

No. 707,885.

Patented Aug. 26, 1902.

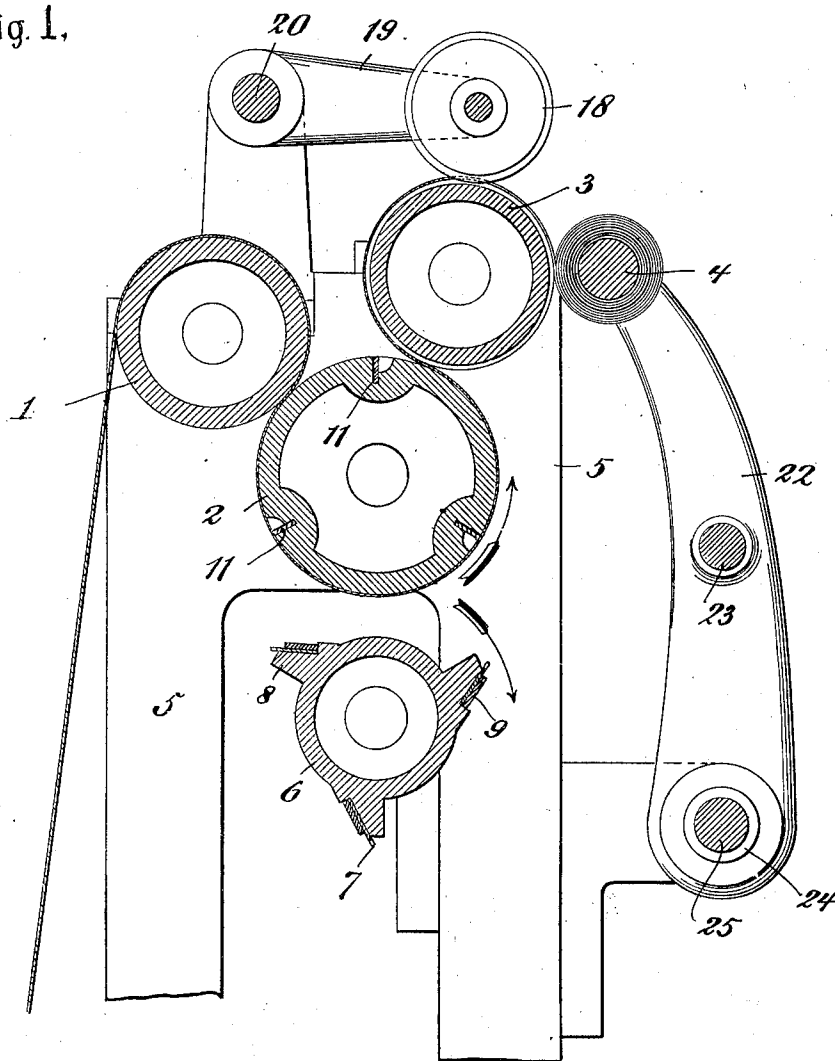
S. WHEELER.
MACHINE FOR PERFORATING PAPER.

(Application filed May 10, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



WITNESSES:

