

No. 792,291.

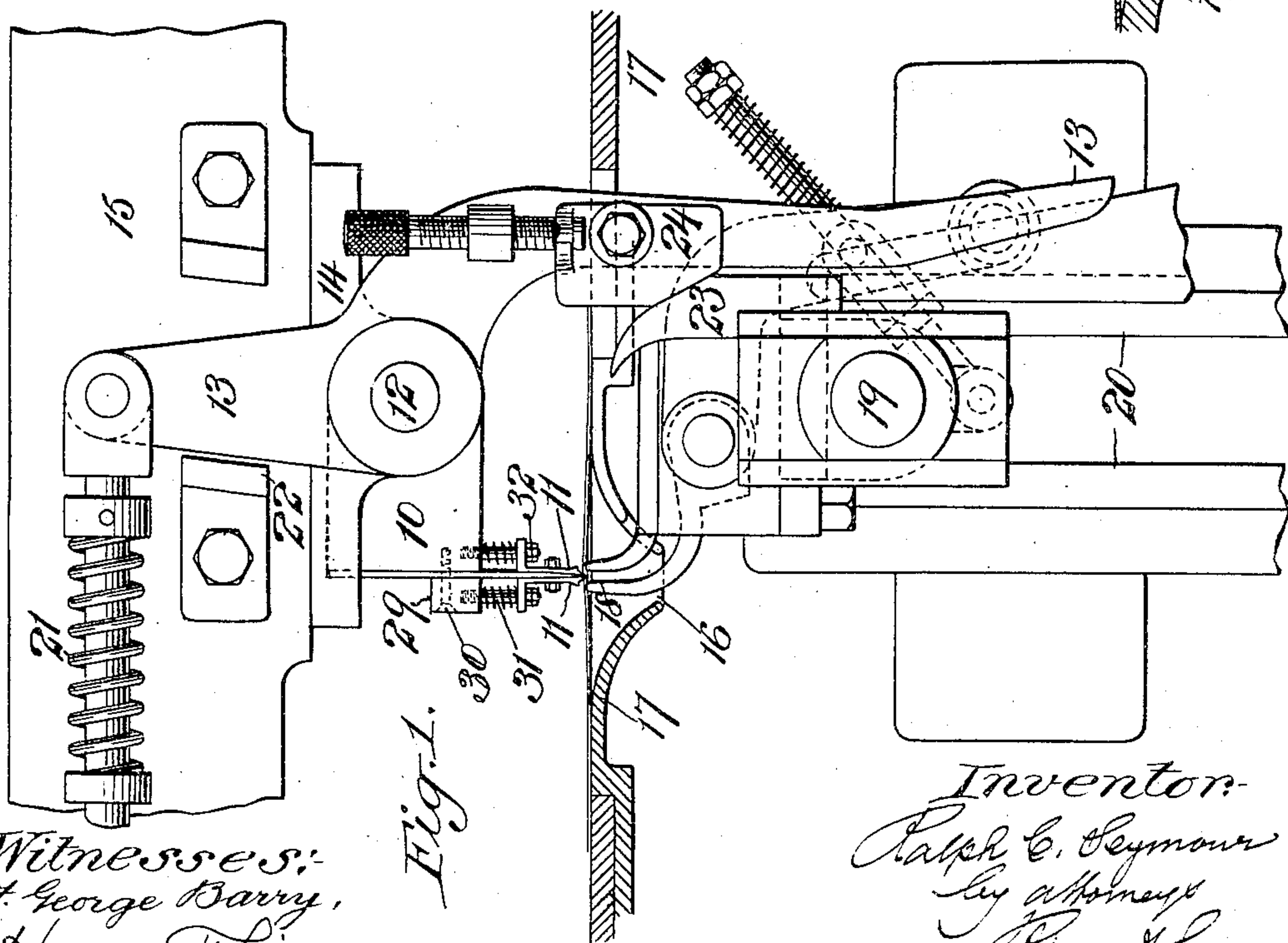
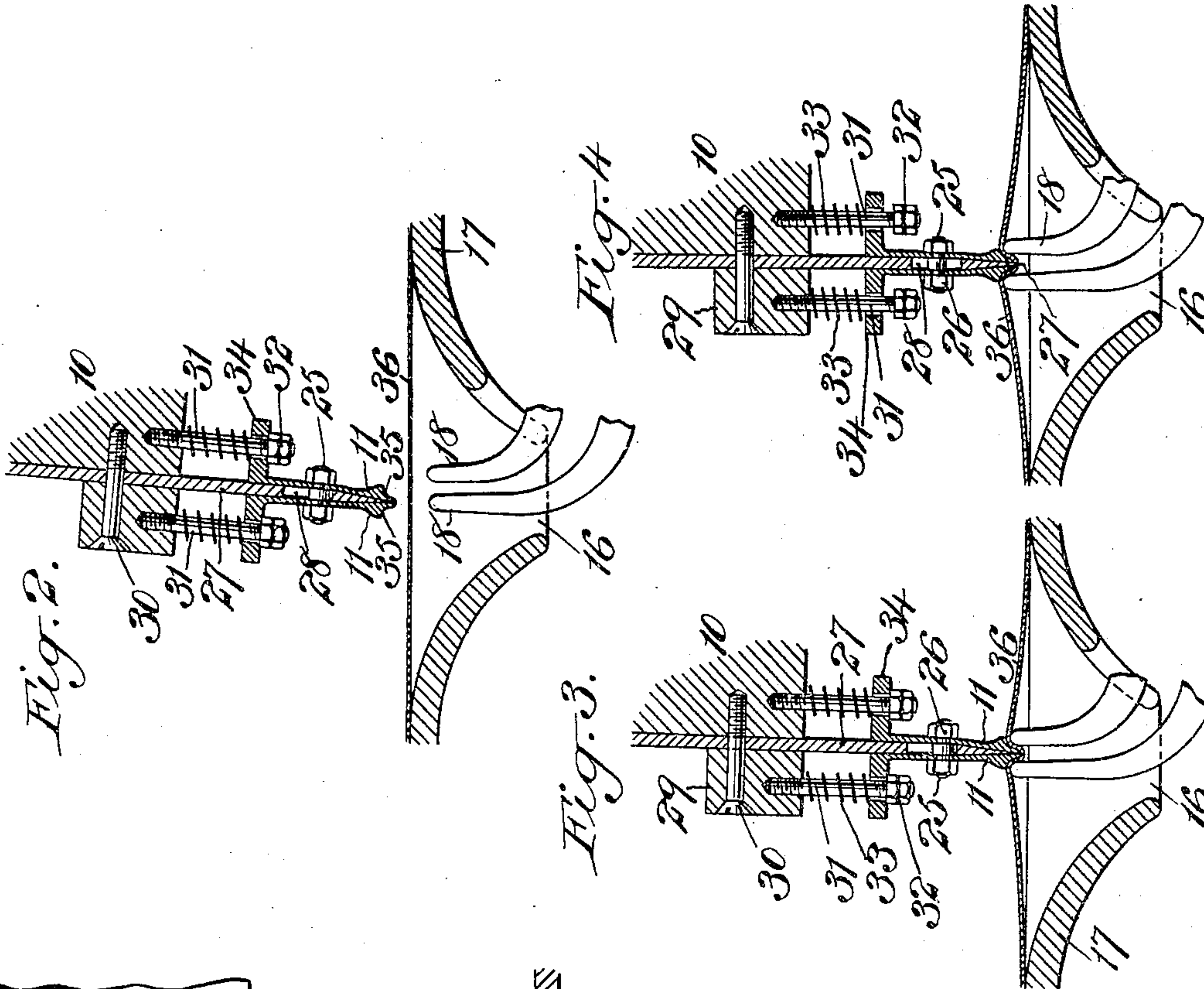
R. C. SEYMOUR.

