

No. 874,946.

PATENTED DEC. 31, 1907

C. EICHORN & C. W. CAMPBELL.

PAPER MAKING MACHINE.

APPLICATION FILED MAY 4, 1905.

3 SHEETS—SHEET 1.

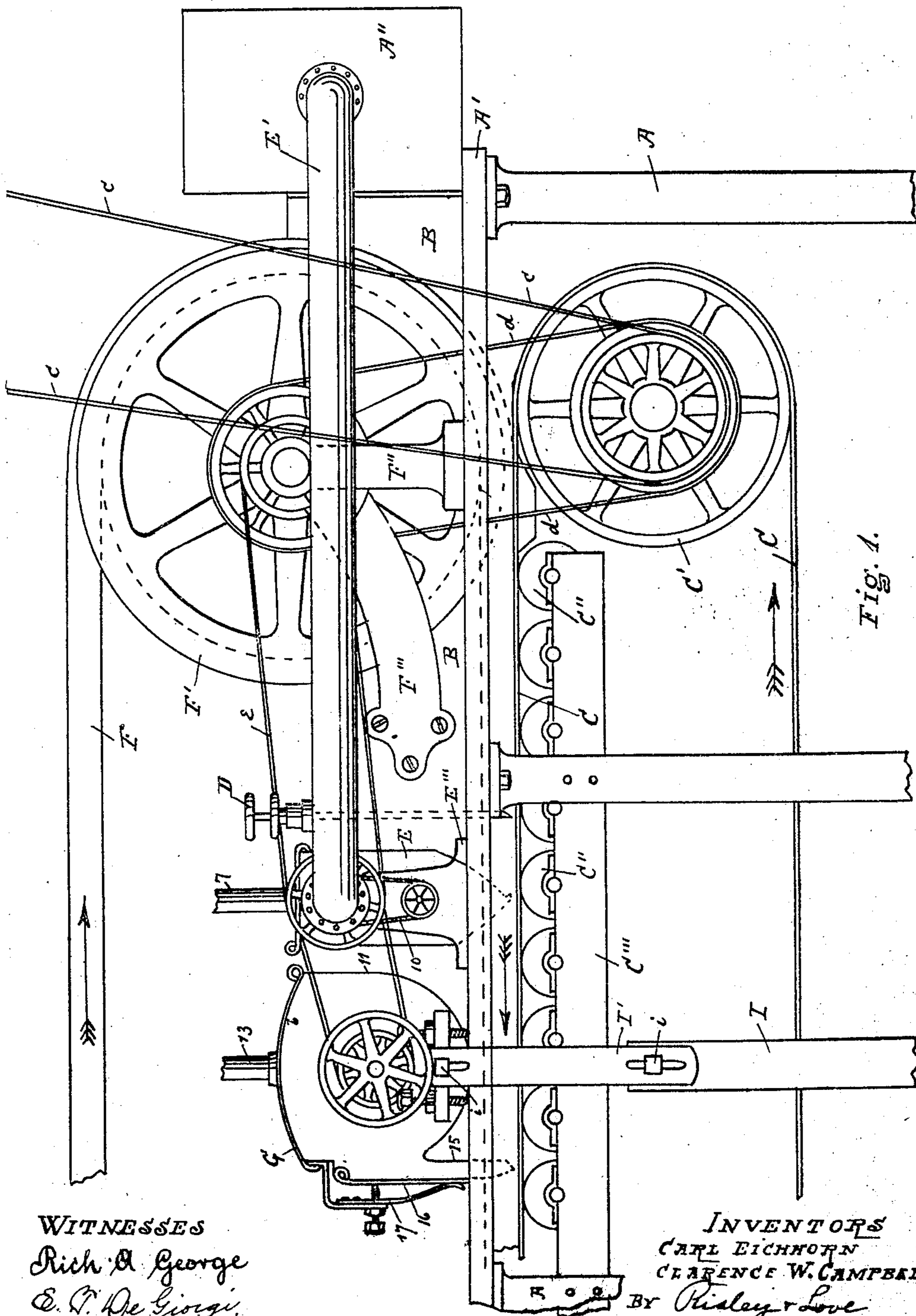


Fig. 1.

