

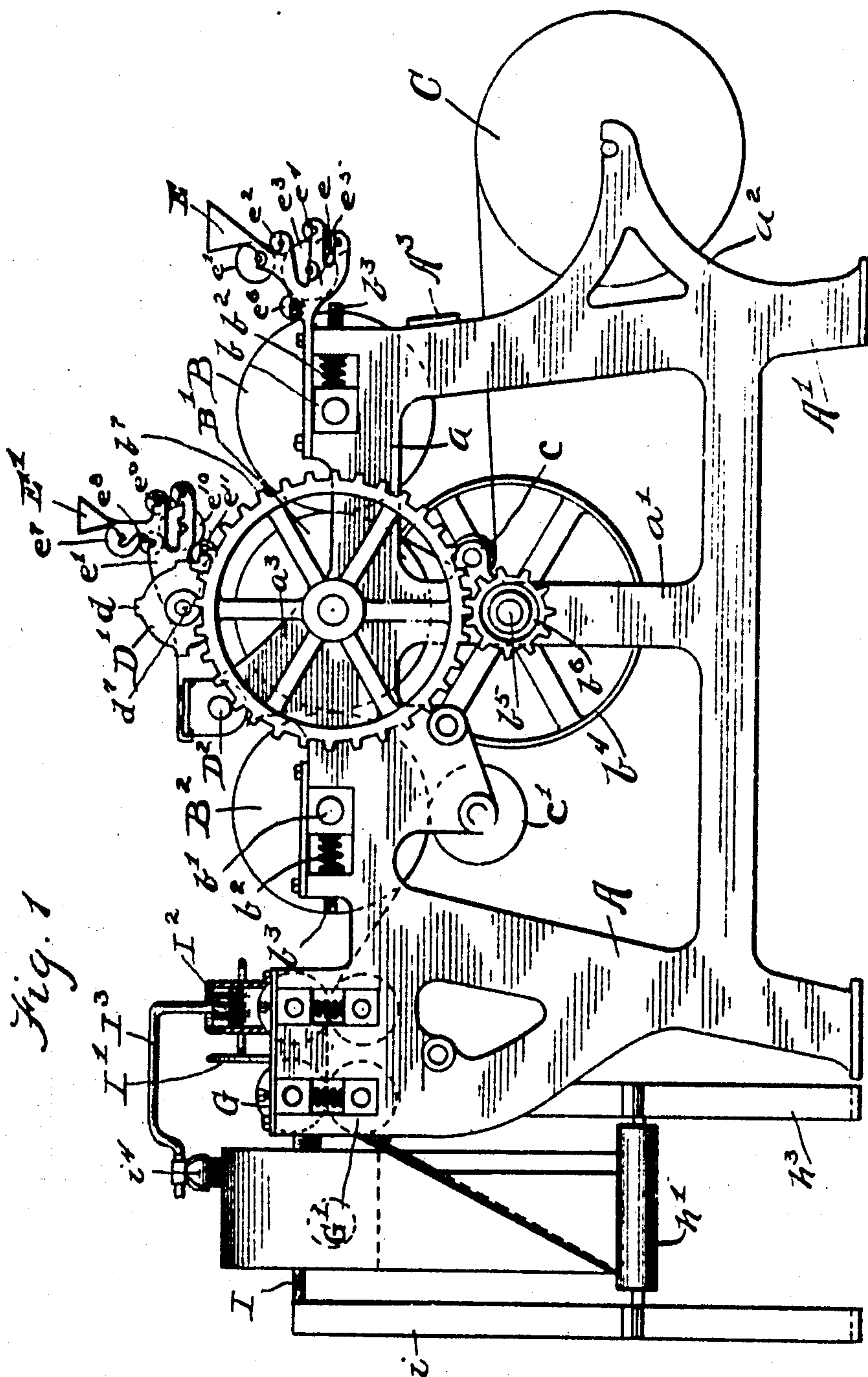
No. 875,638.

PATENTED DEC. 31, 1907.

G. A. WALSTEAD & S. MOE.
MACHINE FOR PRINTING LEAVES FOR BOOKS.

APPLICATION FILED JAN. 3, 1905.

4 SHEETS—SHEET 1.



Witnesses
J. W. Angell
and W. H. Witherby

Inventors
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by Charles H. Rice Atty.