PATENTED JUNE 13, 1905.

MECHANISM FOR DOUBLING OR FOLDING AND CUTTING PAPER OR OTHER FABRICS.

APPLICATION FILED DEC. 20, 1904.

2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

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MECHANISM FOR DOUBLING OR FOLDING AND CUTTING PAPER OR OTHER FABRICS.

SPECIFICATION forming part of Letters Patent No. 792,291, dated June 13, 1905.

Application filed December 20, 1904. Serial No. 237,628.

To all whom it may concern:

Be it known that I, RALPH C. SEYMOUR, a citizen of the United States, and a resident of the borough of Manhattan, in the city and State of New York, have invented a new and useful Improvement in Mechanism for Doubling or Folding and Cutting Paper or other Fabrics, of which the following is a specification.

This improvement relates to a device which consists in part of a blade, hereinafter referred to as the "creasing-blade," and in part of grippers which crease a sheet on said blade and fold or double it in the act of drawing it from the blade.

The object of the said improvement is to sever the sheet in the crease so formed by an operation continuous to that of forming the crease; and to that end the said improvement consists in the mechanism hereinafter described and claimed, the principal elements of which are the creasing-blade and grippers above referred to and a cutting-knife.

In the accompanying drawings two examples of my improvement are represented, illustrating its application in connection with the combinations of creasing-blade and grippers, which are respectively the subjects of United States Patents Nos. 668,393 and 668,394.