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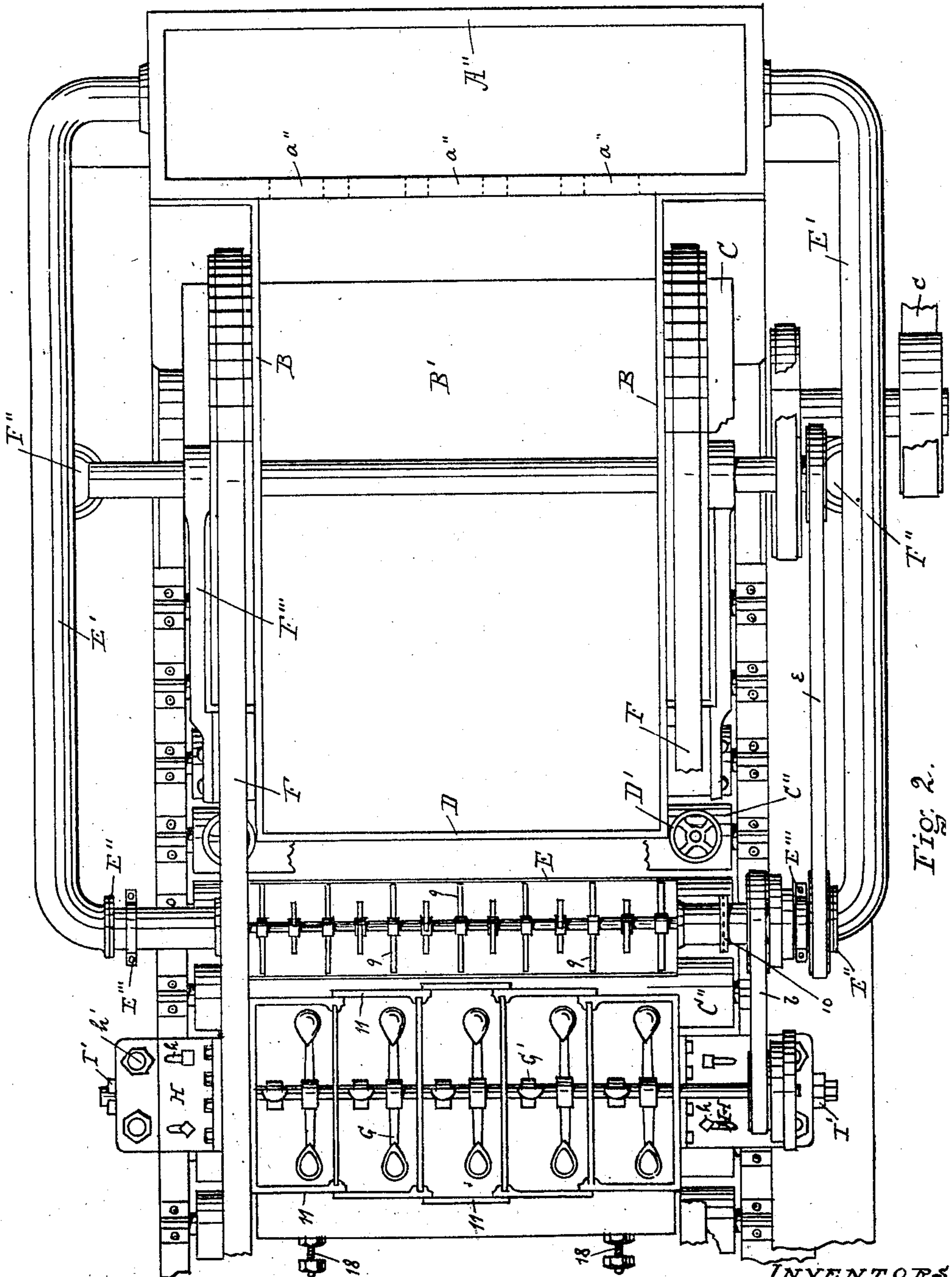
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