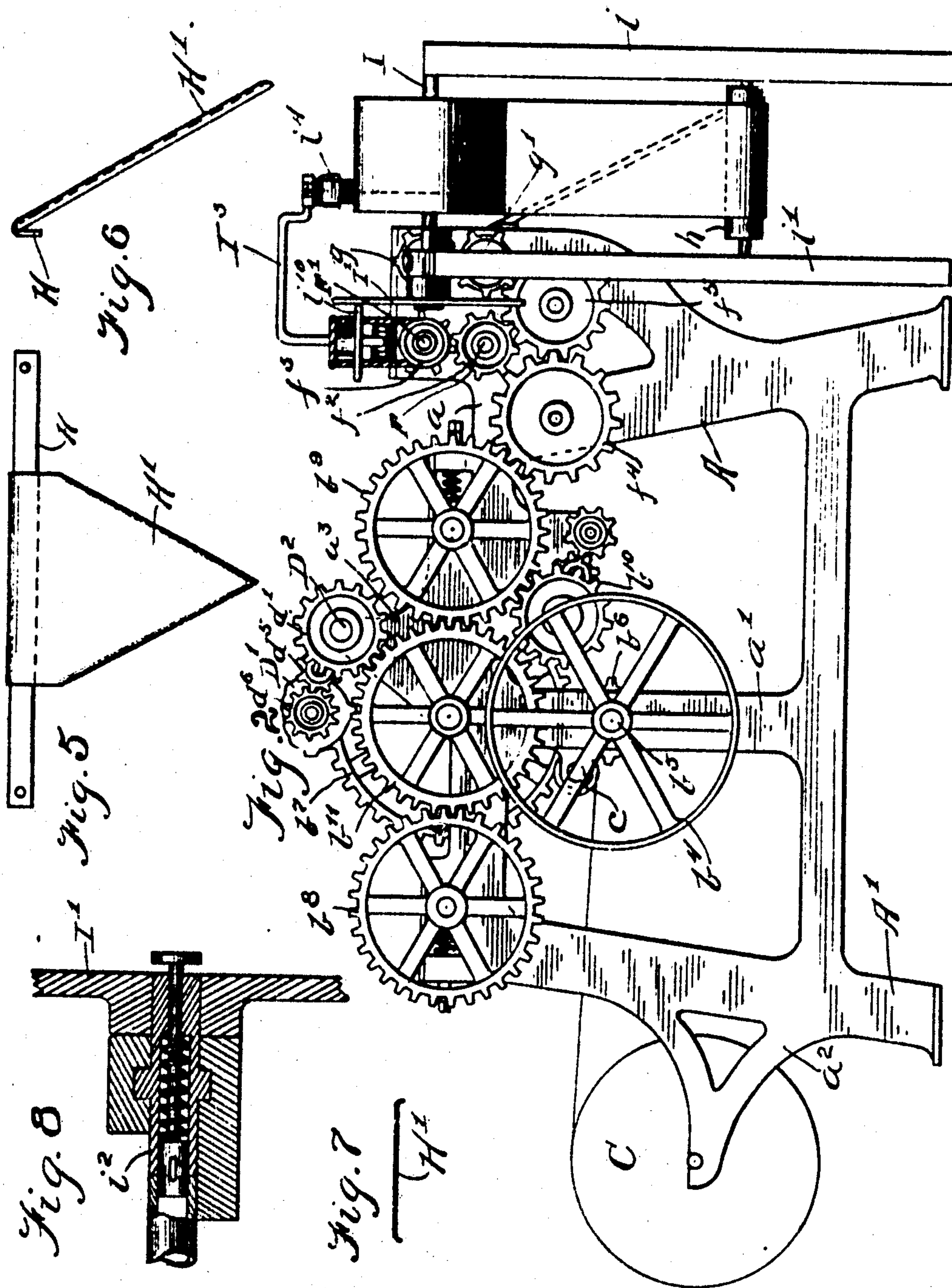
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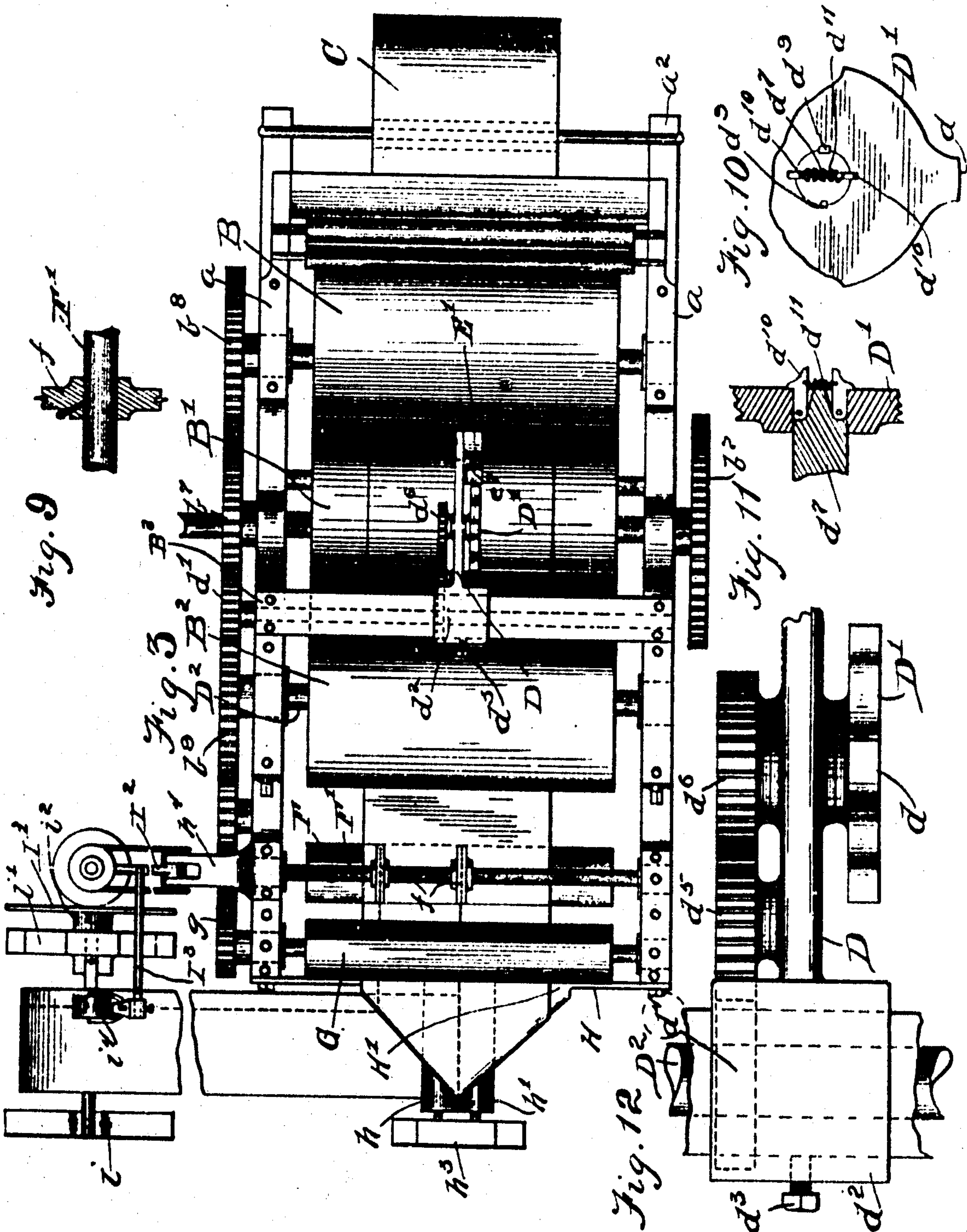
