

(No Model.)

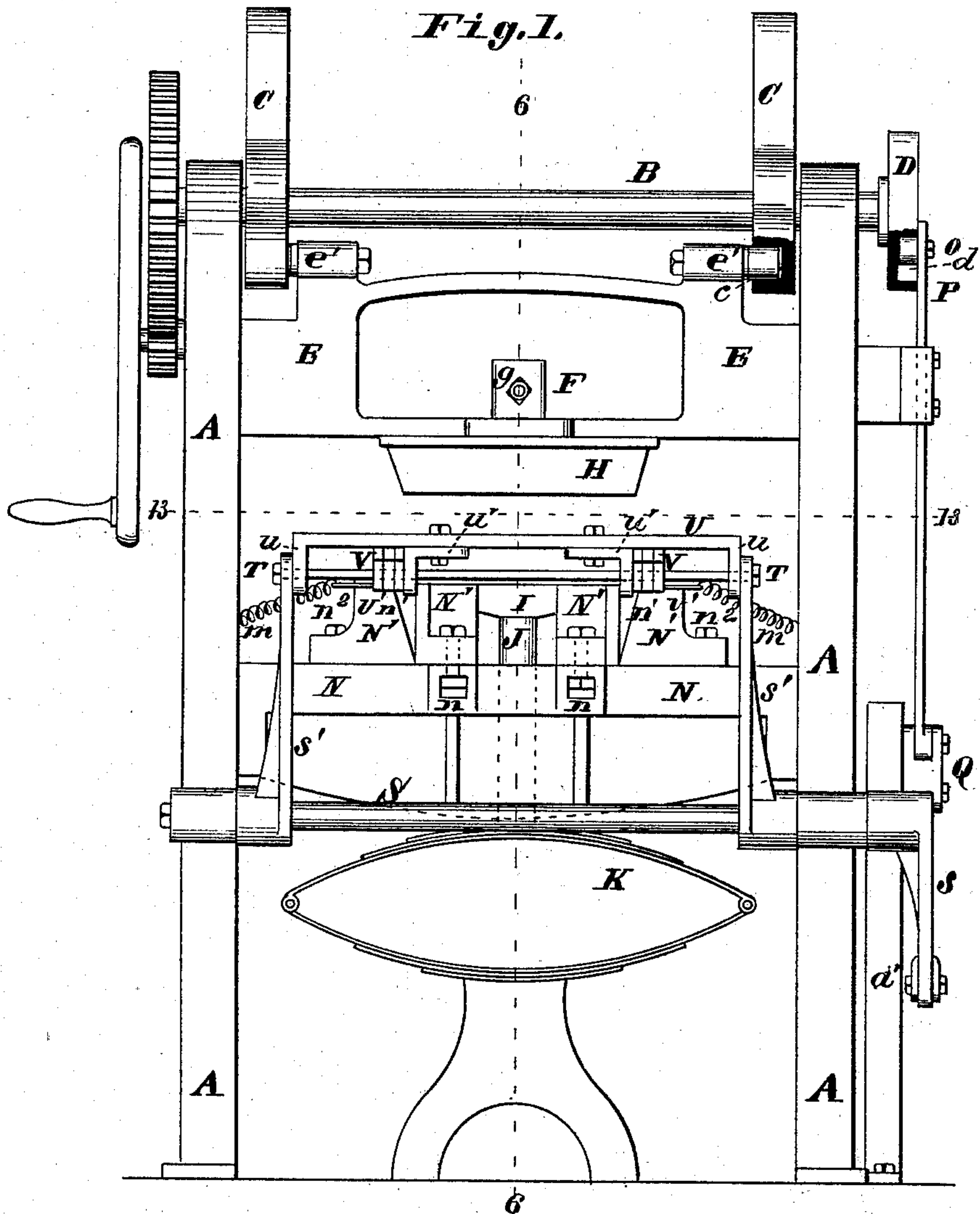
5 Sheets—Sheet 1.

R. J. STIRRAT.

MACHINE FOR FORMING SHEET METAL PANS.

No. 262,852.

Patented Aug. 15, 1882.



Attest:
Charles Pickles
Geo. H. Knight.

Inventor:
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By Knight & Bro.
Atty

(No Model.)

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Fig. 2.

