. As the roller H^5 is very much larger than the roller H^6, there are in the present instance six of these blocks h^{10}. They may be fastened in place in any suitable manner. As here shown, they are inserted endwise in dovetailed grooves which extend parallel with the axis of the roller, and are retained against endwise movement by means of screws h^{11}, which pass through them and engage with lugs h^{12}, with which the ends of the roller are provided.

In passing between the rollers H^5 H^6 the web W^2 is severed into small pieces, which will each be of the size necessary for the supplementary matter. Opposite the meeting surfaces of the rollers H^5 H^6 a table I is arranged. This table consists, essentially, of two plates i' i^2, of steel or other suitable material supported by bars I′, extending parallel, with the rollers H^5 H^6 and fastened to the main frame A. The two plates i' i^2 of the table I are at their upper ends serrated or provided with a number of fingers. The fingers of each plate fit into the spaces between those of the other plate, as may be readily understood by a glance at Fig. 5. These plates are fastened to the bars I′ by means of screws passing through slots formed longitudinally in said plates and engaging with tapped holes formed in the bars. Owing to this construction of the table provision is afforded for elongating it or contracting it without forming a space between its two parts.

The pieces of the web W^2 cut off by the rollers H^5 H^6 pass over the table I, and before being severed from the main portion of said web become engaged with two rollers J′ J^2, which are journaled in bearings supported by the main frame A. The lower roller J^2 will preferably be made of wood. It is arranged beneath the table I and between the bars I′. It has circumferential ribs which project upwardly through spaces provided for them between the fingers of the two plates i' i^2 forming said table. The upper roller J′ is smooth and coacts with the ribs of the lower roller J^2. The bearings of the roller J^2 are adjustable by means of screws *j* for the purpose of elevating and lowering such roller. This roller is a mere idler, deriving motion from the passage of the pieces of web W^2 over it. The roller J′ is, however, positively driven through a gear-wheel *j*′, affixed to one of its journals and engaging with a gear-wheel j^2, which is mounted upon a stud affixed to the main frame A. Motion is imparted to the gear-wheel j^2 by a gear-wheel *k*, which is affixed to one of the journals of a roller K, arranged above the roller D^2. The gear-wheel *k* derives motion from a gear-wheel on a shaft of the roller D^2. This roller K is journaled in bearings fitted to housings in the main frame A, so as to be adjustable, through the agency of screws *k*′.

L′ designates a guard consisting of a plate fastened to the adjustable frame A′ and extending up at an incline to a point opposite the meeting surfaces of the rollers H^5 H^6. Its function is to prevent the web W^2 from running down over the roller H^5 and to insure its passage onto the table I.

Between the rollers H^5 H^6 and the rollers J′ J^2 a guard L^2 is arranged. It consists of a plate extending upward from the plane of the table I and thence over the table. Its portion which extends over the table is inclined downwardly as it extends from the roller H^6 to the roller J′. The function of this guide is to prevent the web from rising off the table sufficiently to curl up during its movement from the rollers H^5 H^6 to the rollers J′ J^2. Of course after the severance of a piece from the web W^2 the rollers J′ J^2, which move it

onward, can exert no pulling force upon the main portion of the web. Consequently the main web is to be pushed forward over the portion of the table I until it reaches the rollers J′ J². Almost immediately on the forward edge being gripped by these rollers J′ J² the forward portion is severed by one of the rollers H⁵ H⁶ from the main portion of the web.

Between the roller J′ and the roller K a guard L³ is arranged above the table I. This is constructed like the guard L², and that portion which extends over the table is inclined downwardly from the roller J′ toward the roller K.

The pieces cut from the web W² are severally moved onward by the rollers K and D², and on leaving these rollers pass along a guide M, which closely fills the space between those portions of these rollers which are opposite the cow-catcher B, but is so arranged as to leave a space between its under side and the roller D² for the passage of the pieces cut from the web W². Of course only one of these pieces passes along at a time. The others follow it in succession.

Each piece cut from the web W² is carried by the roller D² into contact with the web W′. The speed of the mechanism whereby motion is imparted to the pieces cut from the web W² will bear such relation to the speed at which the web W′ is moved that one of the pieces of supplementary matter cut from the web W² will be presented opposite the surfaces of the web W′, to which paste has been applied by the arm G². Consequently the pieces of supplementary matter cut from the web W² will all be fastened to the same portion of each newspaper or like article which is severed from the web W′.