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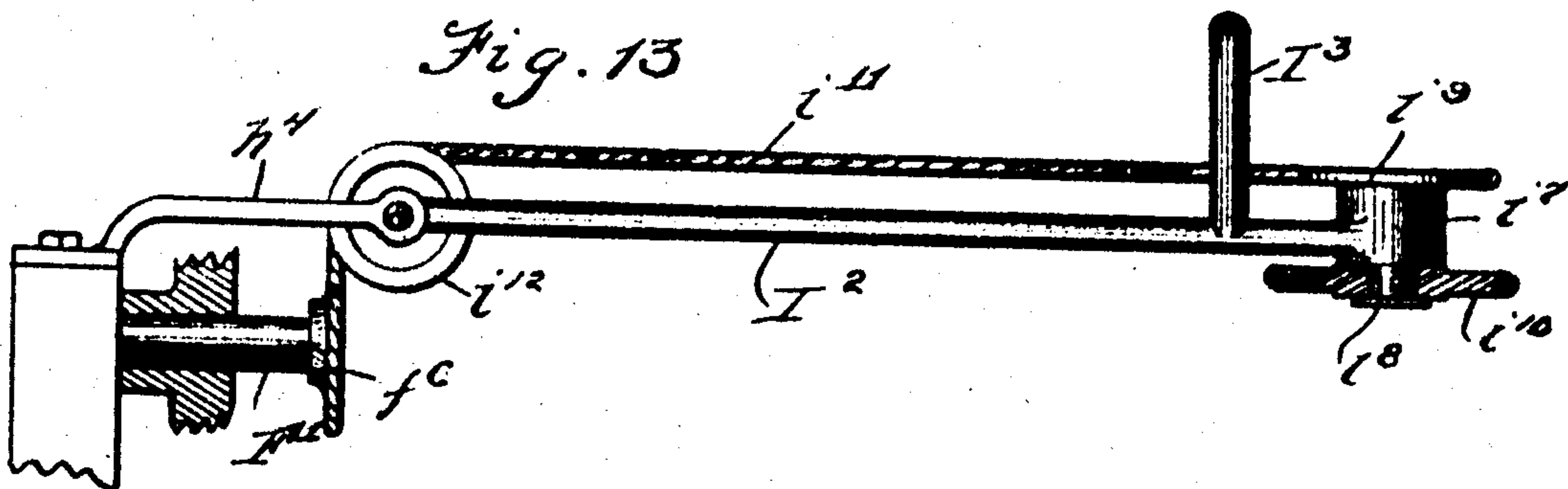