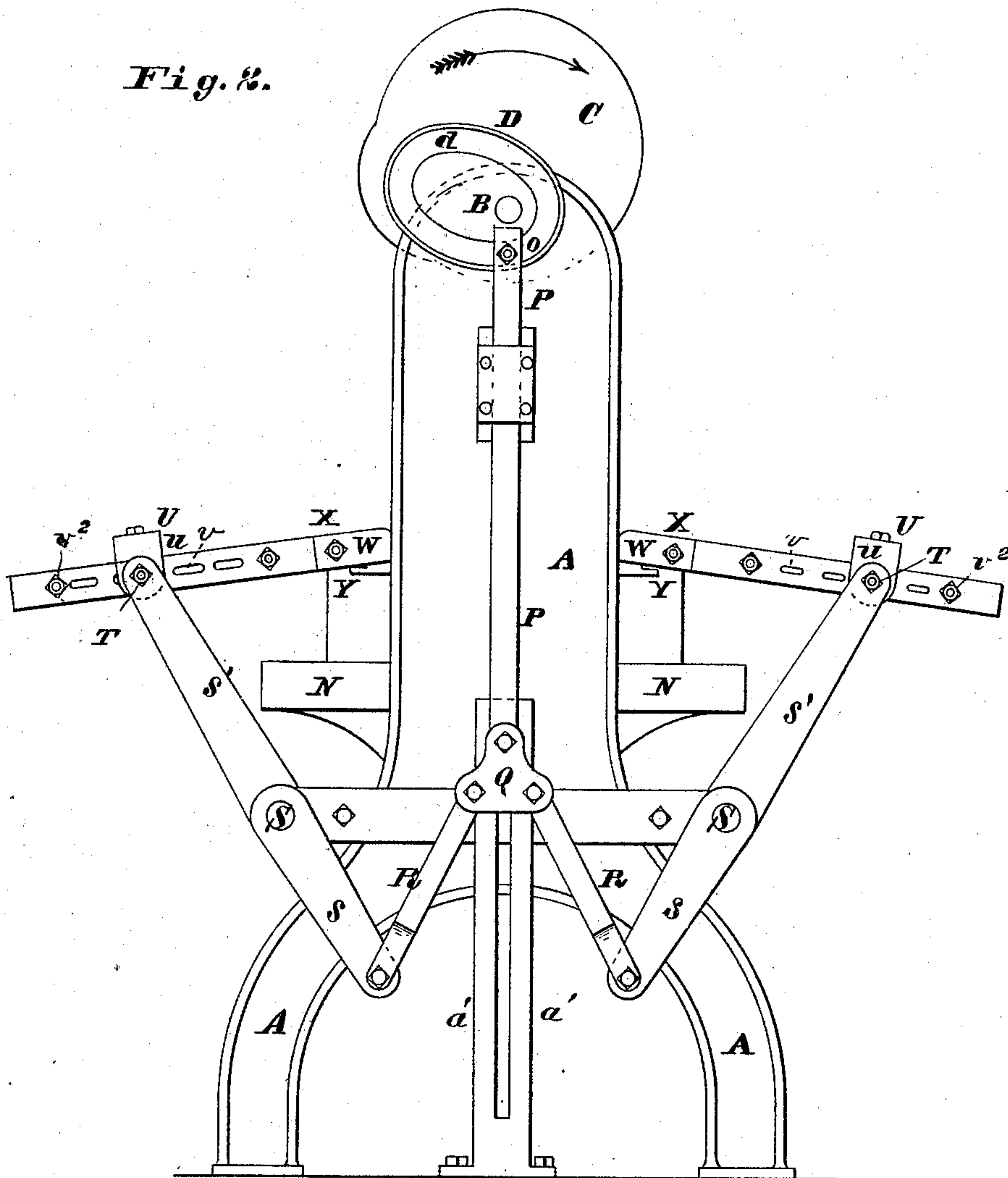


Fig. 3.

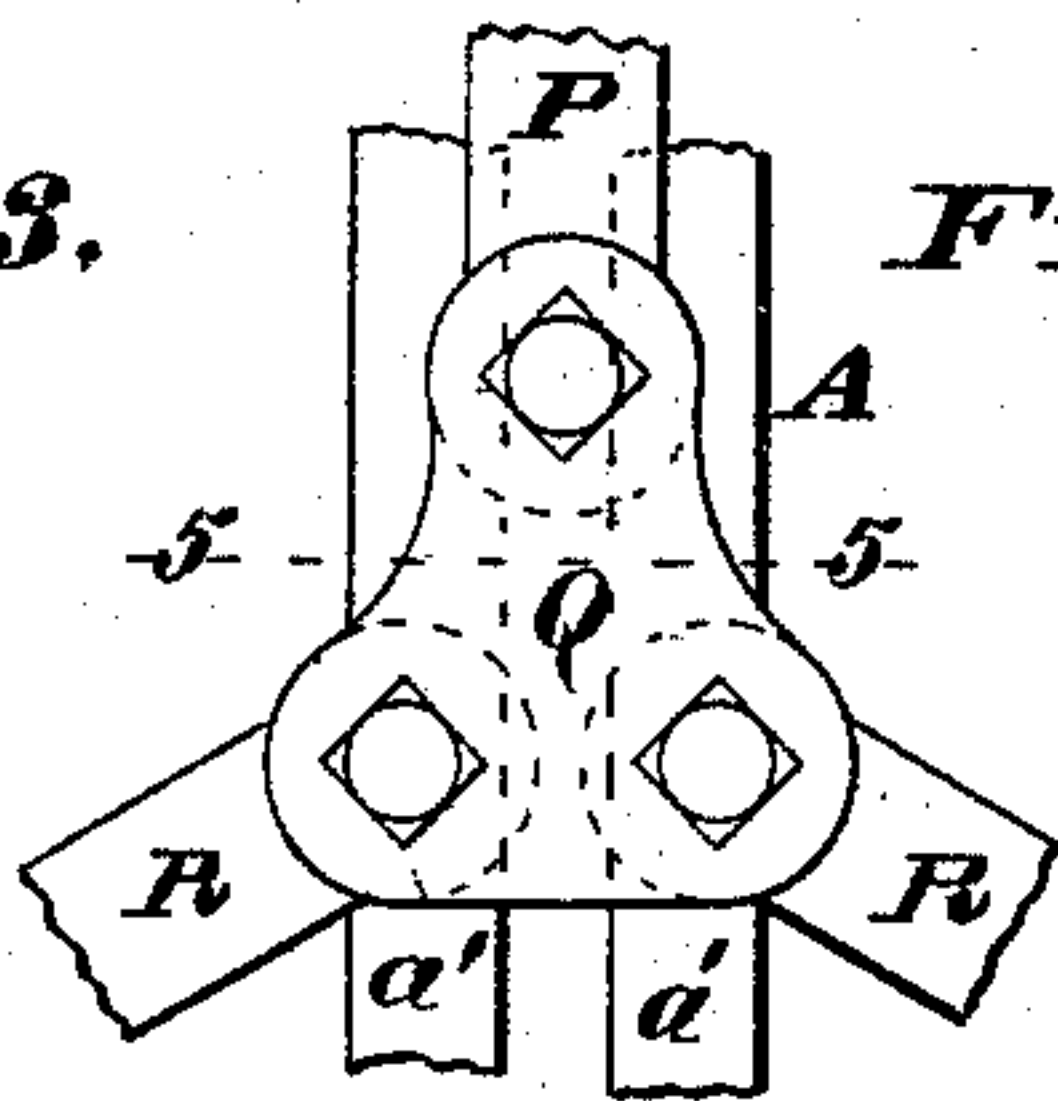


Fig. 4.