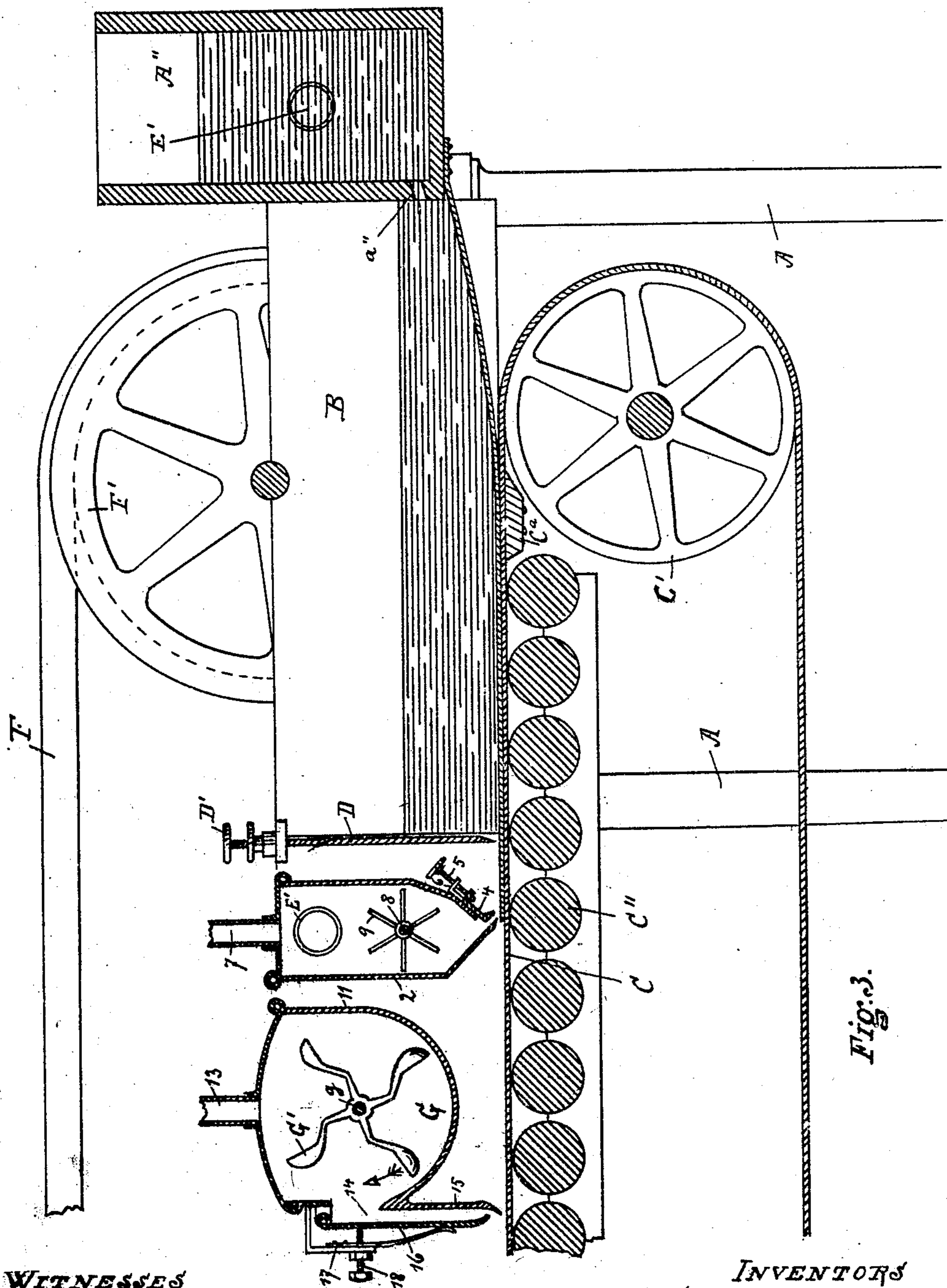
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# PAPER MAKING MACHINE.