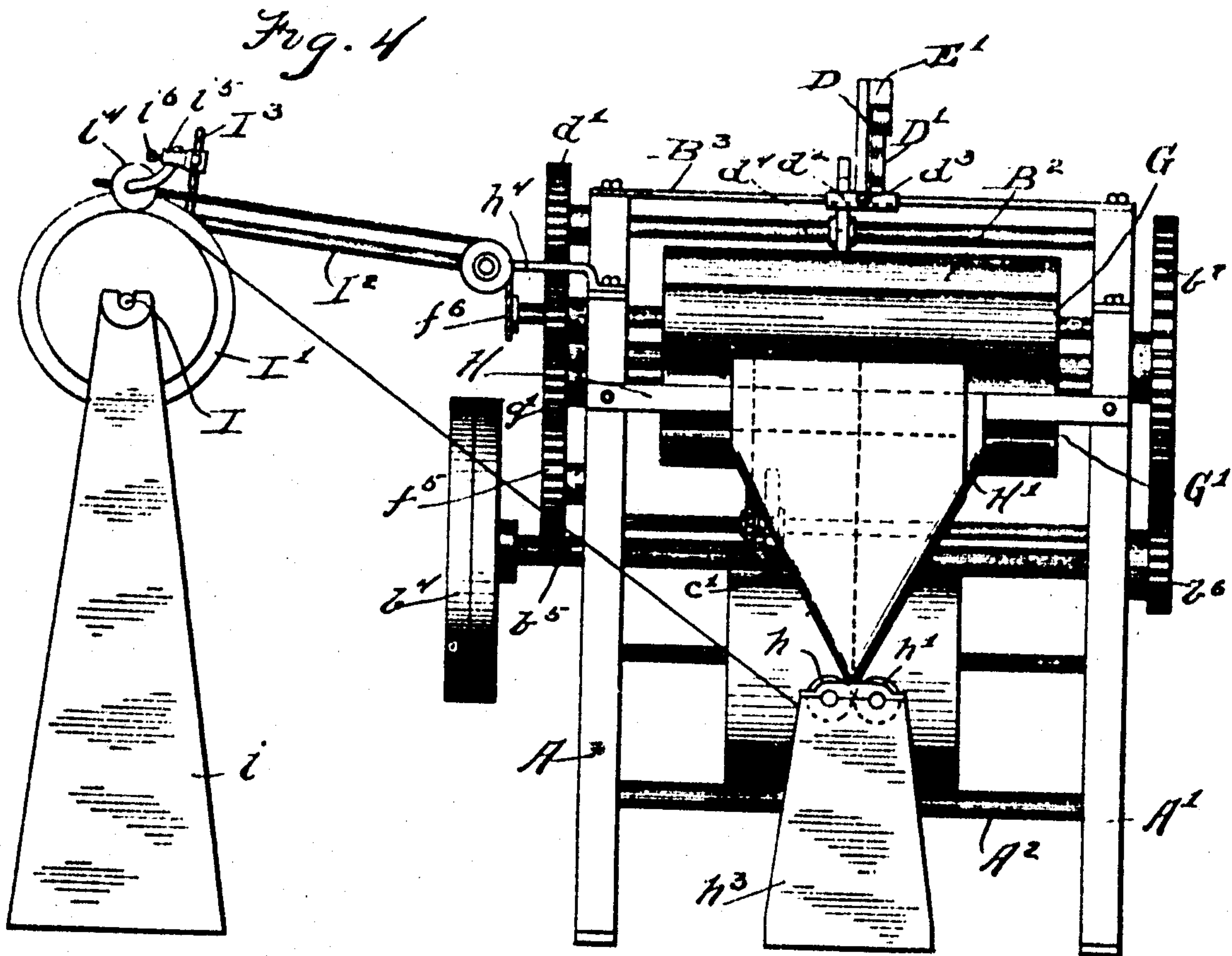
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by *Charles H. Rice, Atty.*