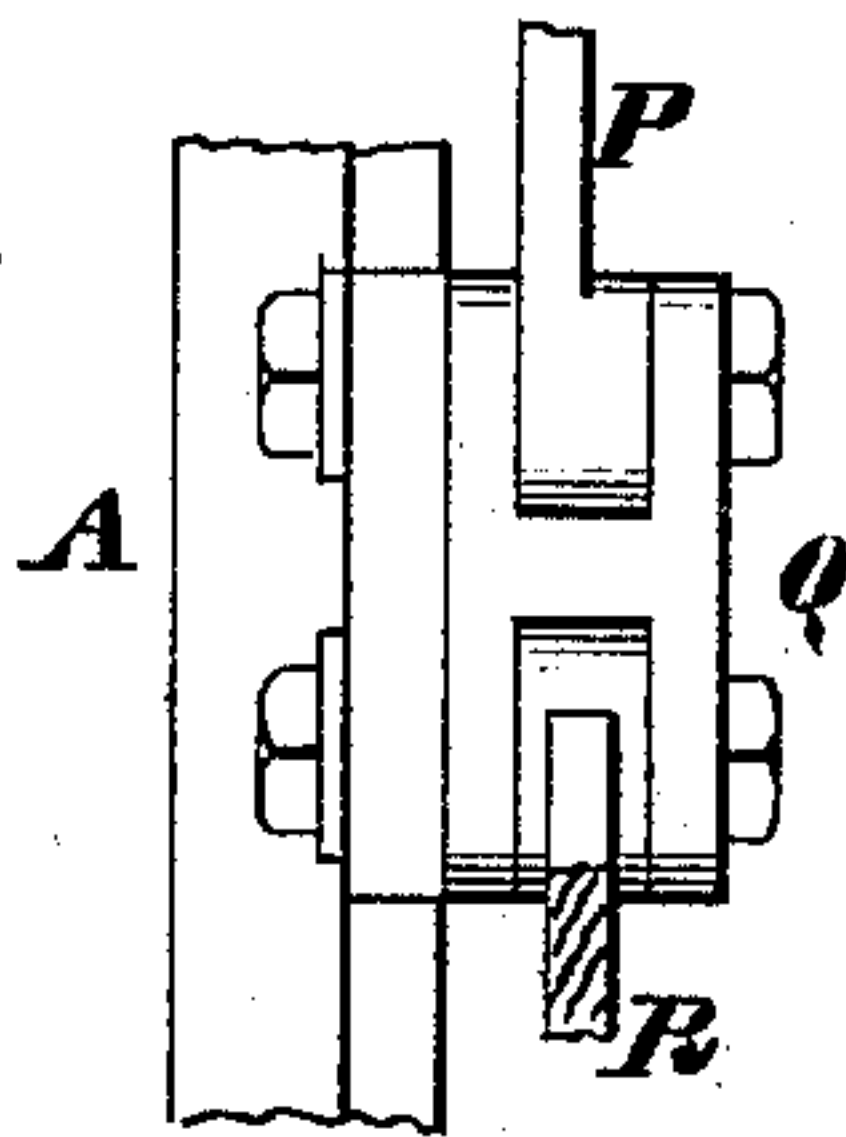
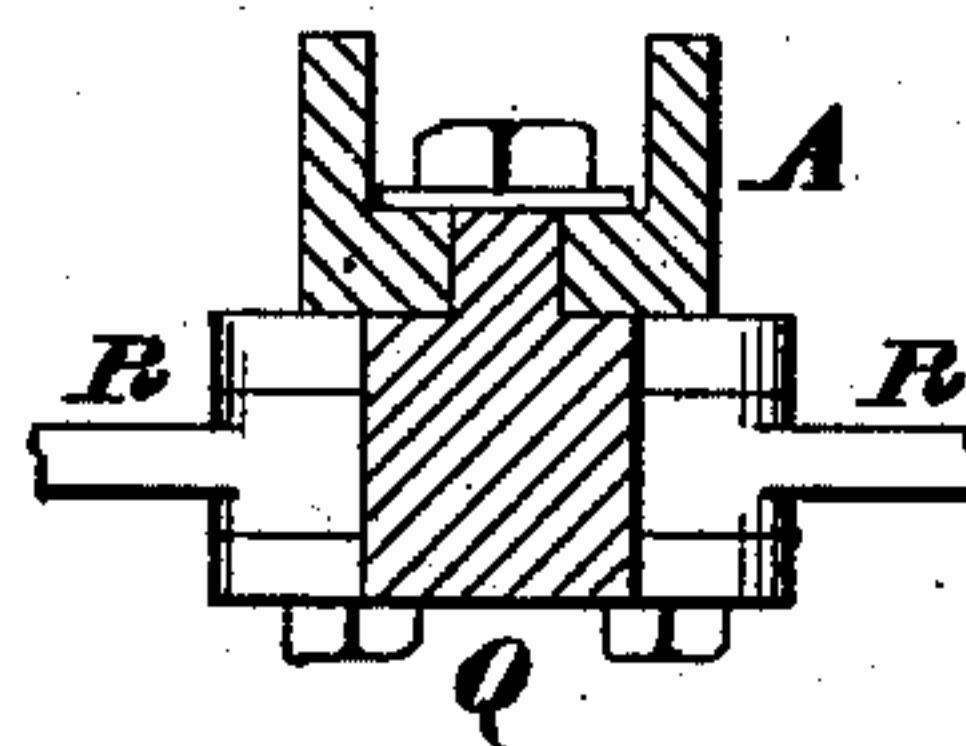


Fig. 5.



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Fig. 6.