It will be understood that the pieces of supplementary matter may vary in size. As they vary in length, it will be necessary to vary the speed at which they are fed relatively to the speed of the movement which the web W′ receives, and it will also be necessary to vary the time of cutting. A variation of the time of cutting may be produced by taking out a knife or knives from the roller H⁶. As this roller is represented as provided with but two knives, its time of cutting would be varied by removing one of them. The speed may be varied by altering the mechanisms whereby motion is imparted to the gear-wheel h^6 on the roller H⁵, for, as the motion of the roller H⁶ and the motion of the rollers H² H³ are all derived from this gear-wheel h^6, the speed of all the parts which feed the web W² up to the time of cutting it into pieces will be varied. Obviously it is not necessary to vary the speed of the roller D², because the cut pieces of the web W² must move at the same speed as the web W′ at the time of meeting and being secured to this web.

I will now describe the mechanism through which motion is imparted to the gear-wheel h^6 and explain the manner in which the speed transmitted by it to said gear-wheel h^6 may be varied.

N designates a gear-wheel which is mounted upon a stud n, that is fastened in a slotted bracket n'. The slot in this bracket extends obliquely, and hence an upward movement of the gear-wheel N will result in shifting it farther away from the shaft or journal of the roller E². On this shaft or journal is a gear-wheel N′, through which motion is transmitted to the gear-wheel N. As the wheel N is shifted toward and from the axial line of the roller E², by adjusting it downward and upward within the oblique slot of the bracket n', it is obvious that the adjustment of the wheel N affords provision for removing any particular gear-wheel N′ and substituting therefor another of a different size. The substitution of a gear-wheel N′ of a different size for another will of course effect a variation in the speed transmitted to the gear-wheel N.

Whenever the gear-wheel N is adjusted in the bracket N′ it will necessitate an adjustment of the sliding frame A′ in the main frame A, for if the gear-wheel h^6 of the roller H⁵ were not moved to one side it would be impossible to adjust the gear-wheel N. When the sliding frame A′ is thus adjusted, the rear part of the table I′ will also be adjusted in the same direction, so as to preserve its position relatively to the rolls H⁵ H⁶, in order that the proper feeding of the sheets may be secured, the table being made adjustable for this purpose, as above described.

It will be seen that when the illustration-sheet or other small sheet containing supplementary matter is attached in the manner described, so as to form a permanent part of the main web and a part of the reading matter of the page to which it is attached, the part of the page of the main sheet beneath it becomes waste space, which may either be left unprinted in printing the main sheet, or if it is preferred that the type-form should be full may be printed with waste matter.

I am aware of the patent to Luther C. Crowell for improvements in web-printing machines, No. 452,596, dated May 19, 1891, and I do not claim any subject-matter shown or described therein.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding and pasting mechanisms constructed and located in position to advance printed sheets of less length than the main sheets and of small size relatively thereto and attach them to the pages of the main sheets over a waste space on the latter, so as to form a part of the printed matter on the pages to which they are respectively attached, substantially as described.

2. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding, severing, and pasting mech-

anisms constructed and located in position to sever from a narrow printed web sheets of less length than the main sheets and of small size relatively thereto and attach them to the pages of the main sheets over a waste space on the latter, so as to form a part of the printed matter on the pages to which they are respectively attached, substantially as described.

3. In a printing-machine, the combination with the delivery mechanism for the main sheets, of pasting mechanism for applying paste to a waste space on a main sheet, and feeding mechanism constructed to advance printed sheets of less length than the main sheets and of small size relatively thereto and located in position to deliver said small sheets upon the pasted waste spaces on the main sheets, whereby the main sheets are provided with small sheets forming a part of the printed matter on the pages to which they are respectively attached, substantially as described.

4. In a web-printing machine, the combination with the longitudinal folder whereby the main sheets are doubled, of feeding and pasting mechanisms constructed and located in position to advance printed sheets of less length than the main sheets and of small size relatively thereto and attach them to the outer pages of the main sheets after the latter leave the longitudinal folder and over a waste space on the main sheets, so as to form a part of the printed matter on the page to which they are respectively attached, substantially as described.

