

No. 781,270.

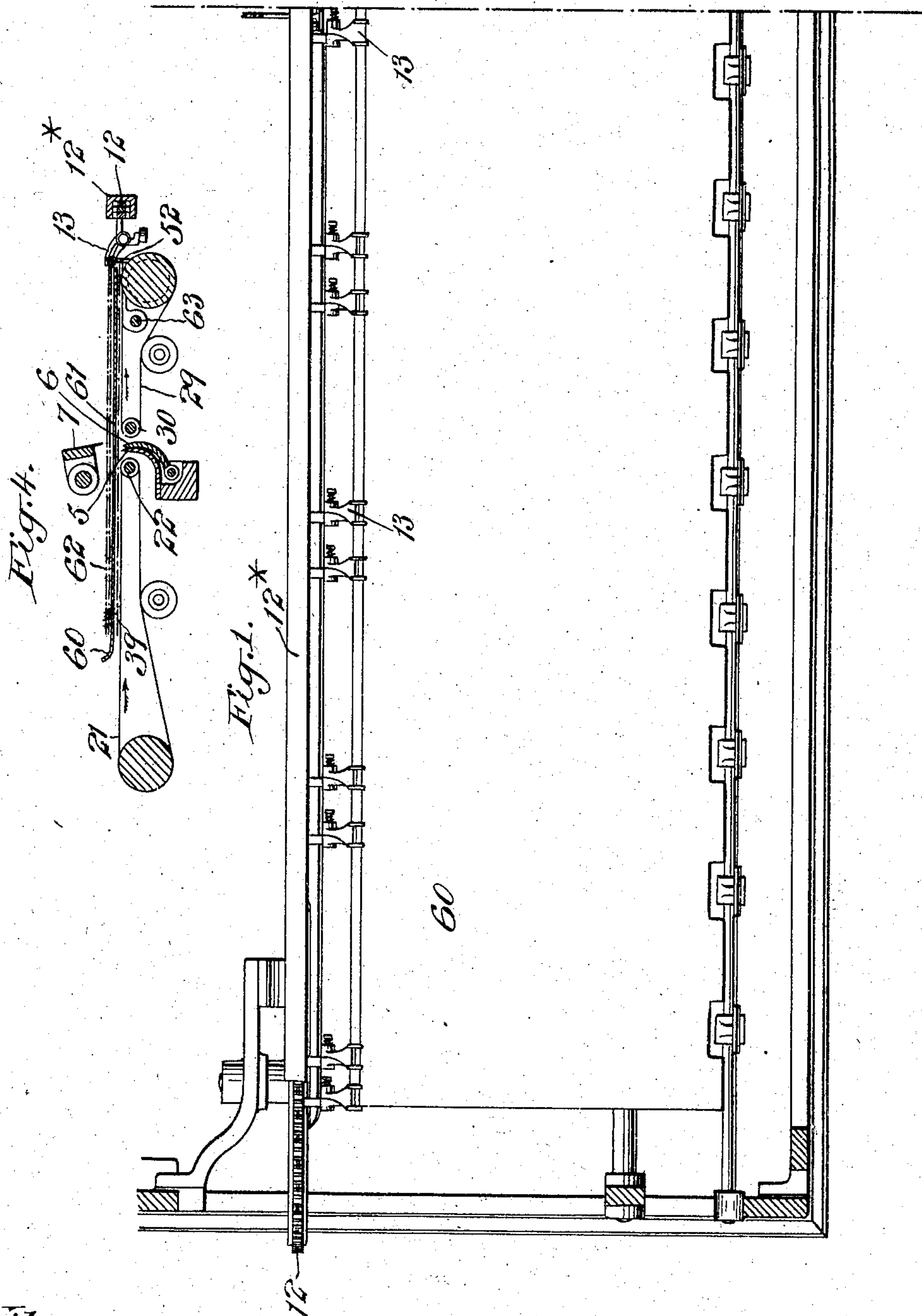
PATENTED JAN. 31, 1905.

E. H. COTTRELL.

MACHINE FOR FOLDING PAPER OR OTHER FABRICS.

APPLICATION FILED JUNE 14, 1904.