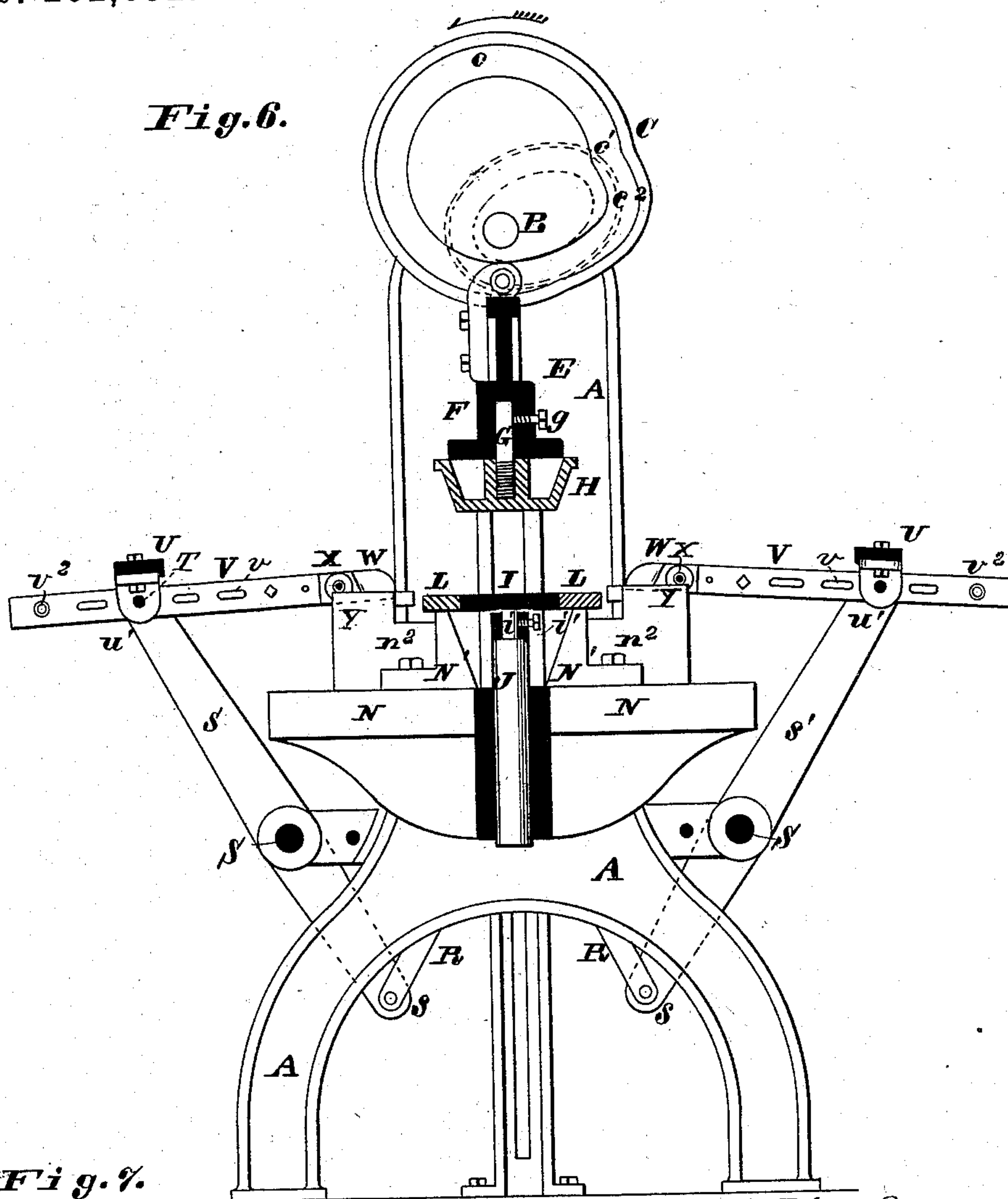
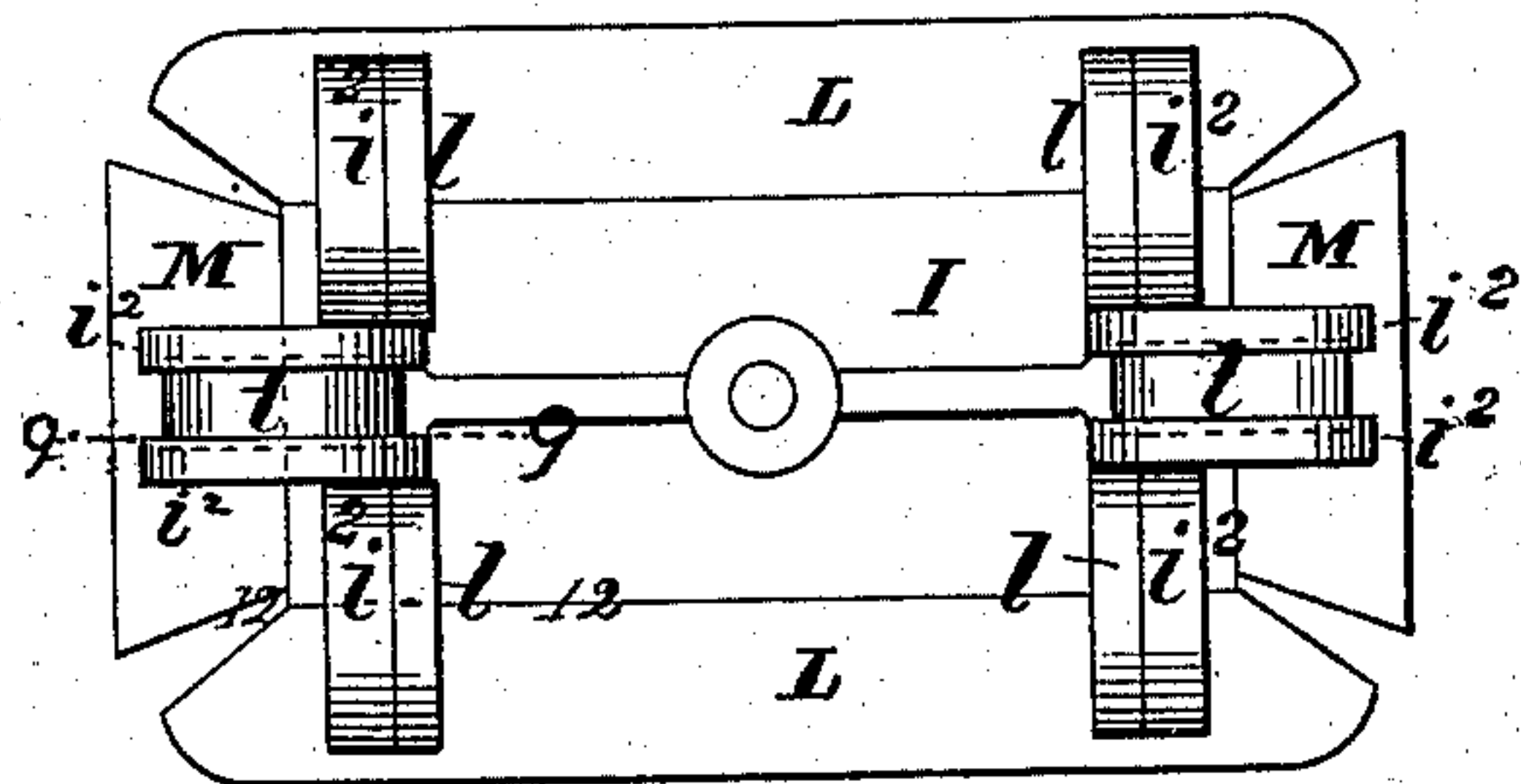


Fig. 7.



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Fig. 8.

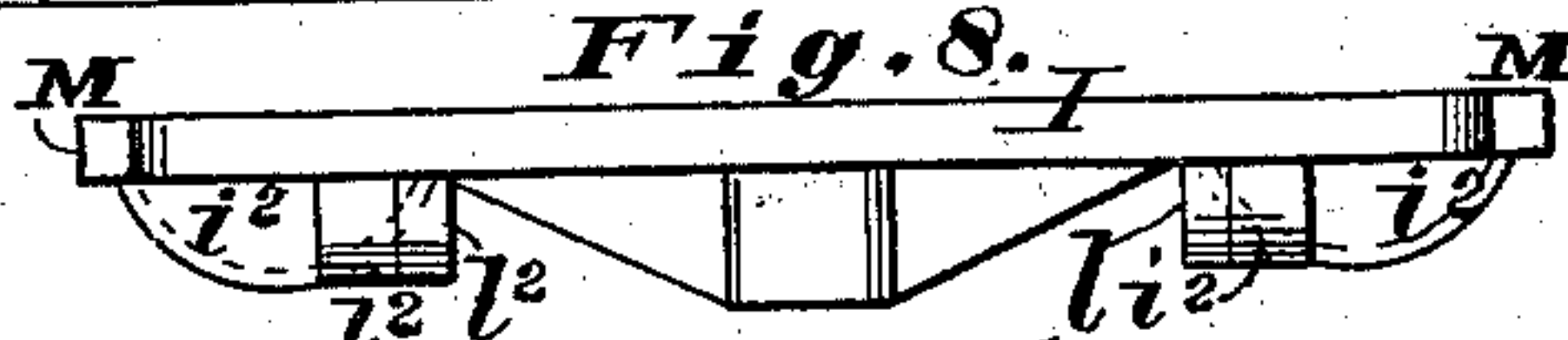


Fig. 9.