5. In a web-printing machine, the combination with the longitudinal folder, whereby the main sheets are doubled, of pasting mechanism constructed and located in position to apply paste to said main sheets as they pass over the folder, and feeding mechanism constructed to advance printed sheets of less length than the main sheets and of small size relatively thereto, and located in position to deliver said small sheets on the pasted portions of the main sheets, substantially as described.

6. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding and pasting mechanisms constructed and located in position to advance printed sheets of less length than the main sheets and of small size relatively thereto and attach them to the pages of the main sheets over a waste space on the latter, so as to form a part of the printed matter on the pages to which they are respectively attached, and means for varying the speed of said feeding mechanism in accordance with the size of the sheets to be attached, substantially as described.

7. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding and pasting mechanisms constructed and located in position to advance small printed sheets and attach them to the main sheets, and means for varying the speed of the feeding mechanism in accordance with the size of the small sheets relatively to the main sheets, substantially as described.

8. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding and pasting mechanisms constructed and located in position to advance small printed sheets and attach them to the main sheets, and means for adjusting the pasting mechanism to vary the extent of surface to which paste is applied, substantially as described.

9. In a printing-machine, the combination with the delivery mechanism for the main sheets, of feeding and pasting mechanisms constructed and located in position to advance small printed sheets and attach them to the main sheets, and means for varying the speed of the feeding mechanism and the extent of surface pasted in accordance with the size of the small sheets, substantially as described.

10. In a printing-machine, the combination with the delivery mechanism for the main sheets, of web feeding, severing and pasting mechanisms constructed and located in position to sever from a narrow printed web small sheets and attach them to the main sheets, means for varying the length of the small sheets severed by the severing mechanism, and means for varying the speed of the feeding mechanism in accordance with the size of the small sheets, substantially as described.

11. In a web-printing machine, the combination with the folder for doubling the main web and feeders for moving forward the web after folding, of feeders for propelling another web toward the web first mentioned, a cutter having removable knives and operating to sever portions of the second web and variable mechanism for driving the feeders and cutters for the second web, substantially as described.

12. In a web-printing machine, the combination with the delivery mechanism, of rollers H^2, H^3 for feeding a second web, cutting-rollers H^5 H^6 for severing such web, a table adjacent to the rollers H^5 H^6 and a feeding-roller for conducting portions of the second web into contact with the main web, substantially as described.

13. In a web-printing machine, the combination with the delivery mechanism, of rollers H^2, H^3 for feeding a second web, cutting-rollers H^5, H^6 for severing such web, a table adjacent to the rollers H^5, H^6, a feeding-roller for conducting portions of the second web into contact with the main web and guards for preventing the curling of the edges of the second web, substantially as described.

14. In a web-printing machine, the combination with the delivery mechanism, of rollers H^2, H^3 for feeding a second web, cutting-rollers H^5, H^6 for severing such web, a table adjacent to the rollers H^5, H^6 and having openings through it, two rollers on opposite sides of said

table operating to feed the pieces cut from the second web over the said table and a feed-roller for conducting the pieces cut from the second web into contact with the main web, substantially as described.

15. In a web-printing machine, the combination with the delivery mechanism, of rollers H^2, H^3 for feeding a second web, cutting-rollers H^5, H^6 for severing such web, a table adjacent to the rollers H^5, H^6 constructed of two sections having intermatching finger-like portions at their opposite ends and having openings through it, two rollers on opposite sides of said table operating to feed the pieces cut from the second web over the said table, and a feed-roller for conducting the pieces cut from the second web into contact with the main web, substantially as described.

16. The combination with two sheet-feeding mechanisms adjustable relatively to each other, of a table supporting the sheet between the feeding mechanisms, and means for adjusting the length of said table, substantially as described.

17. The combination with rolls J' J^2 engaging by ribs, of table I having fingers extending between said ribs and made in two parts for adjustment of the length of the table transversely to the rolls, substantially as described.

18. The combination with driving-shaft N', of driven shaft *n* mounted in inclined bearings, and sliding frame A' carrying rolls driven from shaft *n*, substantially as described.

19. The combination with a forked paste-block carrier, of means for adjusting said forks to hold paste-blocks of different sizes, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. TURNER.

Witnesses:

EDWD. H. ARGENT,

C. M. HAMMOND.