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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

CARL EICHHORN AND CLARENCE W. CAMPBELL, OF DEXTER, NEW YORK, ASSIGNORS TO  
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## PAPER-MAKING MACHINE.

No. 874,946.

Specification of Letters Patent.

Patented Dec. 31, 1907.

Application filed May 4, 1905. Serial No. 258,863.

*To all whom it may concern:*

Be it known that CARL EICHHORN, a citizen of Nimwegen, Holland, and CLARENCE W. CAMPBELL, a citizen of the United States, each residing at Dexter, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Paper-Making Machines and Processes of Making Paper, of which the following is a specification, reference being had therein to the accompanying drawing.

Our invention relates to an improved paper making machine and process of making paper and we do declare that the following is a full, clear, concise and exact description thereof, sufficient to enable one skilled in the art to make and use the same, reference being had to the accompanying drawings in which like letters and numerals refer to like parts throughout.

In the drawings we illustrate our invention of a machine in a single application thereof, without limiting ourselves to the details and particulars shown by the use of which the method invented is to be practiced.

Our invention is applicable particularly to a machine which comprises a screen onto which the stock is fed through suitable openings, and in the operation of which machine the water is passed off and the paper stock is retained.

The purpose of our invention is to make a more perfect weaving of the fibers which make up the paper, and to regulate the feed of the paper stock to the machine, to control its weight, evenness, appearance etc., and to provide for different feeds to accomplish such results.

It will be apparent from the description of our device that a multitude of effects can be obtained, as for instance, producing a sheet of different distinct color on each side. We also show how different coloring materials or fluids can be admitted at proper places, and means by which the feed of the paper stock or other materials or fluids can be put under pressure.

Other features of our device will be apparent to those familiar with the art, together with various modifications of our device and modified uses of the same, which we do not attempt to state in full.

In the drawings Figure 1 is a side view of a well known machine, showing our invention

applied thereto; Fig. 2 is a plan view of the same with the cover of the feed boxes removed, and Fig. 3 is a longitudinal sectional view.

As stated, our device is applied to a machine of familiar construction which is mounted on a solid base—not shown, but which supports the standards A on which rests the bed of the machine A'. On the bed of the machine is supported at one end the flow box A'', which outlets into the sluice formed with the sides B secured to the flow boxes A''. The bottom of the sluiceway is formed of a flexible apron indicated by B'', but not fully shown, one end being secured to the flow box A'' and the other resting on the endless screen C which is carried on the drum or breast roll C' (there being a suitable support at the other end), which drum or roll is carried by pulley c to pass the screen in the direction indicated by the arrow in Fig. 1. The screen passes on the rolls C'' which extends from one side of the machine to the other and are supported in journals on the bar C''' mounted on the standards.

At the end of the sluiceway is gate D which bears on the end of each side piece B, but which is screw mounted to slide up and down by means of the wheels D' whereby the feed of the paper stock onto the screen may be regulated. Of course, it will be understood that the paper stock is let into the flow box A'' whence it passes onto the apron under the gate onto the screen.

Across the screen we mount a secondary feed or flow box E. From the flow box A'' to the flow box E extend feed pipes E' through which the stock is fed from the former to the latter, the pipes being connected to the box E at its ends. At the end near the box E each pipe is provided with a stuffing box E'' so that the flow box E can be swung on the pipes and held in a given position. Each pipe section which is connected to the flow box E has an independent support E''' on the bed-plate A'. Other suitable means may be employed for holding the flow box E in a given position on its pivotal mounting, but such means, if not formed as a part of the stuffing box, can be devised and applied by any mechanic. The lower part of this feed box E is shown in section in Fig. 3; it has a tight fitting top 1 and side pieces 2 and 3 which after extending downwardly a

suitable distance turn toward each other, as clearly indicated in that figure. It will be seen that the side 2 projects downwardly nearly to the screen, and the side 3 if extended would meet the surface of the side 2. A longitudinal opening, the length of the box, is provided which normally thrusts the pulp material outwardly from the box in a direction opposite to that in which the screen is traveling. It is well known that the paper stock contains a large number of very minute fibers which naturally in the revolution of the screen take a certain direction, and when the manufacture of the paper is finished the fact that these fibers are substantially parallel to each other causes a weakness of the paper under strain across the line of the fibers. A prime purpose of the method shown in the invention and of the means by which we practice it is to cure this, which we accomplish by forcing a secondary feed from the box E onto the screen against the direction in which the fibers lie and are traveling, the result of which upsets their regularity and disperses them at angles, or bends them so that they naturally cross and weave into each other and engage each other, whereby the paper is made of greater strength. It will be apparent also that by means of this feed box and its adjustment in various ways we can regulate the force and direction of this secondary feed, and can add greater or less material at any part and equalize the weight. By this means also, we can add more water, if need be, to the pulp, or add more pulp, it depending on the material that is fed into the box E.