Fig. 11.



Fig. 10.



Fig. 12.



Inventor:

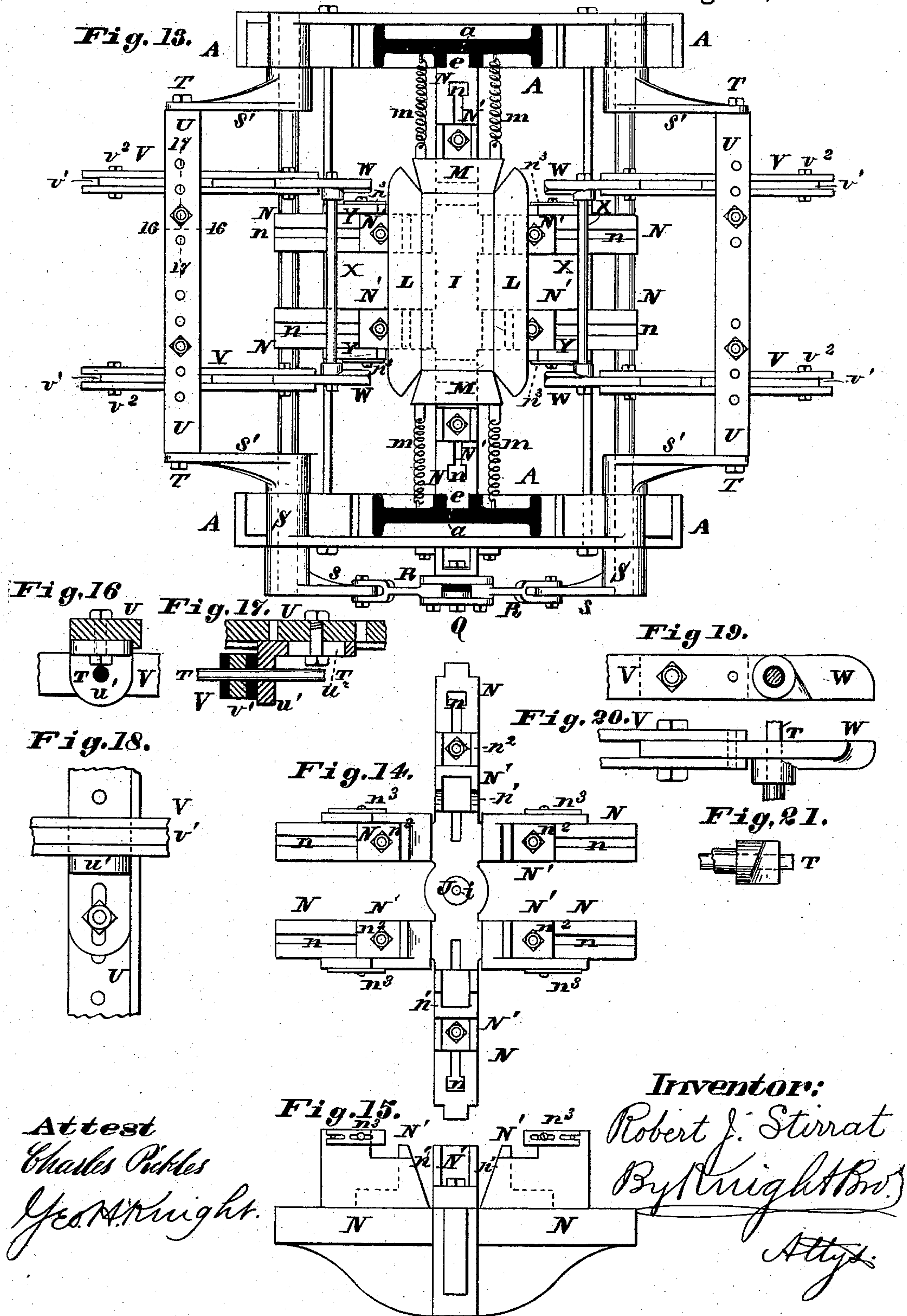
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Fig. 22.