Figure 1 is a side view, partly in section, illustrating the application of my improvement in connection with the subject of the first of the above-mentioned patents. Figs. 2, 3, 4 are diagrams, on a larger scale than Fig. 1, of the creasing-blade, the grippers, and the cutting-knife and part of the stock to which they are attached, corresponding with Fig. 1 and illustrating successive stages of their operation; Fig. 5, a view similar to Fig. 1, but illustrating the improvement in connection with the subject of Patent No. 668,394; Fig. 6, a transverse section, on a larger scale, of the creasing-blade and knife and part of their stock, corresponding with Fig. 5; Fig. 7, a face view corresponding with Fig. 6; Fig. 8, a transverse sectional view of the blade, knife, and stock, illustrating a modification of the

invention; Fig. 9, a detail to be hereinafter explained.

I will first describe the example shown in Fig. 1, in which the stock 10 for the creasing-blade 11 is pivoted at its ends by pivots 12 in fixed bearings 14, supported by a stationary part 15 of the framing of the folding-machine, the said blade being arranged opposite to a slot 16 in a table 17, on which the sheets to be folded are placed and through which slot the grippers 18 pass to crease the sheet on the blade. The grippers are carried by a bar 19, which has a vertical reciprocating movement in stationary guides 20. The opening and closing of these grippers at the proper times for forming the crease of the sheet on the blade 11, then drawing off the sheet from the blade and downward through the slots 16 in the table, and finally releasing it may be produced by any suitable means—as, for instance, by the means described in United States Patent No. 668,393. The upward and downward movement of the blade is represented, as in the patent just mentioned, as produced through a lever 13, fast on one end of the stock 10. The said lever is so acted upon by a spring 21 to hold it back from a fixed stop 22 in a position to keep the blade raised sufficiently above the table for the sheet to be folded to pass under it; but when the creasing and the commencement of the doubling operation is to be performed the said lever is actuated by a wedge-shaped cam 23, attached to the gripper-bar 19, which ascends against an adjustable piece 24 on the lever, and so brings the upper part of the lever against the stop 22 and so holds the blade in the position shown in Fig. 4, with its edge about or nearly on a level with the face of the table to permit the creasing of the sheet upon it by the ascent of the grippers.

The blade 11 instead of being single, as described in the patents hereinbefore mentioned, is double—that is to say, it is formed of two corresponding blades or members fastened firmly together by any suitable number of short screw-studs 25, one of which is rep-

resented separately in Fig. 9, and nuts 26, screwed onto each of the ends thereof, said studs being provided with two shoulders which keep the upper parts of said blade members
 5 apart a sufficient distance for the cutting-knife 27 to pass freely between them, while the nuts hold the said members together in such manner that their lower edges are always kept even with each other and that when the said
 10 edges come close together they form practically one edge for the creasing and doubling of the sheet, the said edge not being sharp enough to cut. The said blade members are, however, so made elastic that although their
 15 lower edges may remain normally close together and that they will so form a sheath to the knife the said edges may be forced apart by the wedge-like action of the thin tapered edged portion of the knife, and so allow the
 20 edge of the latter to pass out from between them for cutting the sheet in the crease which they had formed, and that after the withdrawal of the edge of the knife within them they will come together again. As the screw-
 25 studs pass through the knife, slots 28 are so provided for them in the latter as to permit the proper movement of the knife within the blade.

Both the blade 11 and the cutting-knife 27
 30 are attached to the same stock 10; but in order to permit the necessary movement of the one relatively to the other the knife is fixedly attached by a clamp 29 and screws 30 and the blade 11 is yieldingly attached to the stock by
 35 means of screw-studs 31, nuts 32, and springs 33, the said studs being screwed fixedly into the stock and passing through holes in flanges 34, provided on the blade members, the springs being applied between the stock and said
 40 flanges and the nuts screwing onto the studs under said flanges. The nuts so applied attach the blade to the stock, and the springs serve to so press the blade 11 downward as to cause the knife to be entirely sheathed within
 45 it, as shown in Figs. 1, 2, and 3, when the blade is not so pressed back upon the knife by the grippers 18, as shown in Fig. 2, as to cause the protrusion of the edge of the knife from the edge of the blade. The nuts also
 50 serve to adjust the proper relation between the edges of the knife and the blade shown in Figs. 1, 2, and 3. The springs must be strong enough to resist the tendency of the grippers to push back the blade upon the knife until
 55 the grippers have produced the crease in the sheet over the edge of the blade. To facilitate the pushing back of the blade by the grippers, the two members of the blade are provided with shoulders 35 to receive through
 60 the sheet necessary pressure of the grippers to force back the blade.

