

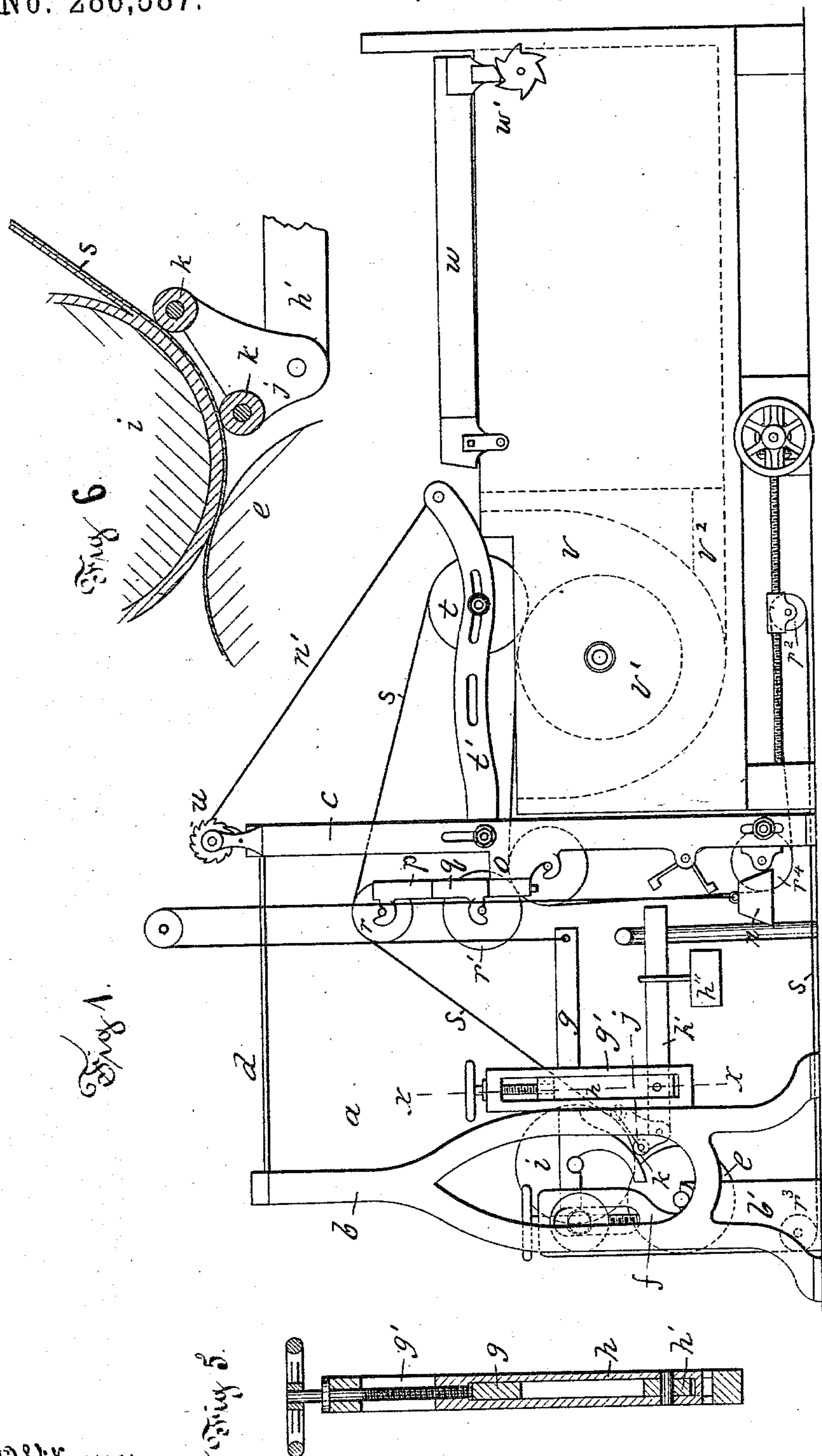
(No Model.)

3 Sheets—Sheet 1.

H. F. CASE.
PAPER MAKING MACHINE.

No. 286,587.

Patented Oct. 16, 1883.



Witnesses
Wm. J. Perkins
W. H. Marsh.