UNITED STATES PATENT OFFICE.

GUSTAV A. WALSTEAD AND SIVERT MOE, OF CHICAGO, ILLINOIS.

MACHINE FOR PRINTING LEAVES FOR BOOKS.

No. 875,638.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed January 3, 1905. Serial No. 239,363.

To all whom it may concern:

Be it known that we, GUSTAV A. WALSTEAD and SIVERT MOE, citizens of the United States, and residents of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Machines for Printing Leaves for Books; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and to the letters of reference marked thereon which form a part of this specification.

This invention relates to machines for printing leaves for books, and more particularly to a machine adapted to print the leaves of such books as sales memoranda books and the like from which the salesman delivers to the purchaser a check, a duplicate of which is forwarded to the accounting office.

Heretofore books of the class described have usually been constructed by first printing, and cutting the leaves to the desired size on one machine, then usually folding the sheets to afford the stubs, after which the leaves are sorted and bound.

The object of this invention is to provide a printed roll of paper of the class described and also a machine adapted to print from a roll of paper a plurality of duplicate pages with the lines running longitudinally of the strip, perforate the same to afford the check and stub, then folding the sheet longitudinally to bring the duplicate checks together and again rolling the printed and longitudinally folded strip into a compact roll for further use.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a side elevation of a device embodying my invention. Fig. 2 is a similar view taken on the driving side thereof. Fig. 3 is a top plan view of the same, partly broken. Fig. 4 is a front end elevation of the same. Fig. 5 is a front face view of the folder. Fig. 6 is a side elevation of the same. Fig. 7 is a transverse section. Fig. 8 is an enlarged detail of one form of coupling between the roll shaft for the paper with the driving mechanism therefor. Fig. 9 is an enlarged sectional detail of one of the perforating rolls. Fig. 10 is an enlarged fragmentary detail of the adjustable numbering wheel and the means for securing the same in place. Fig. 11 is a section taken longitudinally of the shaft of the numbering

wheel. Fig. 12 is an enlarged fragmentary top plan view of the drive for the numbering wheel. Fig. 13 is an enlarged detail in side elevation of the mechanism for adjusting the drive of the receiving roll to the speed of the machine.