4 SHEETS—SHEET 1.



Witnesses:

J. George Barry,  
Frederick G. Hackenberg,

Inventor:  
Edgar H. Cottrell  
By attorneys  
Rowntree & Co.

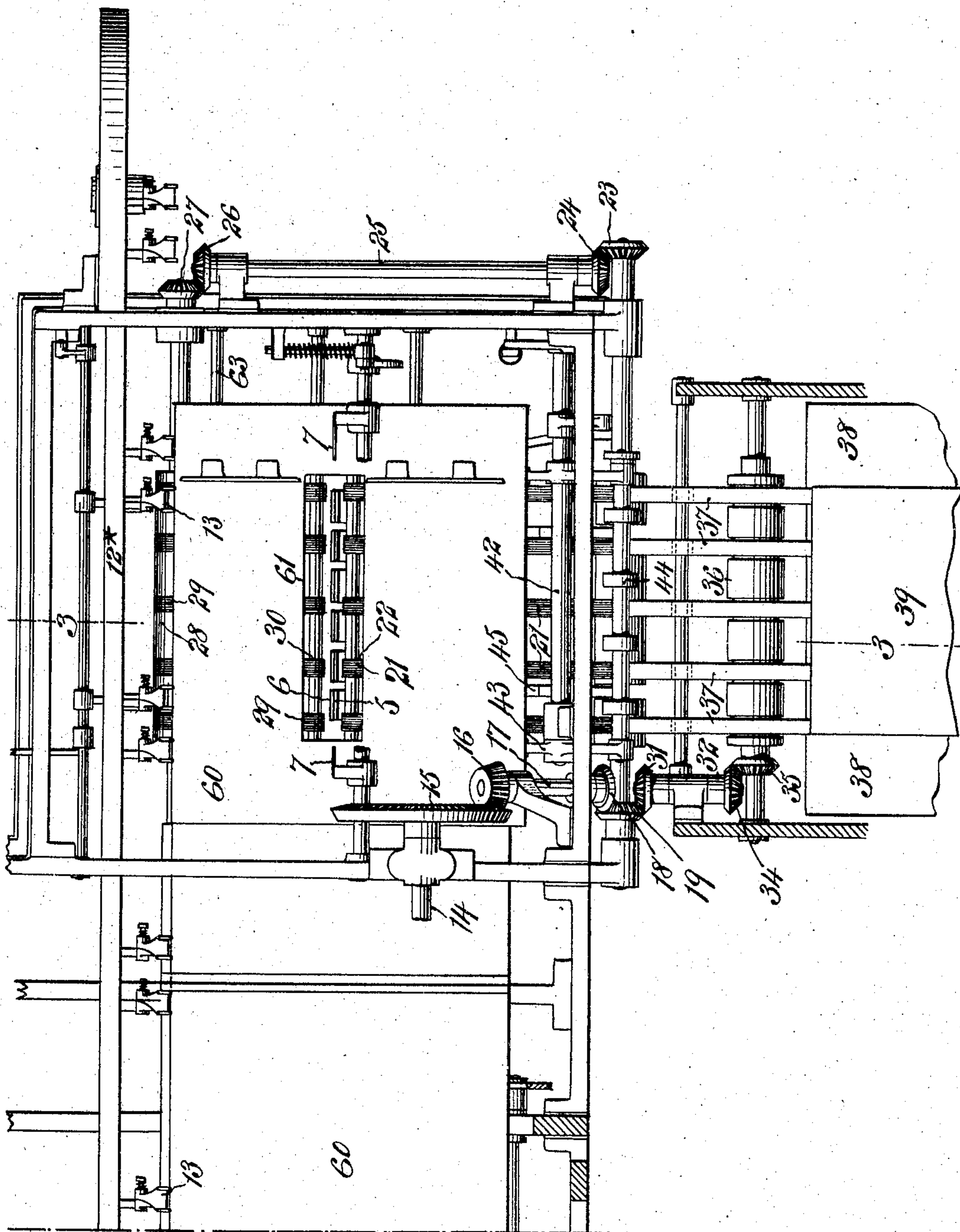
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4 SHEETS—SHEET 2.