Inventor
Henry F. Case
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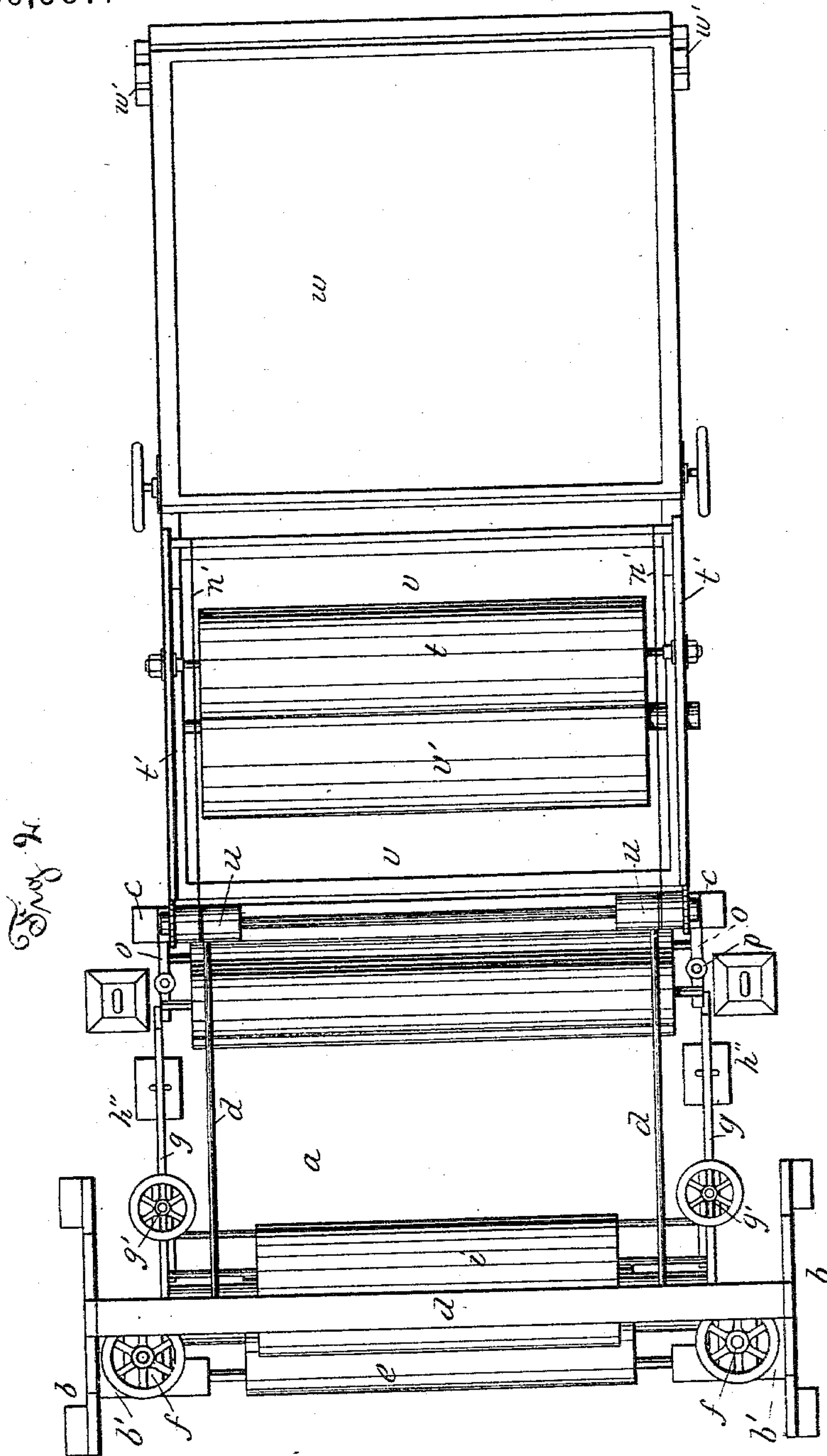
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