In order to regulate the direction of the feed, the box is swung on its bearings and held in the desired position. In order to regulate the amount of the feed, we provide along the edge 3 a sliding strip 4 which is engaged by the screwthreaded stems 5 which passes through lugs 6, and by the adjustment of which screw-thread the width of the opening between the sides 2 and 3 can be regulated. We have spoken of pressure being applied to this feed, and we indicate at 7 a pipe for such a purpose, which may be used to transmit atmospheric, steam or other pressure to the contents of the flow box. The pressure applied to the contents of the feeds, as through pipes 7 and 13, is distinct from the pressure consequent on the fall of material from the source of supply, and by the term pressure we refer to such artificial force as distinct from the natural fall. We also provide in the flow box a shaft 8, with beaters 9 thereon, and which is revolved by means of sprocket chain 10, or otherwise suitably, as will be indicated later on.

At the point where the box E is located the fluid is held onto the screen by the well known deckle straps F which pass over the drum or wheels F', the lower band resting on the

screen adjacent to its edges and traveling with it. The deckle drum, or wheels, is supported on standard F'', from which extends arms 8' to support the sides B of the sluiceway.

We provide further the feed G which may be used as here indicated to feed powdered coloring material, or which can be used for dispersing of coloring or other fluids onto the stock as it passes thereunder, and which, therefore, cooperates with the feed box E to produce the desired combination of effects by means of liquid or other substances, according to the product which is desired, and may be fed in a similar way. It has the body 11 and the close fitting top 12 with opening 13 whereby pressure can be applied to the contents. The body 11 curves downward and up onto the other side, but is provided with a longitudinal opening 14 from which depends a wall member 15 nearly to the surface of the screen. Opposite this wall member is pivoted a wall member 16 and spring 17 is mounted to bear against the wall and hold it in place, but the play of which may be regulated by screw member 18. Within this compartment G is a shaft 9 with spoon arms shown as G'' which may be revolved in either direction to drive the contents against the wall 16, whence it drops downward between the walls and is fed onto the paper stock according to the revolution of the spoons and the size of the opening and the disposition of the box G. This box is supported in two ways. To it we secure the brackets H which are in two members overlapping and provided with thumb-screw in slots whereby the ends of the box G can be moved in or out, the sides being formed of overlapping members adapted to slide on each other so that the box can be telescoped longitudinally. Through the brackets H are screw-bolts h', by the adjustment of which the box can be turned axially. With this mounting the box partakes of the vibration of the machines, but we desire at times to have it fixed so as not to take any of the vibration, and for that purpose we provide such a device as is shown by the standard I which is fixed to the solid base of the machine and which has connected thereto the arm I' by bolt i fastened through a slot in I'' so that the box G can be raised or lowered, or turned in a given direction. At the upper end of the bar I' we have bolt i' passing through a slot in I' so that the standards I and I' can be freed from close engagement with the brackets H, or the bolts h' can be raised to throw the entire weight onto the bars I and I'. Box E can be mounted also, in this way.

Power is applied to the device, for instance, through pulley c which turns the breast roll C'. The power is transmitted by the belt D to a pulley on the deckle roll shaft from whence it passes through the bolts e

and *f* to the flow box *E* and the box *G* respectively by pulleys or a series of pulleys by which the rate of speed may be suitably fixed or altered.

5 In short we have produced a paper making machine and method of paper making, in which the product is affected by means of a secondary feed in a given direction, and with a given force natural or under pressure, by  
10 which stock or water can be added to the stock on the screen to accomplish the purpose which we have indicated in a general way without limitation, and a further feeding device for contributing paper stock or  
15 coloring material or other substance under pressure or otherwise and in a chosen direction to further modify the construction and appearance of the product of the machine.

We have merely indicated one application  
20 of our invention but do not attempt to specify all possible uses of the same which will be apparent to one skilled in the art.

Having described our invention, what we claim as new and desire to secure by Letters  
25 Patent, is,

1. In a device of the character described comprising a feed box, a means of carrying stock therefrom through a paper machine, a feed box transverse the screen of said machine and having a longitudinal outlet at the  
30 bottom thereof and being pivotally mounted to adjust the angle of discharge therefrom onto the screen and conduit means for supplying said feed, substantially as described.