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Fig. 1.\*

Inventor:  
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Preston & Howard



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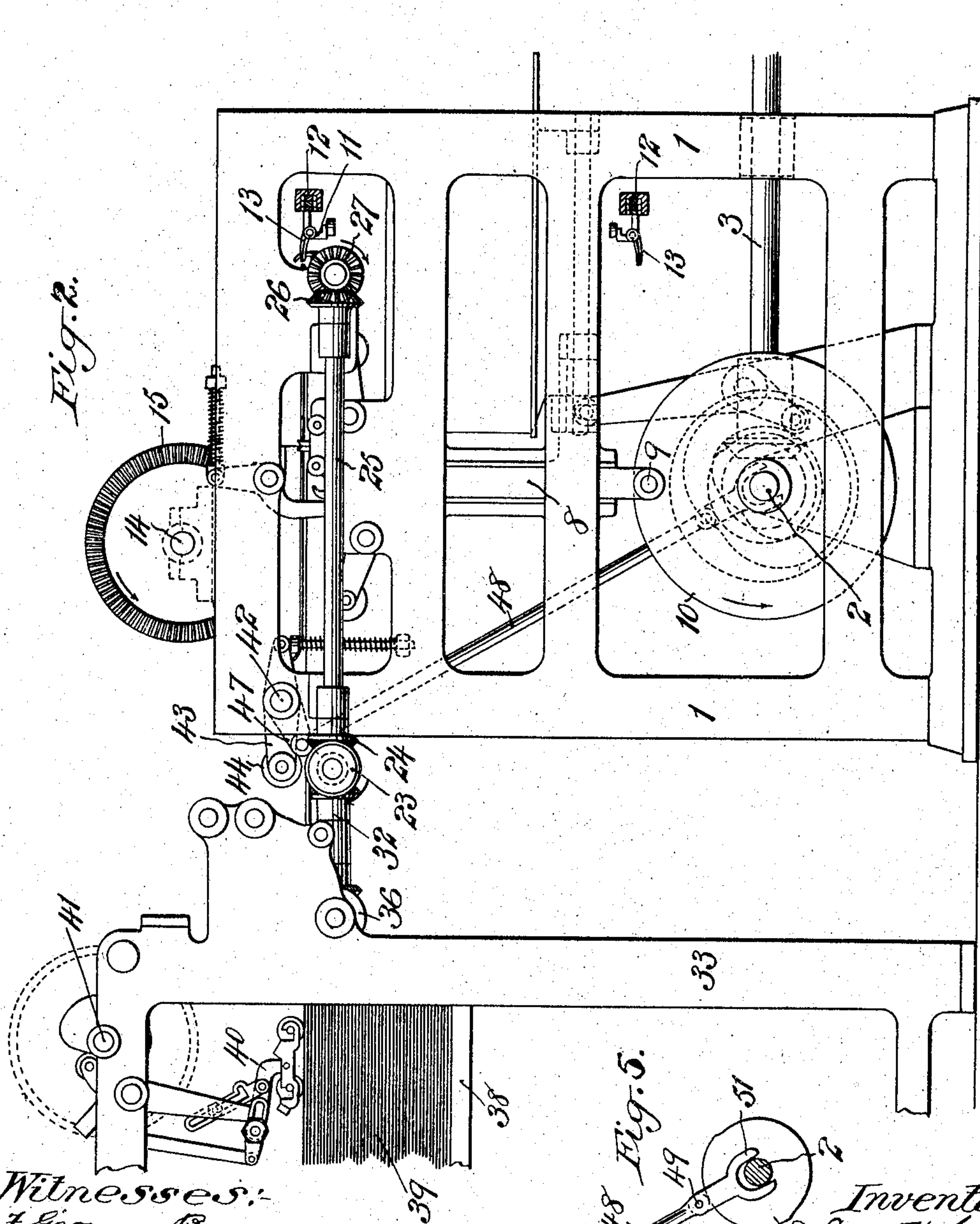
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4 SHEETS—SHEET 3.



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Fig. 5.