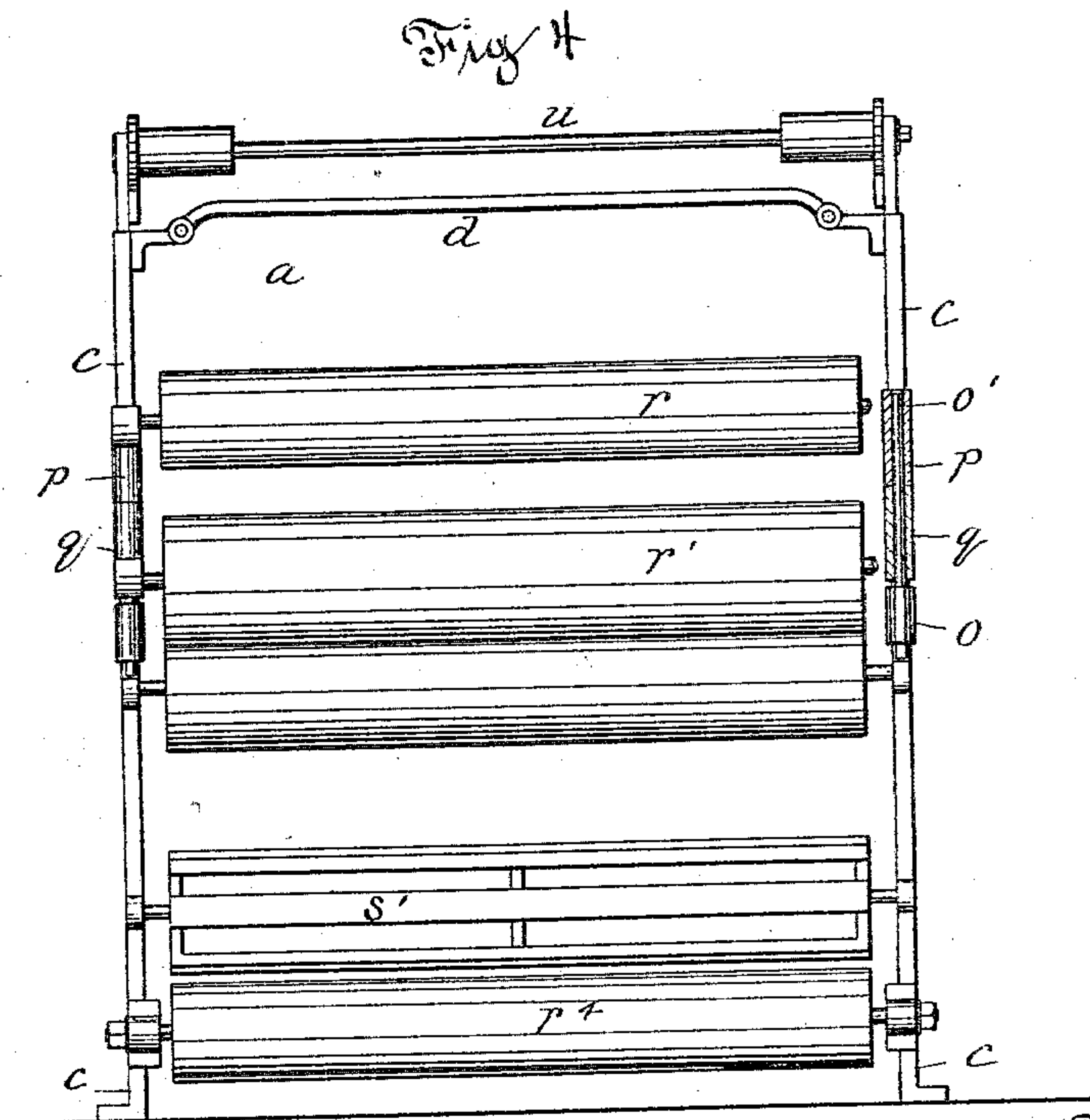
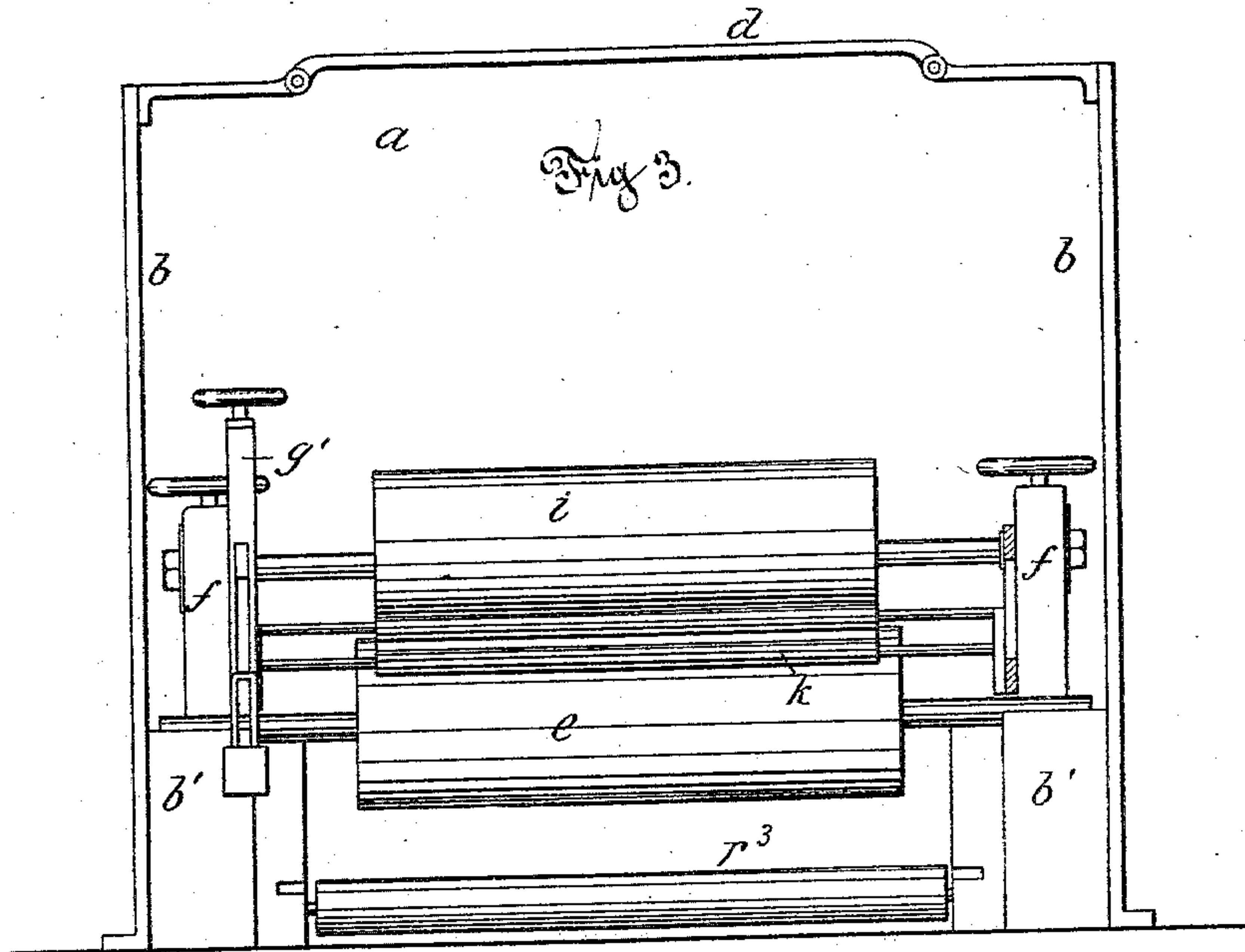
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UNITED STATES PATENT OFFICE.