As shown in said drawings: A printing press is used having a frame comprising side frame members affording supporting legs A, A', the top frame members *a* of the machine and the central bearing standard *a'* and rigidly secured together by means of transverse members A², A³ in the usual or any desired manner. Journaled on said frame are rolls B and B' and B² which are in approximately the same plane and in peripheral contact as shown in Figs. 1 and 3 and of which the roll B is the main printing roll and which bears against the roll B' on the opposite side from the roll B². Said rolls B—B² are each slidably engaged in the top in the frame by means of sliding bearings *b*—*b'* against which presses a spring *b²*, the tension of which can be varied by means of a screw shaft *b³*, thereby holding said rolls in positive but yielding engagement with the central roll B'. Carried upon a bracket *a²*, integral with each of said legs A' is the paper roll C adapted to support a roll of paper of any desired size, of which the end of the strip leads forwardly around a small roll *c* beneath the roll B' and upwardly between the rolls B and B' then downwardly between the rolls B' and B² and is engaged against the roll B² by a lower roll *c'* which may also be a printing roll should it be desired to print both sides the strip then forwardly through the perforating and folding mechanism. Said rolls are driven at a uniform peripheral rate of speed by means of the driving pulley *b⁴* on the shaft *b⁵* on which on the other side the frame is secured a pinion *b⁶* which intermeshes with the gear *b⁷* which drives the roll B'. A gear *b¹¹* engaged on the shaft of the roll B' on the opposite side of the frame from the gear *b⁷* meshes with the gears *b⁸* and *b⁹*, the latter of which intermeshes with a gear *b¹¹* which drives the lower printing roll *c'*.

The inking mechanism may be of any desired kind and is omitted from the drawings inasmuch as any of the usual inking means will suffice. Inking means are provided at the rear of the printing roll B which as shown, comprises an ink receptacle E supported on brackets *e* rigidly secured to the frame and upon which any desired number of

distributing rollers $e^1-e^2-e^3-e^4-e^5-e^6$ are journaled which are in physical contact with each other and the first of which receives the ink from an aperture in the ink trough or receptacle E, and the last of which delivers and spreads the ink on the printing roll B.

Journalled upon brackets a^2 which project centrally above the side frame members is a transverse shaft D^2 on the outer end of which is a gear d^1 which meshes with the gear b^{11} . Above said shaft and rigidly secured upon said brackets is a transverse bar D^3 upon which is slidably engaged a bracket arm D the head d^2 of which is held in adjusted position on said bar by means of a set screw d^3 . Said bracket head also engages a gear wheel d^4 feathered on said shaft as shown in Fig. 4 and in dotted lines in Fig. 12 and which meshes with complemental gears d^5 and d^6 , journaled on said bracket arm. Said gear d^4 is rigidly secured on the same shaft d^7 with a numbering wheel D' which, as shown, is removably secured on the shaft d^7 by means of oppositely disposed keys d^9 and also by means of the detents d^{10} two of which are shown seated in slots in the end of the shaft and provided with an outwardly extended head adapted to extend through said wheel and provided with inwardly directed shoulders which bear against the face of the wheel. A spring d^{11} engages between said heads and holds the shoulders in engaging position. Said numbering wheel D' has arranged on its periphery at equal distances apart flat faces, each adapted to afford a flat type face d each marked with the same numeral or character for the purpose of paging each page of a roll with the impression of the same character or number, and which bear upon the sheet as the same passes over the roller B' as shown in Fig. 3. Carried on the outer end of said bracket D is an inking receptacle E' provided with an aperture therein adapted to deliver ink to distributing rollers $e^7-e^8-e^9-e^{10}$ and e^{11} which are journaled on stud shafts on said arm and are in physical contact and the last of which is in position to be engaged by the type faces on numbering wheel D' , thereby inking the same and being rotated thereby into position to afford a fresh inking face for the next type thereon as the numbering wheel revolves.

In advance of the roll B^2 are the perforating and folding mechanisms. Said perforating mechanism as shown, comprises a lower roll F over which the paper passes and an upper shaft F' upon which are secured the toothed wheels f , as shown in Figs. 3 and 9 and which are each adjustably engaged upon said shaft by means of set screws. Said perforating wheels are so positioned with relation to the roll F as to press the paper down thereon perforating the same in longitudinal lines at the proper distances from the edges to afford a tearing line between the stub and

body of the page and between the page body and duplicate check. Said roll F and shaft F' are driven from intermeshing gears f^2 and f^3 , driven from the train of gears f^1 and f^2 , the former of which intermeshes with the gear b^9 as shown in Fig. 2.