I will now explain with reference to Figs. 2, 3, 4 the operation of doubling and cutting as performed by the above-described example
 65 of my invention.

A sheet 36 having been laid upon the table 17 while the creasing-blade and knife are raised and the grippers depressed, as shown in Fig. 2, the edge of the blade being entirely within the self-closing sheath constituted for
 70 it by the elastic members of the blade, the grippers then rise, and the blade and knife descend a little way together, the knife still sheathed in the blade and the edge of the blade being between the ends of the grippers,
 75 as shown in Fig. 3, the crease being thus formed in the sheet. At a point in the further continued upward movement of the grippers and downward movement of the stock 10 the descent of the blade is arrested by the
 80 grippers and the crease of the paper between them, and the further continued movements of the grippers and stock cause the knife to protrude between the blade members and sever the paper in the crease which has been formed.
 85 This protrusion of the knife through the blade is permitted by the springs 33, which provide for the yielding of the blade during the final movements of the knife and grippers. The severing of the sheet having been thus
 90 performed, the grippers descend with the two severed portions of the sheet between them, doubling the said portions as they carry them down through the slot in the table 17 and delivering them to any carrier or receptacle that
 95 may be provided for them.

The example of the invention illustrated by Figs. 5 and 6 only differs from that illustrated by Figs. 1, 2, 3, 4 in that the stock 10 for the
 100 creasing-blade and cutting-knife instead of being organized for upward and downward movements of the blade and knife is fixedly attached to the machine-framing 15 and the creasing and cutting are performed entirely
 105 by the upward movement of the grippers.

In the example shown in Fig. 8 the creasing-blade 11* is single, the cutting-knife 27 is fixedly attached to the fixed stock 10, and the creasing-blade is fitted to slide up and
 110 down between the knife and the stock under the control of a spring, so that its edge may have an upward and downward movement relatively to the edge of the cutting-knife like that of the two-membered blade 11 in the
 115 other described examples of the invention.

If the cutting-knife should be omitted from either of the examples shown in Figs. 1 to 7, the creasing-blade constructed as described would operate as a folding-blade, as in Let-
 120 ters Patent No. 668,393 or 668,394.

In the foregoing description the operation of creasing, severing, and doubling have been described as performed on a sheet; but it is obvious that they may be performed in the
 125 same way on two or more sheets placed together one upon another.

What I claim as my invention is—

1. Mechanism for cutting and doubling sheets, comprising reciprocating grippers, a
 130 creasing-blade and a knife, the said blade and

knife movable the one relatively to the other for first forming a crease in a sheet between the grippers and afterward severing the sheet in the so-formed crease.

5 2. Mechanism for cutting and doubling sheets, comprising a creasing-blade and a knife to the edge of which said blade forms an elastic self-closing sheath.

10 3. Mechanism for cutting and doubling sheets, comprising a cutting-knife, a creasing-blade composed of two elastic members capable of closing on the edge of said knife and of opening to permit the outward passage of said edge, and means for moving the knife
15 inward and outward between said members.

4. Mechanism for cutting and doubling sheets, comprising a stock, a knife fixedly secured to said stock, a creasing-blade consisting of two members attached to the stock one
20 on each side of the knife, and springs applied between said members and the stock.

5. Mechanism for cutting and doubling sheets, comprising a stock, a knife fixedly attached to said stock, a creasing-blade consisting of two members attached to the stock one
25 on each side of the knife, springs between said members and the stock and adjusting-screws for adjusting the relation between the edge of the creasing-blade and knife.

30 6. Mechanism for cutting and doubling sheets, comprising a stock, a knife fixedly attached to said stock, a creasing-blade consisting of two flanged members attached to the

stock one on each side of the knife, springs between the flanges of said members and the
35 stock and adjusting-screws for adjusting the relation between the edge of the creasing-blade and knife.

7. Mechanism for creasing and doubling sheets, comprising a stock, a creasing-blade
40 yieldingly attached to said stock, and grippers for creasing sheets over the edge of said blade.

8. Mechanism for creasing and doubling sheets, comprising a stock, a creasing-blade yieldingly attached to said stock, and recip-
45 rocating grippers for creasing sheets over the edge of said blade.

9. Mechanism for creasing and doubling sheets, comprising a creasing-blade having
50 shoulders near its creasing edge and grippers coöperating with said edge and shoulders for forming the crease in a sheet.

10. Mechanism for creasing and doubling sheets, comprising a creasing-blade having
55 shoulders near its creasing edge and reciprocating grippers coöperating with said edge and shoulders for forming the crease in a sheet.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 17th day of Decem-
60 ber, 1904.

RALPH C. SEYMOUR.

Witnesses:

FREDK. HAYNES,
F. GEORGE BARRY.