HENRY F. CASE, OF SOUTH MANCHESTER, CONNECTICUT.

PAPER-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 286,587, dated October 16, 1883.

Application filed September 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. CASE, of South Manchester, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Paper-Making Machines, of which the following is a description, reference being had to the accompanying drawings, where—

Figure 1 is a side view of my improved device. Fig. 2 is a top view of the same. Fig. 3 is a rear view of the making-rolls, showing parts in section to show details of construction. Fig. 4 is a front view of the felt-rolls and felt squeeze-rolls, with parts in section. Fig. 5 is a view in section through the levers on line *x x* of Fig. 1. Fig. 6 is a detail view, on enlarged scale, of a part of the making-roll, felt, and auxiliary rolls, showing the method of adding the pulp to the material on the roll. My invention relates to the art of paper-making, more particularly to what are called "wet machines;" and it consists in improved methods of delivering the stuff or pulp to the screen; in the arrangement of the felt-stretcher; in the lateral arrangement of the making-rolls; in the use of auxiliary press-rolls for rewetting the outer layers of paper on the making-roll, and then removing the surplus water before the board is passed between the making-rolls; in the adjustable bearings of the felt squeeze-rolls, and in several other details more particularly hereinafter described.

In the accompanying drawings, the letter *a* denotes a frame; *b*, the front standards, and *c* the rear ones, secured at the top by ties and braces *d*, and having suitable feet for securing the whole to the floor.

Fast to each of the standards *b* is a suitable bearing, *b'*, for the bottom press-roll, *e*, and also upright stand *f*, in which a vertically-adjustable swinging lever, *g*, is pivoted. To this lever is secured the vertical cross-arm *g'*, near the lower end of which (in a block, *h*, that is vertically adjustable in the arm) is pivoted a lever, *h'*, to the forward end of which is pivoted a rocking bearing, *j*, for the auxiliary press-rolls *k*, arranged to bear upon the under side of the top press-rolls, *i*. As usually made, the axis of the top press-roll is vertically over that of the bottom press-roll; but I place the top roll, *i*, some distance to one side of

the vertical, so that it overhangs the bottom press-roll, *e*, for purposes that will be hereinafter explained. The weight of the swinging lever and connected parts upon the journals of the top press-roll is balanced by the counterpoise *n*, operating by means of a chain or cord over a pulley fast to any suitable point overhead, and the pressure of the auxiliary rolls *k* is adjusted by moving the weight upon the long arm of lever *h'*. A bracket, *o*, bearing an upright pin *o'*, is fast to the standard *c*, and the sleeves *p* and *q* fit upon this pin. Sleeve *p* has a bearing for the felt-roll *r*, and sleeve *q* one for the top felt squeeze-roll, *r'*, set in suitable bearings on the standard. Any pressure put upon the felt-roll, as by means of the felt *s*, is transferred to and exerted upon the wet felt as it passes between the squeeze-rolls. The coucher-roll *t* is journaled in the frame *t'*, pivoted to the standards *c*, and raised or lowered by means of the winch *u* and cords *u'*.