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INVENTOR

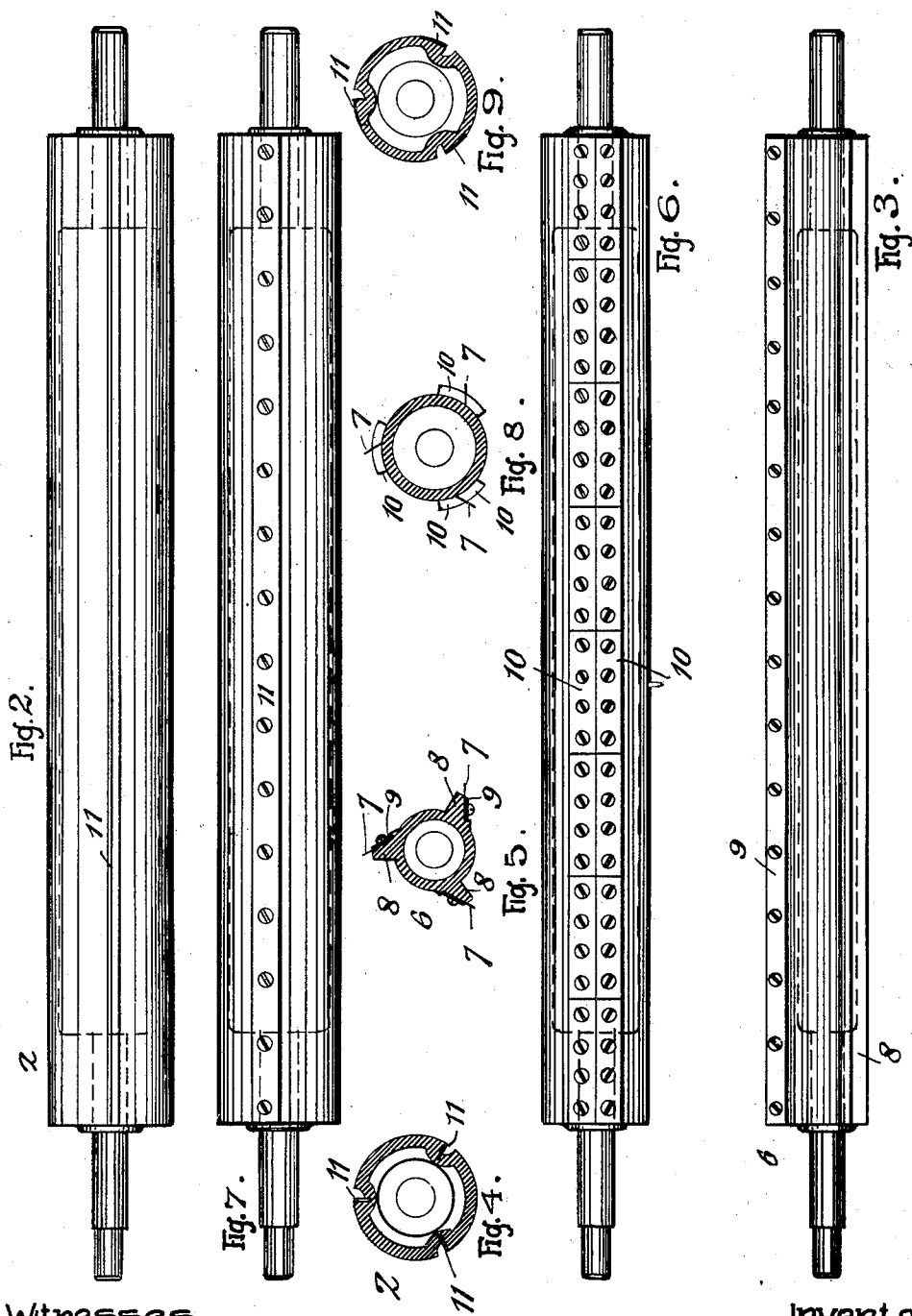
Samuel Wheeler

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(No Model.)