In advance of the perforating means are guide rolls G and G' , between which the paper passes to the folding mechanism and which are also driven at equal peripheral speed by intermeshing gears g and g' , the latter of which meshes with the gear f^3 . Secured at the front of the frame by means of a transverse bar H is the folding guide H' which depends from said bar and is provided with underturned edges terminating at a point at the lower end of the guide as shown in Fig. 4 and which is directed centrally between the guide rollers h , h' which are journaled at a right angle with the rolls before described and upon a suitable base h^3 in front of the machine. The paper is drawn downwardly in a double fold between said rolls and carried at a right angle from the press to the receiving mandrel I at a uniform rate of speed. Said receiving mandrel is removably journaled in suitable bearings at the upper ends of an upright frame, comprising the side members $i-i'$ upon the latter of which in axial alinement with the bearings of the mandrel, is journaled a frictional disk I' , the shaft i^2 of which extends through into the bearing and is shaped to afford a clutch with the complementally formed adjacent end of the shaft or mandrel I.

Journalled upon a bracket arm h^4 rigidly secured on the frame above the shaft F' is the pivoted arm I^2 near the outer end of which is a laterally and downwardly directed arm I^3 at the extremity of which is adjustably journaled a roller i^4 which tracks upon the mandrel or the paper wound thereon as shown in Figs. 2, 3 and 4 and is secured to said arm by means of a slotted head i^5 carried on the arm, through which extends a stem i^6 of the caster or roller to admit of adjusting the relation of the two parts. At the outer end of the arm I^2 is provided a bearing i^7 in which is journaled a shaft i^8 on one end of which is secured a grooved pulley i^9 and on the other end of which is rigidly secured a friction disk i^{10} . This disk, as shown, is provided with a band of rubber or other suitable material in its periphery which bears against the face of the friction disk I' . As shown, a grooved pulley f^9 is provided on the extremity of the shaft F' which projects beneath the pivot for said arm I^2 and a cable, belt, chain or other flexible connection i^{11} is trained about the same and about the grooved pulleys i^{12} and i^9 on said arm I^2 , whereby the friction disk i^{10} is rotated.

The operation is as follows: The paper secured upon a roll C at the rear end of the machine is fed therethrough by the draft of the

printing rolls thereon and is printed transversely of the sheet to afford as shown, in Figs. 3 and 4, a plurality of transverse narrow printed pages comprising stubs, check and a duplicate check each of which is numbered or paged by the numbering wheel characteristic for that strip as the sheet passes beneath the same. The perforating wheels are adjusted to provide perforations longitudinally of the strips fed through the press but transversely of the printed pages thereon and are adjusted a distance apart to afford a tearing line to enable the duplicate to be torn from the check and the check to be torn from the stub when the transaction is consummated for which the check is used. Beyond the perforating wheels the guide rolls G and G' direct the paper over the folding guide H' from whence the paper is drawn downwardly between the guide rolls h and h' which press the two folded sides together and the end thereof is carried laterally and engaged in any suitable manner upon the removable mandrel I, which can be lifted from the bearings carried on the uprights i and i'. Said mandrel being engaged by the shaft of the friction disk I' and driven thereby rolls the printed, perforated and folded strips into a compact roll which, when is completed, may be removed for binding and cutting into books. Obviously, if the speed of the friction disk I where uniform, the paper would be wound on the mandrel much more rapidly when the roll approached completion and for the purpose of equalizing the peripheral speed of the roll, the pivoted bracket arms I² is provided upon which the friction disk i¹⁰ is gradually moved radially outward on the disk I' as the roll increases in size. This is accomplished by the increasing size of the roll lifting the roller i¹¹ which tracks upon the paper and upon which the outer end of the arm I² is supported. In consequence, as the roll increases in diameter a proportionate upward movement of the frictional contact between said disk is produced whereby the peripheral speed of the paper roll is maintained constant. After the sheet or strip has been fully printed, perforated, folded and rolled, the completed roll is lifted with its mandrel from the machine and a new mandrel substituted therefor and the operation proceeds as before.

The pages from the printed rolls are bound and cut by a machine forming the subject matter of another, book making machine, for which application for patent, executed by us is filed of even date herewith.

Obviously, many details of construction may be varied in the printing press proper and means for operating the same and obviously the strip may be printed upon one or both sides as preferred, and one or more numbering wheels employed supported either above or beneath the rolls dependent upon

which side the paper it is desired to imprint the numbers. Said numbering wheels may be differently constructed and operated than herein shown and described or constructed in any suitable manner to enable the successive pages or printed leaves for each strip to bear the same numeral. One roll thus is appropriated entirely to page 1 of a number of the book, another to page 2 and the third to page 3, in this manner, providing as many rolls as there are to be pages in the book to be constructed.