2. In a device of the character described comprising a feed box and a screen adapted to carry paper stock therefrom, through the paper making machinery, a plurality of independent feed boxes, pivotally mounted  
40 and extending substantially transverse the screen and means for applying pressure to the contents of the said feed boxes, substantially as described.

3. In a device of the character described, a  
45 plurality of feed boxes located substantially transverse the screen, each pivotally mounted and each provided with a close cover and each being adapted to receive pressure therein to drive the contents thereof onto the  
50 stock passing beneath the boxes, substantially as described.

4. In a paper making machine, having as an element thereof means for carrying paper stock through the machine, a feed box  
55 mounted substantially transverse of the screen, having its sides converging at the bottom into a longitudinal opening facing against the travel of the stock carrying means, means for limiting the extent of said  
60 opening, and means for altering the direction of the fluid discharged therefrom, substantially as shown.

5. In a device of the character described, a transverse feed; conduits for supplying stock  
65 thereto, means for ejecting the stock there-

from under pressure, and means for governing the direction and extent of the discharge of stock therefrom, substantially as shown.

6. In a device of the character described, a feed box mounted substantially across the  
70 screen, and constructed of compartments telescopically connected and having a shaft running therethrough with spoon members thereon, whereby different colored material can be ejected from the several compart-  
75 ments to the stock passing thereunder, substantially as described.

7. In a device of the character described, a feed box mounted substantially across the screen and constructed of compartments and  
80 being longitudinally extensible and having a shaft running therethrough with spoon members thereon, the said box having means whereby it may be supported on the machine frame, the said means being detachable  
85 whereby the box may rest upon supports on the substructure, substantially as described.

8. In a paper making machine, a feed box axially mounted and having an outlet lengthwise thereof with an adjustable clo-  
90 sure member for said outlet.

9. In a paper making machine, a feed comprising a box pivotally axially mounted and a secondary feed pivotally axially mounted, the said feeds having discharge outlets open-  
95 ing in opposite directions.

10. In a paper making machine, a primary feed, secondary means for feeding stock in currents of different directions to the primary feed said secondary feed being exten-  
100 sible longitudinally and the outlets having closure means.

11. In a paper making machine having stock feeding means therewith, secondary feeds axially and adjustably mounted trans-  
105 verse the machine and adapted to control the direction of the current, and having means to regulate the volume and the pressure of the currents from said feeds.

12. In a paper making machine, a plural-  
110 ity of means for feeding material under pressure with means for regulating the outflow of such feeds and the direction of such outflow.

13. In a paper making machine, a plurality of means for feeding stock being mounted  
115 axially and having outlets at the bottom with adjustable closure means for the said outlets.

14. In a paper making machine, feeding means axially mounted in journals and  
120 standards supporting the journals and independent of the frame, and means connected with the journals adjustable to shift the weight of the feeding means from the standards to the frame.

15. In a paper making machine, a plurality of receptacles in a feed box adjustable to the width to be given to the manufactured  
125 product.

16. In a paper making machine, secondary 130

means for feeding material, and means for adjusting the direction and force of the current from said secondary means.

17. In a paper making machine, a feed box 5 mounted substantially across the screen and constructed of compartments and being longitudinally extensible, and having means for placing the contents under pressure.

18. In a paper making machine, means for 10 feeding material thereto, the said means consisting of telescopic sections and being adjustable to the width of the fabric being manufactured in the machine.

19. In a paper making machine having a 15 primary feed, a secondary feed mounted adjacent the primary feed to discharge material under pressure against the current of the primary feed, means connecting the feeds, and means for agitating the contents of the secondary feed.

20. In a paper making machine, means for

feeding material to the stock being manufactured, the said means being adapted to be supported independent of the machine.

21. In a paper making machine, a primary 25 feed, a secondary feed adjacent the primary feed adapted to discharge its contents against the current of the primary feed, and means in the secondary feed to agitate the contents thereof.

22. In a paper making machine having 30 a primary feed, secondary feeds mounted to discharge material under pressure and against the current of the primary feed.

In testimony whereof we affix our signatures in presence of two witnesses. 35

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CLARENCE W. CAMPBELL.

Witnesses:

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