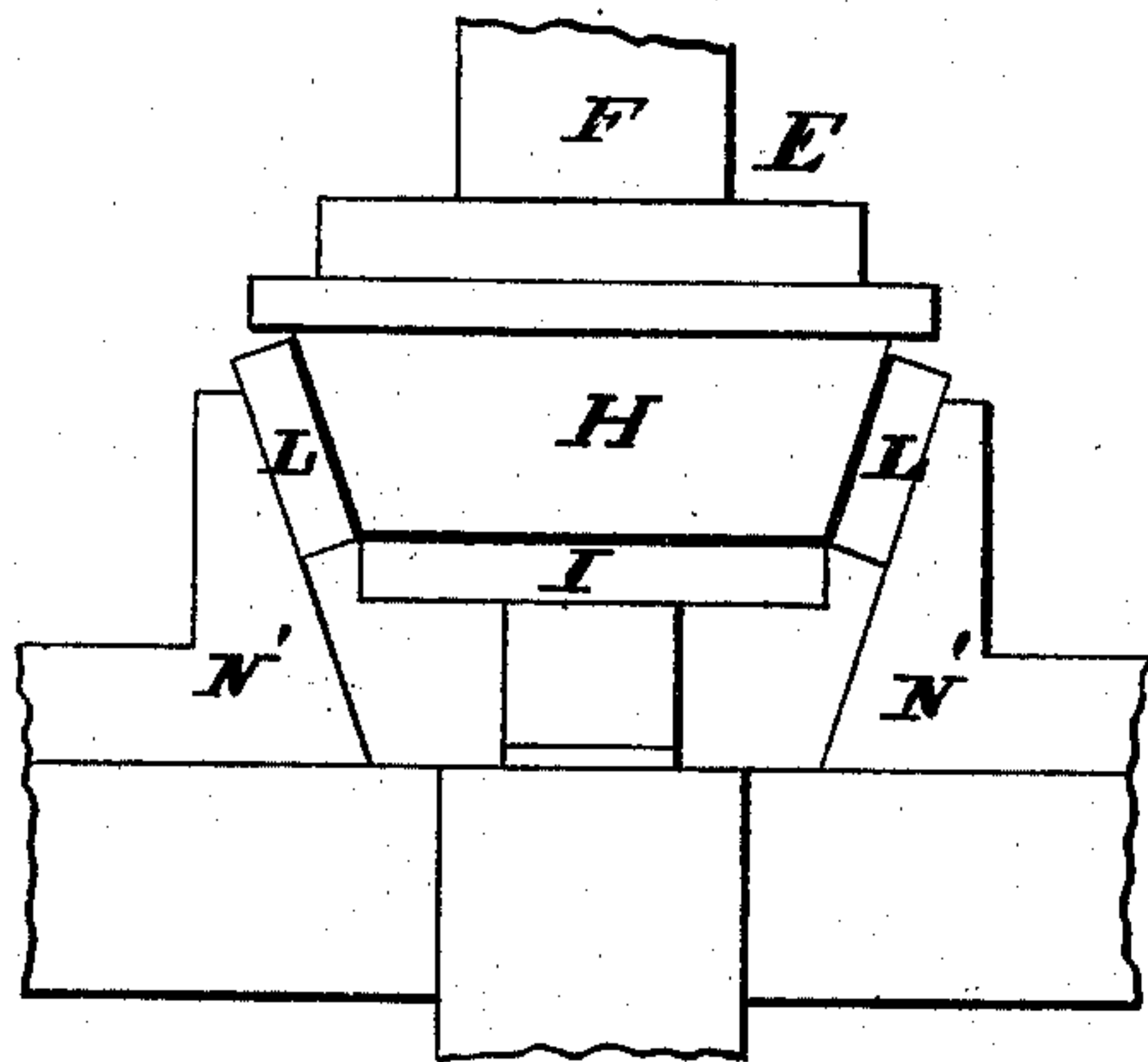


Fig. 23.

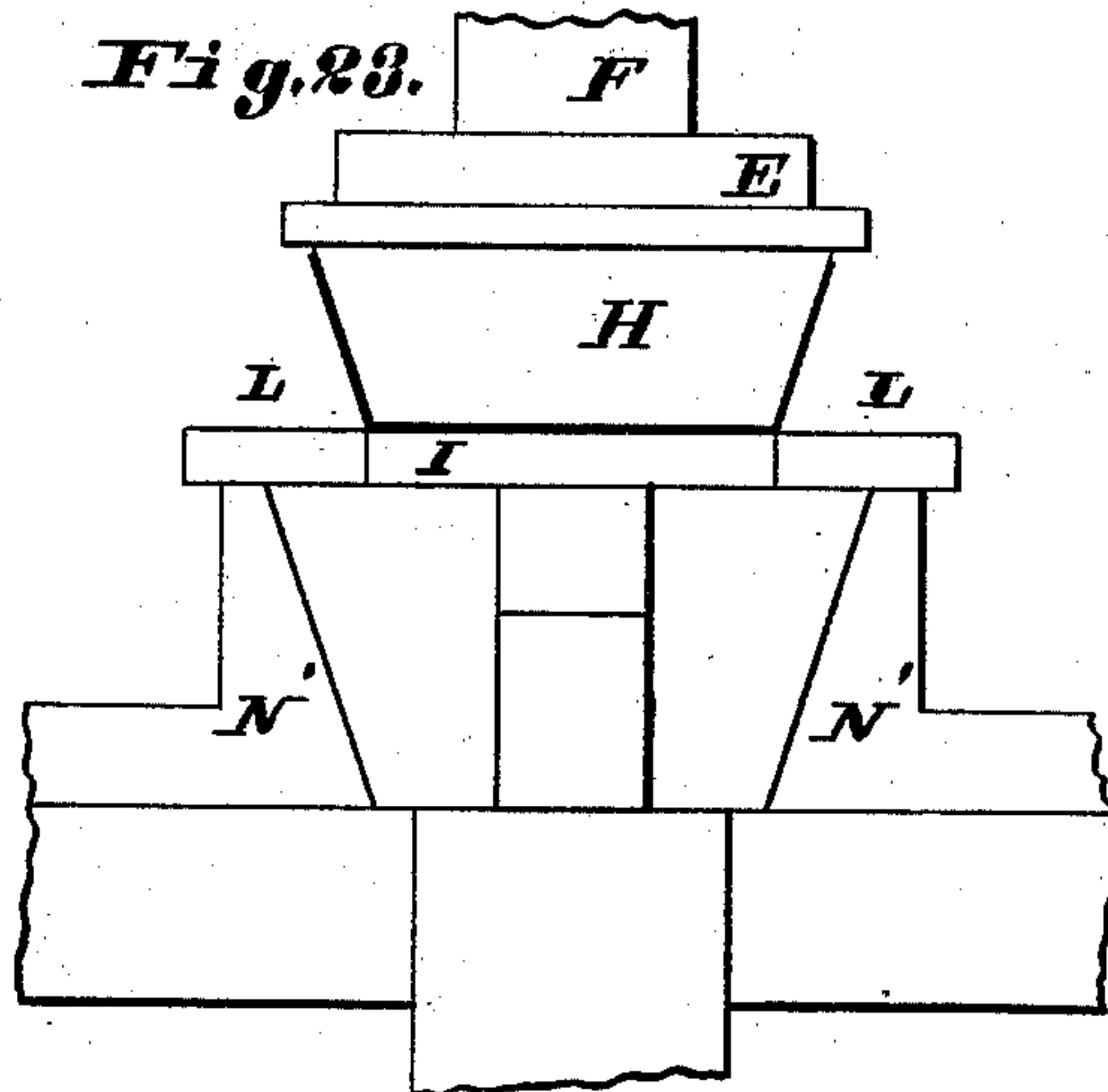


Fig. 24.