3 Sheets—Sheet 2.



Witnesses

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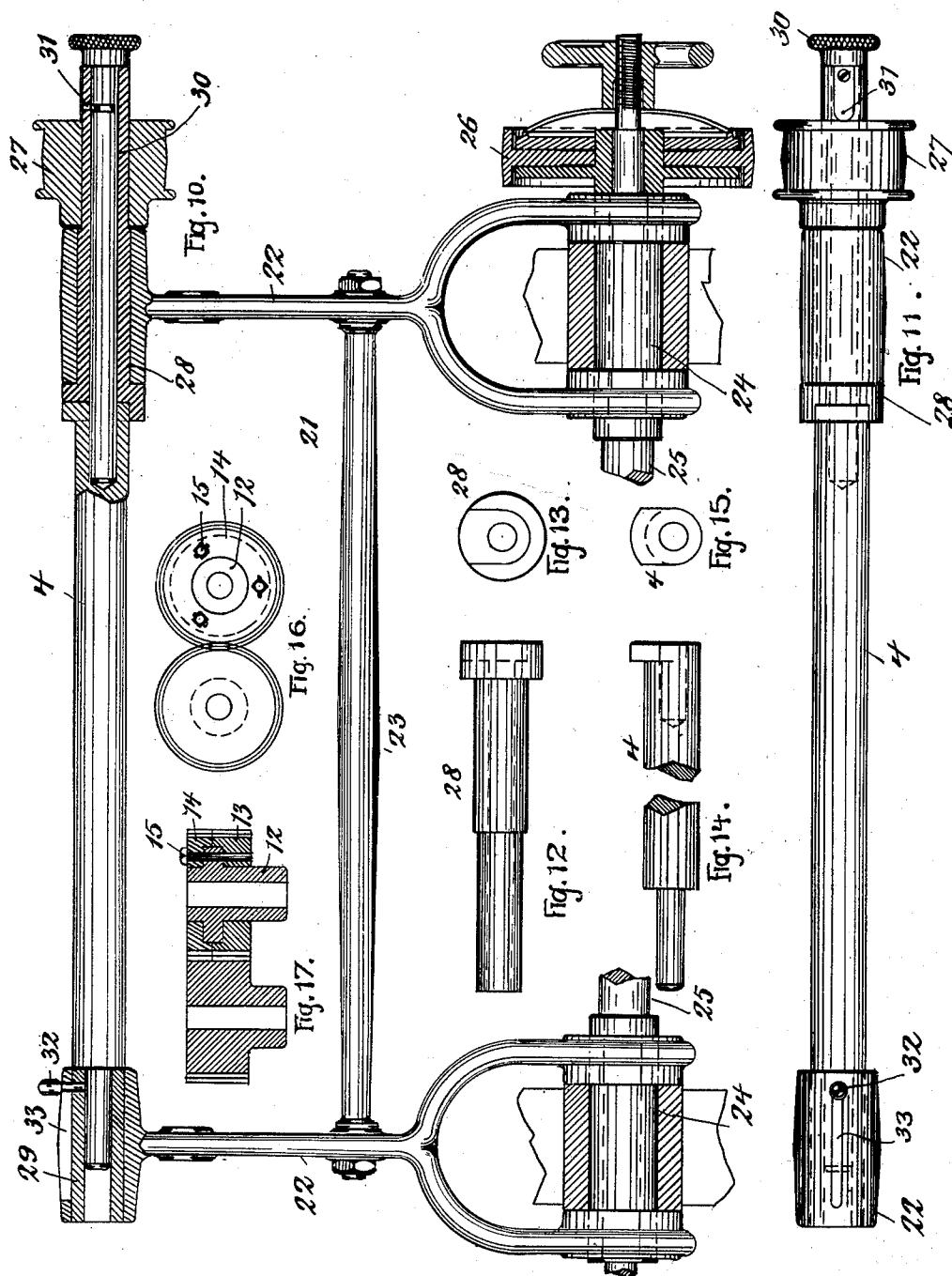
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(No Model.)

3 Sheets—Sheet 3.



Witnesses

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UNITED STATES PATENT OFFICE.

SETH WHEELER, OF ALBANY, NEW YORK.

MACHINE FOR PERFORATING PAPER.

SPECIFICATION forming part of Letters Patent No. 707,885, dated August 26, 1902.

Application filed May 10, 1901. Serial No. 59,580. (No model.)

To all whom it may concern:

Be it known that I, SETH WHEELER, a citizen of the United States of America, and a resident of Albany, in the county of Albany, State of New York, have invented certain new and useful Improvements in Machines for Perforating Paper, of which the following is a specification.

My invention relates to improvements in machines for perforating paper, and particularly to improvements in machinery for effecting the partial transverse separation and the longitudinal division of a web of paper and for the rewinding of same.

My invention consists in novel features in the construction of the die and cutter cylinders and in the rewinding mechanism whereby the division and partial separation of the paper is effected with certainty and uniformity and in means whereby the winding-shaft with its rolls may be quickly removed or replaced or another shaft substituted.

My invention also consists in a new and improved form of gear-wheel by which the rotary die and cutters may be adjusted relatively to each other and whereby wear may be taken up in the gearing.

The objects of my invention are to improve machinery of this kind in such a manner as to avoid the frequent stoppages which have hitherto occurred, due to the parting of the partially-separated sheets, and to simplify the removal and substitution of the winding-shaft.