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by attorney  
Brown & Shuman

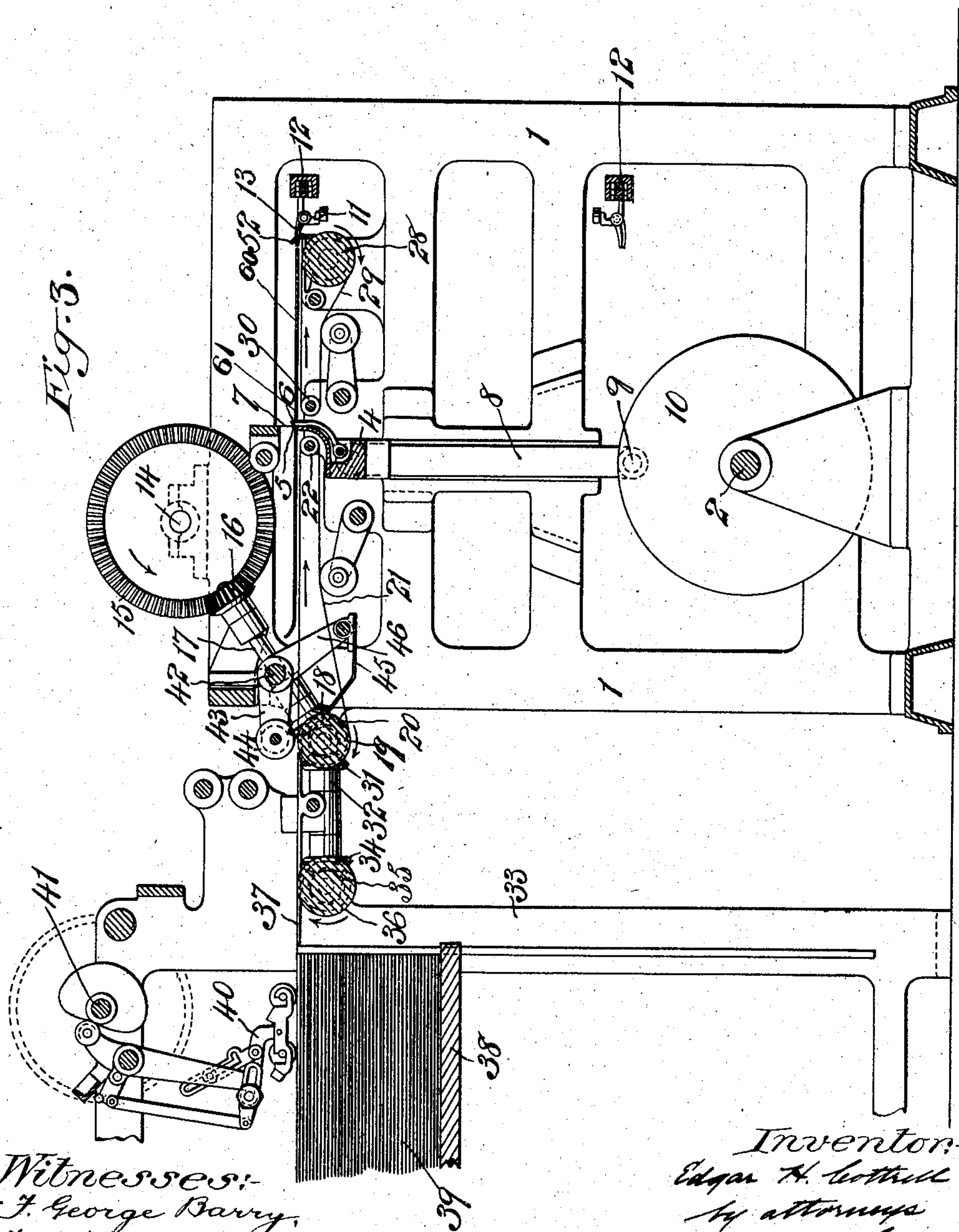
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4 SHEETS—SHEET 4.



Witnesses:  
J. George Barry,  
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# UNITED STATES PATENT OFFICE.

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C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A COR-  
PORATION OF NEW JERSEY.

## MACHINE FOR FOLDING PAPER OR OTHER FABRICS.

SPECIFICATION forming part of Letters Patent No. 781,270, dated January 31, 1905.

Application filed June 14, 1904. Serial No. 212,466.