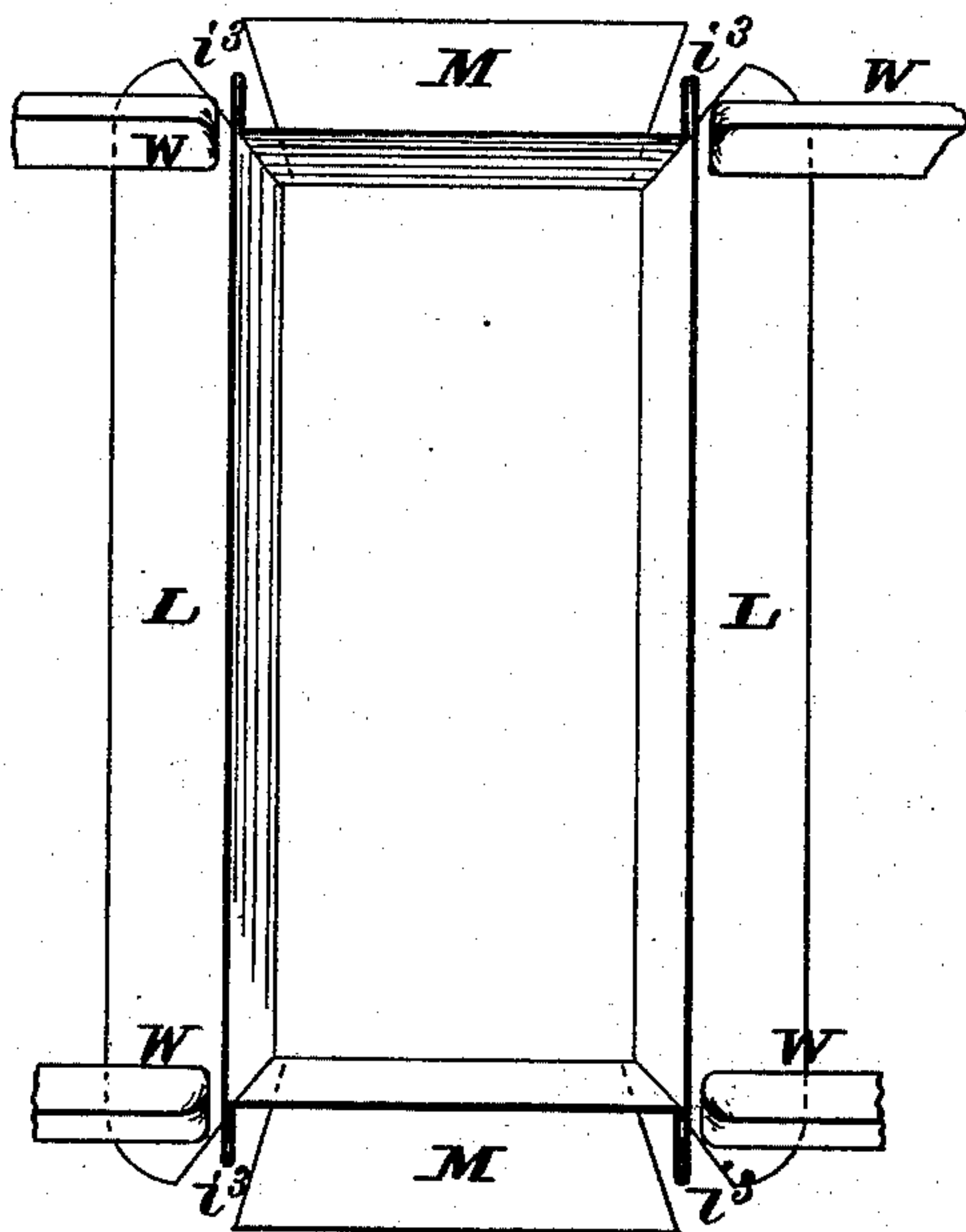
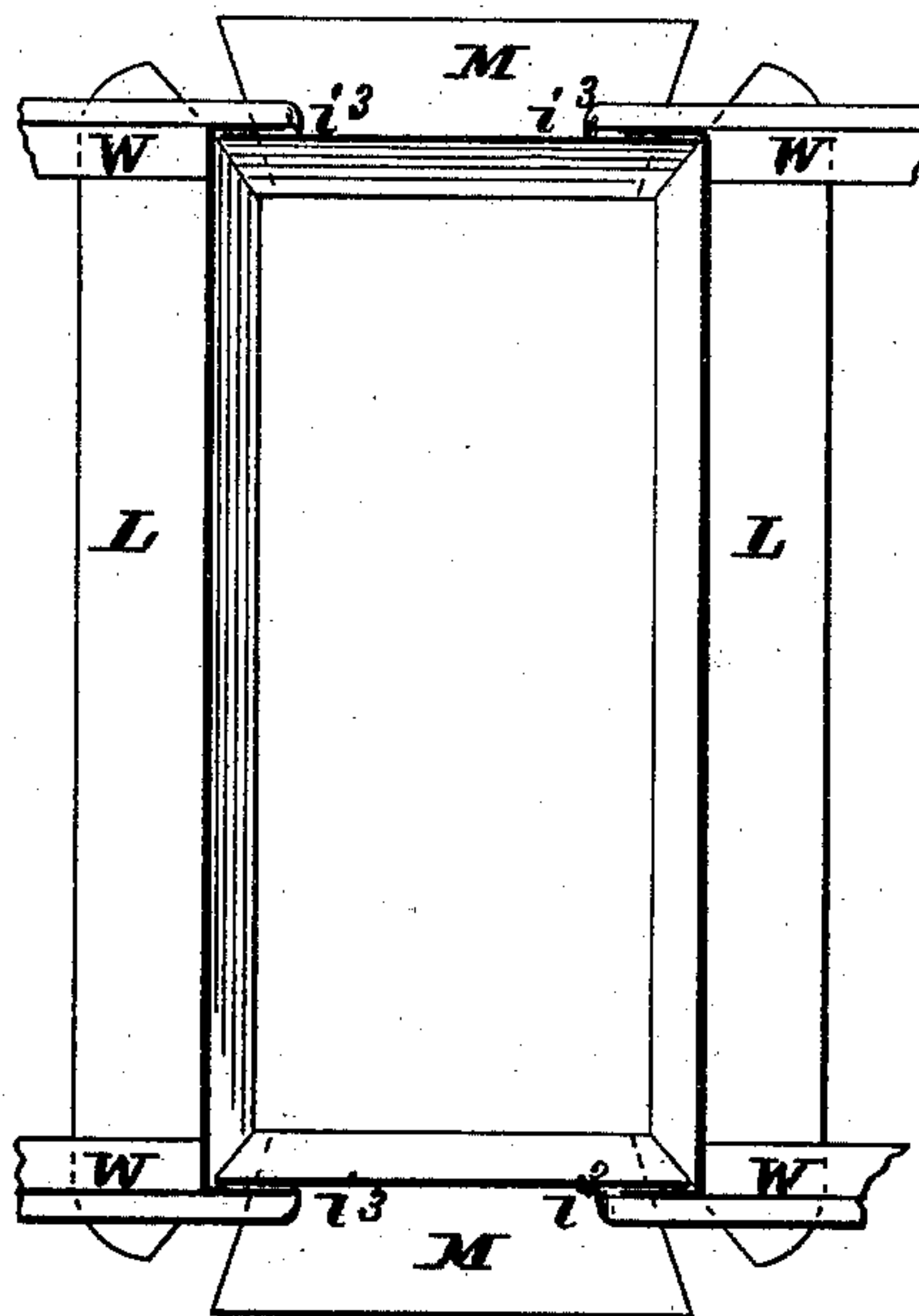


Fig. 25.



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UNITED STATES PATENT OFFICE.

ROBERT J. STIRRAT, OF ST. LOUIS, MISSOURI.

MACHINE FOR FORMING SHEET-METAL PANS.

SPECIFICATION forming part of Letters Patent No. 262,852, dated August 15, 1882.

Application filed February 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. STIRRAT, of the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Machines for Forming Sheet-Metal Pans, of which the following is a specification, reference being had to the accompanying drawings, forming part of the same.