My invention further consists in certain novel details of construction and combination of parts, as will be hereinafter more fully set forth, and other advantages will also appear hereinafter.

I will now proceed to describe a machine embodying my invention and will then point out the novel features in claims.

In the drawings which form a part of this specification, Figure 1 is a view in side elevation of such portions of a machine for perforating paper as are necessary to illustrate my invention. Figs. 2 and 3 are side elevations, respectively, of a rotary die and cutter roll for effecting the partial transverse separation of the paper. Figs. 4 and 5 are transverse sectional views of the same. Figs. 6 and 7 are views in side elevation of a rotary die and

cutter roll, respectively, of the same principle as those illustrated in Figs. 2 and 3, but of slightly-different construction. Figs. 8 and 9 are transverse sectional views of the same. Fig. 10 is an assembled view, partly in side elevation and partly in longitudinal central section, of the rewinding-frame and its correlated parts. Fig. 11 is a top view of the same. Figs. 12 and 13 are respectively a side elevation and an end elevation of a rotating bushing employed. Figs. 14 and 15 are respectively a side and an end elevation of the winding-shaft. Fig. 16 is a face view of two gear-wheels employed. Fig. 17 is a central transverse section of the same.

In the present form of my invention I provide a machine in which the web of paper passes from a source of supply (not shown) over a direction-roll, (designated in the drawings by the reference character 1,) and from thence around a die-roll 2 to another direction-roll 3, from whence it is rolled up upon a winding-shaft 4. The direction-rolls 1 and 3 and the die-roll 2 are mounted in suitable bearings upon a stationary frame 5. A cutter-roll 6 is provided, the said cutter-roll mounted in suitable bearings located beneath the die-roll 2. The said cutter-roll 6, which may be of the type shown in Figs. 3 and 7, carries one or more cutter-blades 7. The cutter-blades are preferably provided with saw-teeth, which are arranged to penetrate the web of paper at a plurality of points, but not to completely sever the same. The particular form of cutter-roll I have illustrated herein is provided with three cutter-blades. In the form of cutter-roll illustrated in Figs. 3 and 5 the said cutter-blades are secured, as by screws, to longitudinal ribs 8 upon the roll. Backing-plates 9 are provided to insure rigidity of the said cutters. In the form of cutter-roll illustrated in Figs. 6 and 8 the cutters 7 are held between clamping-plates 10 11, which are suitably secured to the roll, in this instance of cylindrical form. The die-roll 2 has one or more longitudinal grooves or dies, the number corresponding to the number of cutter-blades employed in the cutter-roll. The grooves or die portions are preferably faced with a hardened-steel facing-strip 17, and said strip may be inserted within the groove, as shown in the form of roll illustrated in Figs. 2 and 4, or the

facing-strip may be recessed into the outer face of the roll and secured thereto, as shown in the form of roll illustrated in Figs. 7 and 9.

It will be understood, of course, that either of the cutter-rolls herein described and illustrated may be used with either of the die-rolls and that other forms of die and cutter rolls may be employed within the scope of this invention.

The paper is perforated transversely while passing between the die and cutter rolls, and the said die and cutter rolls are accurately adjusted with respect to each other so that the edges of the cutters and dies are never in actual contact, while at the same time they pass in very close proximity to each other. To insure the correct relationship of the two rolls relatively with each other, an exceedingly accurate adjustment is necessary, and I have devised a special form of gearing to accomplish such purpose.

I provide on the shaft of one of the rolls 2 or 6 an ordinary gear-wheel, and the other I provide with a gear-wheel which is adjustable. Certain portions of the gear-teeth of the said gear-wheel are arranged to be adjustable with relation to other parts of the said gear-teeth, and means are provided for locking the adjustable parts in the position to which they may have been adjusted. As herein shown, the gear-wheel comprises a hub or base 12 (see more particularly Figs. 16 and 17) and two gear-rings 13 and 14. The gear-rings 13 and 14 are mounted upon the hub 12 and are rotatably adjusted thereon. They may be adjusted to a desired position, and bolts 15 are provided whereby they may be locked in such position. By use of such adjustable gear-wheel an extremely delicate adjustment between the die and cutter rolls is permitted, and by setting one of the gear-rings slightly in advance of the other wear in the teeth of either the adjustable or the stationary gear-wheel may be compensated for.