*To all whom it may concern:*

Be it known that I, EDGAR H. COTTRELL, a citizen of the United States, and a resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Machines for Folding Paper or other Fabrics, of which the following is a specification.

The object of this invention is to collect sheets from different sources and fold them together, and especially to collect a plurality of sheets from one source and a sheet from another source and to fold them together in such manner that the last-mentioned sheet forms a cover or outside sheet to the said plurality of sheets which form a signature.

The invention consists in certain means, hereinafter described and claimed, whereby the collection and folding together of the sheets as above mentioned are performed.

It is immaterial to my invention what may be the sources of supply of sheets; but for the purpose of illustrating the invention I have represented in the accompanying drawings parts of a machine which forms the subject-matter of United States Letters Patent No. 732,338 for bringing the sheets which are to form the signatures to the folding-point and for folding them, and I have represented the cover-sheet as supplied from a pile and brought to the same point by a feeding device and carrier running transversely to the signature-sheet carrier of the patented machine above mentioned.

Figures 1 and 1\* represent a plan; Fig. 2, an elevation taken at that end of the machine which is at the right hand in Fig. 1; Fig. 3, a vertical section in the line 2 2 of Fig. 1; Fig. 4, a vertical section corresponding with Fig. 2, showing the folding device, a table on which signature-sheets are presented for folding, and the carriers by which the signature-sheets and cover or outside sheets are brought to the folding-point. Fig. 5 is a detail view of the stop-feed bar and its controlling-cam.

The framing is denoted by 1. The shaft 2,

which operates the folding device 4 5 6 7, is driven from a shaft 3. This folding device is like that described in Letters Patent No. 732,338. Its grippers are denoted by 5 and 6, and its blade is denoted by 7. The said folding device is operated from the shaft 2 by providing the usual arms 8, pivoted at 9 to the crank-disk 10, fixed to the shaft 2. It is to be understood that these parts are operated in the same manner and at predetermined intervals as fully set forth in the Letters Patent above referred to.

The endless carrier for taking the signature-sheets to the folding device is denoted by 11, and consists, as described in the Letters Patent above referred to, of an endless rack 12, of well-known construction, furnished with grippers 13 and running in horizontal ways 12\* and arranged to convey groups of sheets at the proper intervals along a suitable sheet-support, such as a table 60, to the folding device, where a cover-sheet has been fed in a direction transverse to that of the said carrier by the mechanism which will be hereinafter set forth. It will be understood that the folding-blade and grippers are arranged parallel with the direction of the run of the said carrier.

The shaft 14 for operating the reciprocating blade of the cutting device of the folding-machine is provided, as described in said Letters Patent, with a bevel-gear 15, which meshes with a pinion 16 on a short shaft 17, mounted in suitable bearings on the framing 1. This shaft 17 has a bevel-gear connection 18 19 with one of the rollers, 20, of a tape-carrier 21, which runs beneath the table 60 just near enough thereto to allow a sheet 39 to pass under the table. The other roller, 22, of this carrier 21 is mounted in proximity to the folding device. This carrier runs transversely to the signature-carrier.

The roller 20 is provided with a bevel-gear connection 23 24 with a cross-shaft 25, mounted on the framing 1, which cross-shaft also has a bevel-gear connection 26 27 with the roller



28 of a tape-carrier 29, running in the same way as 21 under the table. The carrier 29 also passes around a second roller, 30, mounted in proximity to the roller 22, so as to leave a slot between the two rollers, through which the grippers of the folding device are permitted to move to and fro upward and downward to coact with the blade thereof for folding the signatures and conveying them at predetermined intervals to a packer or other receptacle. A slot 61, corresponding with the slot between the rollers 22 30, is also provided in the table 60 for the passage through it of the folding-grippers. The two carriers 21 and 29, having their sheet-supporting surfaces in one plane and running in the same direction at the same speed and both carrying the same sheets at the same time, may be considered as parts of one carrier.