Figure 1 is a front elevation of the machine. Fig. 2 is an end elevation of the machine. Fig. 3 is an enlarged detail of the vertically-moving head carrying the toggle-rods that actuate the corner-folding tools, and Fig. 4 is a side view of the same. Fig. 5 is a horizontal section at 5 5, Fig. 3. Fig. 6 is a section at 6 6, Fig. 1. Fig. 7 is a bottom view of the mold enlarged, and Fig. 8 is a side view of the same. Fig. 9 is a section at 9 9, Fig. 7. Fig. 10 is a section at same place, showing the position of the hinge when the folding-plate is thrown up. Fig. 11 is a section through the hinge at 11 11, Fig. 9. Fig. 12 is a section at 12 12, Fig. 7. Fig. 13 is a horizontal section at 13 13, Fig. 1. Fig. 14 is a top view of the frame or table supporting the adjustable cam-blocks, and Fig. 15 is a side view of same. Fig. 16 is a section at 16 16, Fig. 13, through the bar by which the corner-folders are operated, enlarged. Fig. 17 is a section at 17 17, Fig. 13, enlarged. Fig. 18 is a detail bottom view of the bar through which the corner-folders are operated. Fig. 19 is a side view of one of the corner-folding tools, and Fig. 20 is a top view of same. Fig. 21 is an end view of same. Fig. 22 is a diagram showing the die and mold in their lower position. Fig. 23 shows them in their upper position. Fig. 24 is a top view of the mold, showing the pan with the corners projecting in the line of the sides ready for folding along the ends. Fig. 25 is a similar view, except that the corners are folded.

A is the main frame of the machine.

B is a cam-shaft turning in the upper part of the frame A, and having upon it cam-wheels C C and D. The cams C operate the dies, and the cam D operates the corner-folding tools.

E is a head working vertically, being guided by lugs or tenons *e* at its end, that work in guide grooves or slots *a* of the main frame.

The cam-wheels C have cam-grooves *c* upon the side, which receive the cam-pins *e'*, extend-

ing from the ends of the head E. I prefer to arm the pins *e'* with friction-rollers. The head E has a central vertical socket, F, which receives the neck G of the die H. The neck is held in the socket by a set-screw, *g*. The construction allows the easy removal of the die and the substitution of another of a different size for use in making a different size of pan, for it will be understood that the die fits the inside of the pan.

The mold or female die has a flat plate, I, forming its central part and agreeing in area with the bottom of the pan; and, consequently, when the sheet-metal blank is laid on the mold and the die descends the plate is held tightly between the die and mold-plate I. The mold is supported upon a spring-rod, J, that rests upon a spring, K, the arrangement allowing the mold to be carried down with the die as the sides and ends of the pan are bent upward by the wings L and M, that are hinged to the edges of the plate I, and which are folded upward by cam-blocks. The mold is attached to the rod J by means of a neck, *i*, upon the bottom of the mold that rests in a socket of the rod J, and may be held therein by a set-screw, *i'*. This manner of attachment allows the easy removal of the mold and the substitution of another when a pan of a different size is to be made. The end wings, M, are connected to the plate I by hinges, consisting each of a lug, *l*, with curved bearing-face at bottom and fast upon the wing, said lug working in a bearing, *i²*, of the plate I. The bearing-face of the lug is in the arc of a circle whose center is at the meeting edges of the plate I and the hinged wings. Thus these edges of the wings and plate are unbroken by any projecting part at the point or line of contact, and present an even surface to the sheet metal. The joints of the side wings, L, are substantially similar to those described; but as each of these wings has two hinges the bearing-lugs *i²* may be upon only one side of the lugs *l*, as shown in Fig. 12, instead of being upon both sides of the lug *b*, as shown in Fig. 11. As the continued descent of the die carries down the mold with it the wings L and M are tilted up by posts N', having the inner side, *n'*, inclined similarly to the sides and ends of the pan. These posts are made adjustable in slots *n* in a table, N,

being held to the table by bolts n^2 , that pass through the slots and the posts. This adjustable feature of the posts N' is rendered necessary to enable the machine to work on pans of various sizes. As the die and mold or female die descend together, and the rings bend up the edges of the blank, the corners i^3 are thrown out in line with the sides, owing to the side wings being extended at the ends and giving that bent to the metal. (See Fig. 24.) The pan and mold remain at rest in this position a little while to allow the corners to be folded into the position shown in Fig. 25. To hold these parts in the fixed position I make the part of the cam-groove from c' to c^2 in the arc of a circle concentric with the axis of the cam, so that the cam turns without lifting the die until the pin e' reaches the point c^2 . As the die ascends the spring K lifts the mold, and the wings lie out flat upon the top of the posts N' , the die H continuing to ascend to allow the pan to be removed ready for wiring. n^3 are adjustable guides used to indicate the proper position of the blank when it is laid upon the mold.

I will now describe the machinery for folding the corners against the ends of the pan.

The cam D , upon the shaft B , has a cam-groove, d , that receives a pin, O , carrying preferably a friction-wheel, and connected by a pitman, P , to a toggle-block, Q , working between vertical guides a' of the main frame. The toggle-block is connected by rods R to the arms s of a rock-shaft, S , upon each side of the machine. Each rock-shaft has arms s' , through whose upper ends passes a pintle-rod, T , that extends through the downturned lugs u at the ends of a bar, U , extending from arm to arm. u' are brackets through which the rod T passes, said brackets being secured to the bar U by bolts passing through longitudinal slots u^2 in the bracket. The rod T also passes through slots v in the bars V , extending at right angles to the bar U and in contact

with the brackets u' . The rod T also passes through slots in blocks v' , which are interposed between the two parallel bars or members of which the bars V are composed. The blocks v' are secured in position in the bars V by bolts v^2 , passing through both the bar and the block. The construction is such that the block can be adjusted endwise in the bar to change the position of the bars upon the pintle-rod, and to consequently change the position of the tools W , by which the corners are folded to suit pans of varying width. The adjustment of the tools for pans of various lengths is had by moving the brackets u' on bar U .

The folding-tools are bolted to the inner ends of the bars V , and each pair is connected by a tie-bar, X , which rests and slides on guides Y . m are spiral springs, connecting lugs on the outer edges of the wings M to the main frame, and tending to draw such edges outward.

It will be observed that the part of the cam-groove d most distant from the shaft B is on the same side of the shaft B , or the same direction from the shaft, that the parts c' c^2 are. The cam-grooves c are located so that at the time the dies are at rest the tools W are in their most forward position.

I claim as my invention—

1. The combination of pan-forming dies, cams C C and D , pitman P , toggle-block and rod Q R , rock-shaft S with arms s and s' , and folding-tools V W , constructed to operate substantially as set forth.

2. The combination of shaft B , cam D , having groove d , pitman P , having pin O , toggle-block Q , guides a' a' , rods R , arms s s' s' , rock-shafts S S , pintle-rod T , bars U U and V , tools W W , and tool-guides Y Y , as set forth.

ROBERT J. STIRRAT.

Witnesses:

SAML. KNIGHT,
GEO. H. KNIGHT.