Below the coucher-roller is the semi-cylindrical vat *v*, in which is rotarily suspended the usual form of making-cylinder, *v'*.

Back of the making-vat *v*, and connected by the stuff-pipe *v''* with it, is the stuff-box bearing the tilting screen *w*, which is shaken in the usual manner by the cam mechanism *w'*.

The felt stretcher-roll *r''*, and the stretching mechanism of screw-rods, traveling bearings, and bevel-gears, are arranged in a space below the making-vat and stuff-box in a position that keeps the front of the machine free for the near approach of a truck, on which the workman deposits the moist sheets of board from the press or making-roll for ready transport to the drying-stack. The old form of wet machine has the stretching apparatus extending from the front of the machine.

The felt *s* passes in the usual course in an endless belt over the making-cylinder, from which it gathers a layer of pulp or stuff around the coucher *t*, over the felt-roll *r*; between the top press-roll and the auxiliary press-rolls and the lower press-roll, down to and around the roller *r'''*, the stretcher-roller *r''*, the roller *r''''*, up past the felt-washer *s'*, between the squeeze-rolls, to the making-cylinder and coucher-roll, constantly taking up a layer of pulp and depositing it upon the making-roll *i*.

The sleeve-bearings of the felt-roll and the

top squeeze-roll enable me to adjust the squeezing-pressure upon the felt as it passes between the squeeze-rolls by means of the felt-stretcher, as an increased tension upon the felt makes
5 an increased pressure upon the squeeze-rolls.

On the old machines it has been impossible to form a paper board beyond a certain thickness, less than was desired. The thickness of the board depends upon the number of layers
10 formed upon the making-roll, calling the length deposited by a single revolution of the roll a "layer." If layers beyond a certain number (depending on the quality of the pulp and thickness of the layer) were allowed to make on the
15 roll, the board wrinkled and blistered badly. This defect is caused by the dryness of the outside of the board as it meets the felt to receive the next layer after passing between the press-rolls. This surface is wet, but not enough
20 so to allow it to make a good union between the layers, which may be easily separated in the finished board.

By arranging the press-rolls so that the upper projects laterally over the lower, space is
25 gained for the auxiliary rolls that serve the double purpose of moistening the surface of the board on the top press-rolls, and then removing the surplus water before the board passes under the top press-roll and on the
30 lower. The water expressed from the felt and pulp by the slight pressure of the upper auxiliary roll gathers along its upper surface against the press-roll, and moistens the surface of the board to just the degree necessary
35 to form a perfect union between the board and the new layers of pulp, which are partially formed and dried by the lower auxiliary roll, and then pressed into a homogeneous mass be-

tween the press-rolls. This operation may be continued until a board of any desired thickness is made, and this board, unlike that thinner one formed on the old machine, cannot be separated into layers.

I claim as my invention—

1. In a paper-making machine, the method
45 of remoistening the surface of binder's board or the like after it has passed between the press-rolls and previous to the reception of a new layer of pulp, whereby a homogeneous board is formed, all substantially as described. 50

2. In a paper-making machine, in combination, a top press-roll overhanging the lower press-roll laterally, all substantially as described, and for the purpose set forth.

3. In combination, a press-roll, *e*, top press-roll, *i*, and auxiliary rolls *k*, all substantially
55 as described.

4. In combination, bottom press-roll, *e*, top press-roll, *i*, and adjustable lever *g*, having arm *g'*, bearing lever *h'* with weight and counter-
60 poise, whereby the pressure between the rolls is adjusted, all substantially as described.

5. In combination, top roll, *i*, lever *g*, having arm *g'*, lever *h'*, rocking bearing *j*, and
65 auxiliary rolls *k*, all substantially as described.

6. In combination, frame *a*, felt *s*, felt-roll, squeeze-rolls *r*, and sleeve-bearings *p q*, all substantially as described.

7. In combination, frame *a*, coucher-frame *t*, winch *u*, and cords *v'*, all substantially as
70 described.

HENRY F. CASE.

Witnesses:

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