Obviously, mechanical details may be varied to produce a printed roll, such as herein described without departing from the principles of my invention.

I claim as my invention:

1. In a device of the class described the combination with printing and numbering mechanisms of means for making a plurality of lines of perforations longitudinally of the paper, mechanism for folding the paper longitudinally thereof, a mandrel adapted to receive said strip, a shaft rigidly engaged to the frame and projecting outwardly therefrom, means journaled on its outer end whereby said mandrel is rotated, an arm rigidly engaged to said shaft, a roller on the end of said shaft resting on said mandrel and adapted to regulate the velocity of the mandrel.

2. In a device of the class described the combination with a plurality of rolls adapted to feed a strip of paper therethrough, of means for perforating said strip longitudinally thereof, means for folding the strip longitudinally, a mandrel adapted to receive the folded strip thereon in a roll a friction wheel on the mandrel, a friction wheel pivoted on the side of the machine and adapted to contact therewith and means for automatically adjusting said wheels.

3. In a machine of the class described the combination with a plurality of rolls adapted to convey a strip therethrough, of printing means adjustably supported above the rolls, means adapted to perforate the strip longitudinally thereof, a downwardly tapering guide, a pair of coacting rolls beneath the same adapted to fold the strip longitudinally, a mandrel adapted to receive the folded strip and automatically operating means acting to vary the speed of the mandrel to give a uniform peripheral speed.

4. In a device of the class described the combination with a frame, of a plurality of rolls journaled thereon, means for driving said rolls, printing means supported adjacent said rolls, a downwardly tapering guide on the end of said frame, coacting rolls beneath said guide, a mandrel, a friction disk thereon, a friction disk pivotally supported on the frame and adapted to drive the friction disk on the mandrel and means for automatically moving the last named friction disk radially of the first named friction disk.

5. In a device of the class described the combination with means for printing and folding a strip longitudinally thereof, of a mandrel adapted to have said strip rolled thereon, a friction drive for said mandrel, means pivotally supporting said drive and means operated by the growth of the roll to adjust the speed of said mandrel.

6. In a device of the class described the combination with a frame of printing mechanisms thereon, folding mechanism on said frame adapted to fold a strip longitudinally, a mandrel on which the folded strip is wound, a driven friction disk thereon, a pivotally supported friction disk contacting with the driven friction disk, means for rotating said disks and means for automatically elevating said pivotally supported disk to vary the point of contact of said disks as the strip is wound.

7. In a device of the class described the combination with a frame of means adapted to print and perforate, a strip, means adapted to fold the strip longitudinally and pivotally supported variable speed controlling means acting to wind said strip into a roll.

8. A printing machine for printing a strip of paper from a roll to provide a plurality of duplicate narrow pages extending transversely of the strip, means impressing the same page character upon each page, a guide folding the strip longitudinally, a mandrel upon which said folded strip is rolled in a permanent roll, an arm pivoted on the machine, a friction disk thereon adapted to drive the mandrel and means on said arms acting to vary the speed of the mandrel.

9. A machine for the purpose specified, comprising printing, numbering and perforating mechanisms, means adapted to fold a

printed and perforated strip longitudinally, a mandrel upon which the printed strip is adapted to be wound, a disk rigidly engaged to said mandrel, a shaft pivotally engaged to said machine, a disk journaled on the end of said shaft adapted to frictionally engage the friction disk on the mandrel and an arm rigidly engaged to the shaft and provided with a roller on one end adapted to vary the speed of the mandrel.

10. In a machine of the class described the combination with printing means adapted to print a strip of paper to afford transversely extending closely arranged pages of means folding the same centrally and longitudinally, a mandrel upon which the paper is adapted to be rolled, means driving the same, a swinging arm supporting the driving means and means thereon acting to maintain uniform peripheral speed for said roll.

11. In a machine of the class described the combination with printing means adapted to print a strip of paper to afford transversely extending closely arranged pages of means folding the same centrally and longitudinally, a mandrel upon which the paper is adapted to be rolled, a friction disk driving said roll, an arm supported upon the roll of paper, a driving friction disk carried thereon and contacting with the first named friction disk.

In testimony whereof we have hereunto subscribed our names in the presence of two subscribing witnesses.

GUSTAV A. WALSTEAD.
SIVERT MOE.

Witnesses:

W. W. WITHEMBURY,
H. S. RUDD.