The paper may be longitudinally subdivided by rotary slitting-knives 18, carried by arms 19, pivotally mounted at 20 upon the frame 5. The paper in its partially transversely separated and longitudinally-divided condition is rolled up upon a winding-shaft 4, as aforesaid, the winding-shaft 4 being suitably mounted upon the swinging frame 21. The swinging frame 21 comprises two side arms 22 and a tie-bar 23, connecting them. The frame as a whole is mounted upon bushings 24, secured upon the frame 5 and concentrically with the winding drive-shaft 25. The winding drive-shaft 25 is driven by suitable gearing connected with the die and cutter rolls and transmits rotary movement through a belt upon belt-wheels 26 and 27 to a rotary bushing 28, suitably mounted in the upper end of one of the side arms 22 of the swinging frame. The winding-shaft engages at one end with the rotary bushing 28, and at the other end the said shaft has a bearing in a sliding bushing 29, which is mounted in the

upper end of the other arm 22 of the said swinging frame. The inner end of the bushing 28 has an irregular recess into which a correspondingly-formed end of the winding-shaft 4 is arranged to fit. A sliding pin 30 is mounted in the rotary bushing 28, and the end thereof is adapted to enter a recess in one end of the said winding-shaft. A suitable spring stop-pin 31 holds the sliding pin in position and prevents accidental displacement thereof. The sliding bushing 29 has a pin 32 secured thereto, which extends through a slot 33 in the upper end of the opposite arm 22, as shown, and by manipulation of the said pin 32 the sliding bushing may be moved longitudinally in its housing. The winding-roll 4 may thus be very easily removed or replaced by moving the sliding pin 30 in one direction, which may be done by a slight withdrawal of the stop-pin 31 and by moving the sliding bushing 29 in the other direction. A very simple operation is here necessary for the removal or replacement of a winding-roll, and the time it has hitherto taken to remove and replace such a winding-roll is very largely reduced, and the output of such machinery is hence considerably increased.

It is obvious that modifications of the particular construction and combination of parts herein set forth may be resorted to within the spirit and scope of my invention.

What I claim is—

1. In a machine for perforating paper, the combination with suitable perforating mechanism, of a swinging frame adapted to support a rewinding-shaft, a rewinding-shaft supported thereby, a revoluble bushing with which the said shaft has a removable connection, and a sliding bearing-bushing arranged to engage the opposite end of the said shaft.

2. In a machine for perforating paper, the combination with suitable perforating mechanism, of a rewinding-shaft, a revoluble bushing with which said shaft has a removable connection, means for locking the shaft in its engagement with the revoluble bushing, and a sliding bearing arranged to normally support the opposite end of the said shaft and to be slid out of engagement therewith when desired.

3. In a machine for perforating paper, the combination with suitable perforating mechanism, of a rewinding-shaft, a revoluble bushing with which one end of the said shaft has a removable connection, a sliding pin concentrically arranged within the said bushing and adapted to extend into the said shaft, a sliding bearing arranged to normally support the opposite end of the said shaft, and means whereby the said bearing may be moved out of engagement with the said shaft when desired.

4. In a machine for perforating paper, the combination of a rotary die and a rotary cutter connected together by gear-wheels, one of said gear-wheels comprising a hub and a gearing adjustably mounted thereon.

5. The combination in a machine for perforating paper of a rotary die and a rotary cutter connected together by gear-wheels, one of the said gear-wheels having two gear-rings 5 rotatably adjustable with relation to each other.
6. The combination in a machine for perforating paper of a rotary die and a rotary cutter connected together by gear-wheels, one 10 of said gear-wheels comprising a hub and two gear-rings mounted thereon, said gear-rings being rotatably adjustable relatively with each other and with the hub, together with means for locking the gear-rings and the hub together in the position to which they have 15 been adjusted.
- In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.
- SETH WHEELER.
- Witnesses:
EDGAR WHEELER,
WM. A. WHEELER.