The gear 19 of the tape-carrier roller 20 also intermeshes with a bevel-gear 31 on a stud-shaft 32, mounted in suitable bearings on a framing 33, located adjacent to and at one side of the framing 1 of the folding-machine. This stud-shaft 32 has a bevel-gear connection 34 35 with a sheet-advancing roller 36, which roller projects through a table 37, carried by the said framing 33 and runs in the same direction as the tape-carriers. A table 38 forms a support for a stack of separate sheets 39, which are to serve as outside or cover sheets, to be combined with the groups of sheets by the folding device 4 5 6 7.

For the purpose of stopping the sheets 39 in the proper position for folding the said sheets along with the signature-sheets, a group of which is indicated in Fig. 4 by a double-dotted line 62, stops 52 are provided adjacent to the table 60. These stops are shown in Figs. 1 and 3 and are represented in Fig. 4 as carried by a bar 63, secured to the framing 1.

A sheet-feeding device 40 of any well-known and approved form is mounted on the framing 33 in position to feed the sheets 39 one by one onto the table 37. I have not shown the mechanism for operating the feeding device, other than the cam-shaft 41, as it forms no part of my present invention. It is also to be understood that the table 38, upon which the pile of cover-sheets rests, may be automatically raised as the pile decreases in any well-known and approved manner.

A stop-feed device is provided for permitting the feeding of the sheets from the pile 39 to the folding device at the proper intervals, which stop-feed device is controlled by a cam on the shaft 2 in the usual manner. The rock-shaft of the stop-feed device is denoted by 42, its roller-carrying arm by 43, and the roller by 44. The stop is denoted by 45 and is carried by an arm 46 in position to be brought into and out of the path of the sheet as the shaft 42 is rocked. The shaft 42 is

provided with an arm 47, to which one end of a connecting-bar 48 is attached, the other end of which bar is provided with a stud or roller 49, which engages, as shown in the detail view Fig. 5, the periphery of a cam 50 on the shaft 2. The bar 48 is provided with a fork 51, which embraces the shaft 2 for guiding the bar in its longitudinal movements.

In operation the movements of the several mechanisms are so timed that a sheet is first fed from the pile 39 into engagement with the advancing roller 36. The stop 45 engages the head of the sheet until the proper time comes for feeding the sheet to the folding device. The stop 45 is then withdrawn and the roller 44 brought into position to grip the sheet between it and the carrier-roller 19. This will cause the carrier 21 to feed the sheet across the table 60 to the folding device, the carrier 29 receiving the front part of the sheet as it passes under the slot 61 in the table and over the slot formed between the carrier-rollers 22 30. The sheet is thus fed until its head engages the stop 52. The carrier 11 12 13 has been in the meantime operated to bring a group of sheets for a signature into position over the table and over and opposite to the separate cover-sheet under the table. The grippers 5 6 then come upward between the rollers 22 30 and through the slot in the table 60 and crease both the cover-sheet and the group of signature-sheets together over the blade 7 and grip the crease thus formed, which includes all the sheets, and then in their descent they will produce the folding of all the sheets together by a single operation.

While I have described this invention as applicable for the combination of cover-sheets with groups of sheets forming signatures, it is to be understood that the lower sheets may not be simply cover-sheets, but may be sheets used to enlarge the signatures on the outsides thereof.

What I claim as my invention is—

1. In a folding-machine, the combination of a sheet-support, a carrier for placing sheets upon said support, two carriers running transversely to the one first mentioned for placing other sheets under said support, and a folder for folding together by one operation the sheets placed respectively above and below said support.

2. In a folding-machine, the combination of a sheet-support, a sheet-carrier for placing sheets on said support, a carrier running in a direction transverse to that of the first-named carrier for placing sheets under said support, and a folder arranged parallel with the run of the first-named carrier for folding together by one operation the sheets placed respectively on and under said support.

3. In a folding-machine, the combination of a sheet-support, a carrier for placing sheets on said support, two carriers running in a di-

rection transverse to that first mentioned for  
placing sheets under said support, and a folder  
consisting of folding-grippers having a to-  
and-fro motion between said two carriers and  
5 a folding-blade arranged above all the car-  
riers.

In testimony that I claim the foregoing as

my invention I have signed my name, in pres-  
ence of two witnesses, this 10th day of June,  
1904.

EDGAR H. COTTRELL.

Witnesses:

FREDK. HAYNES,  
LIDA M. EGBERT.