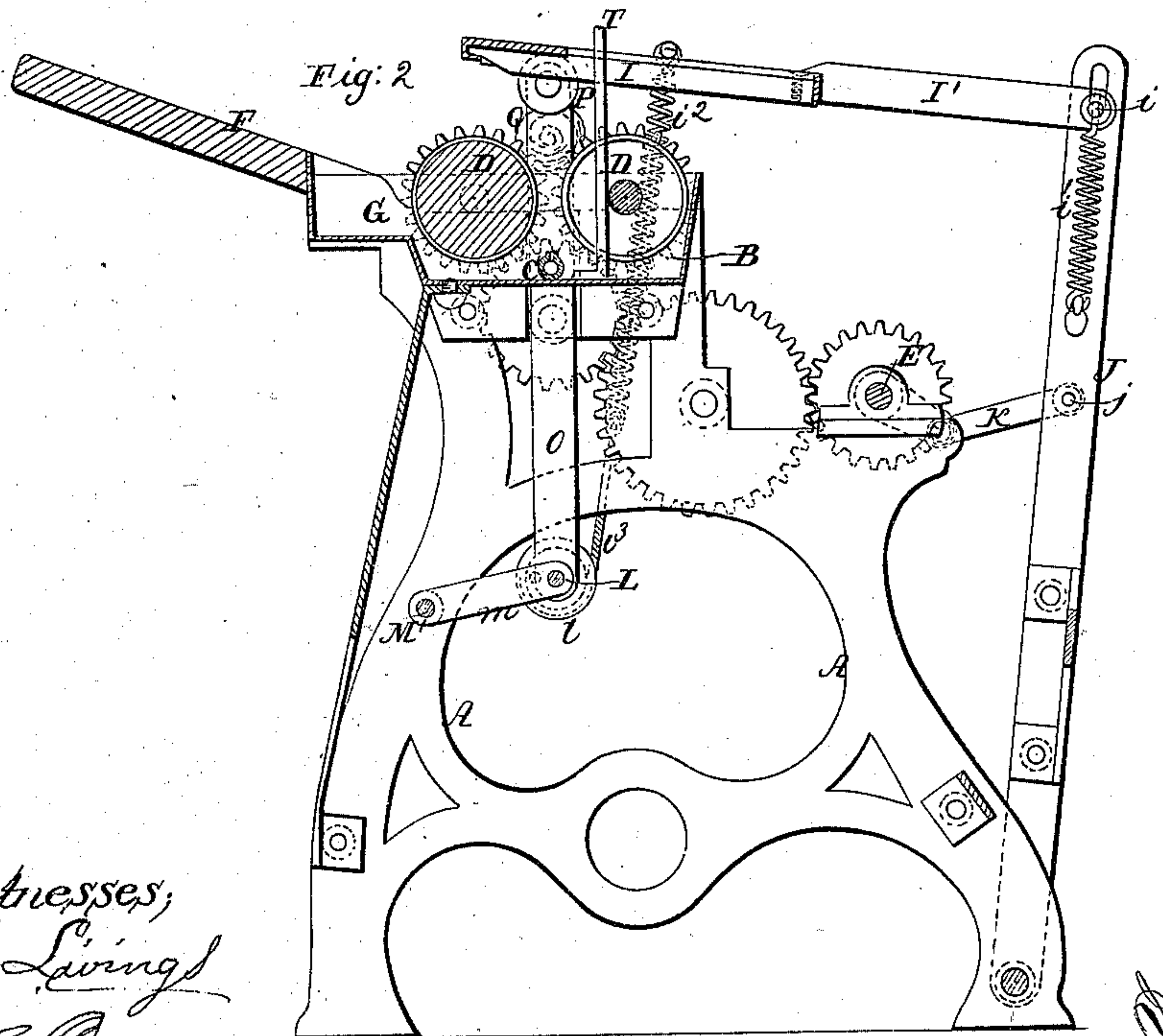
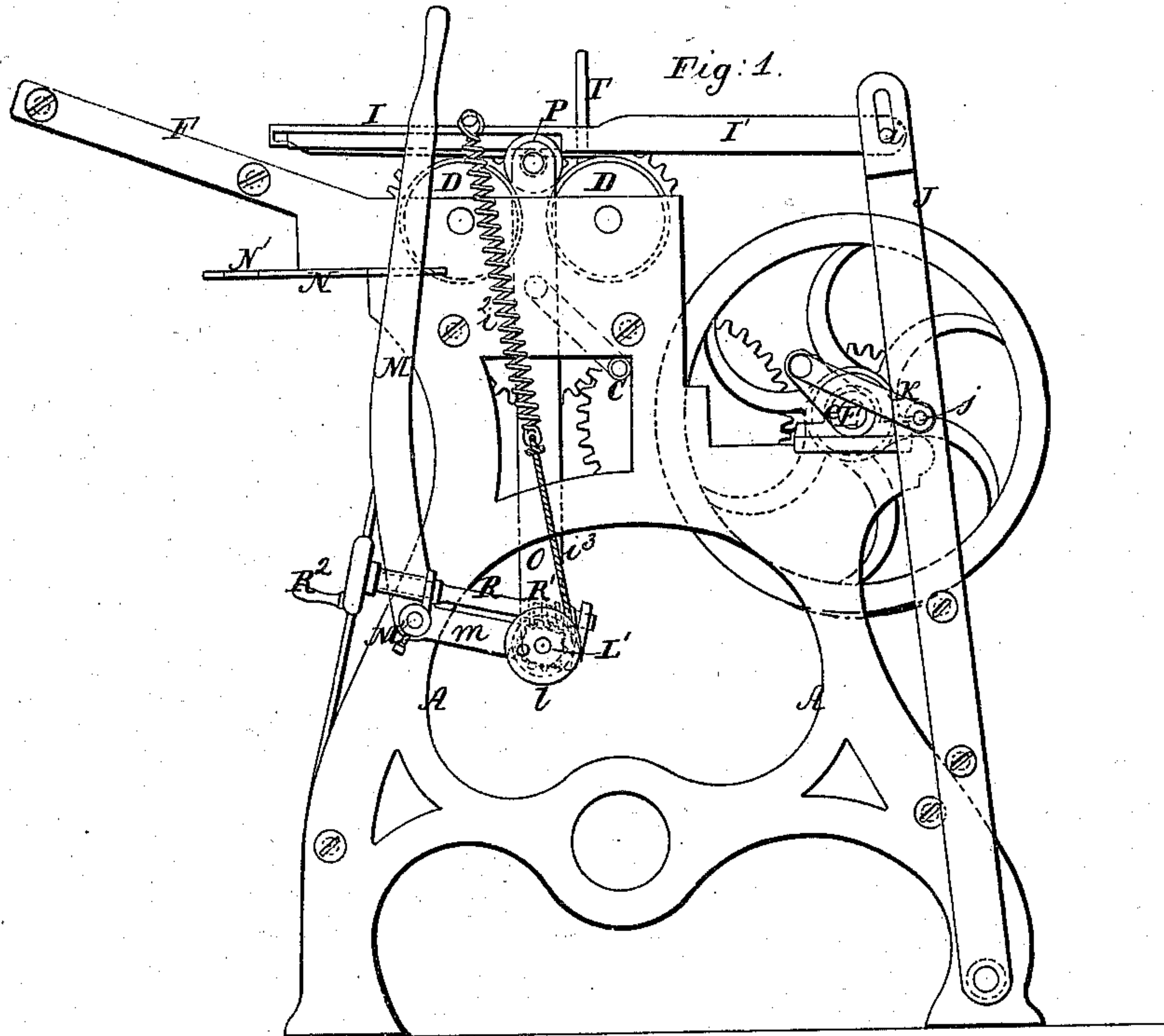


J. W. Blackham. Sheet 1, 2 Sheets.

Felting Mach.

N^o 94,939.

Patented Sept. 21, 1869.



Witnesses;
L. L. Livings
W. E. Dyer

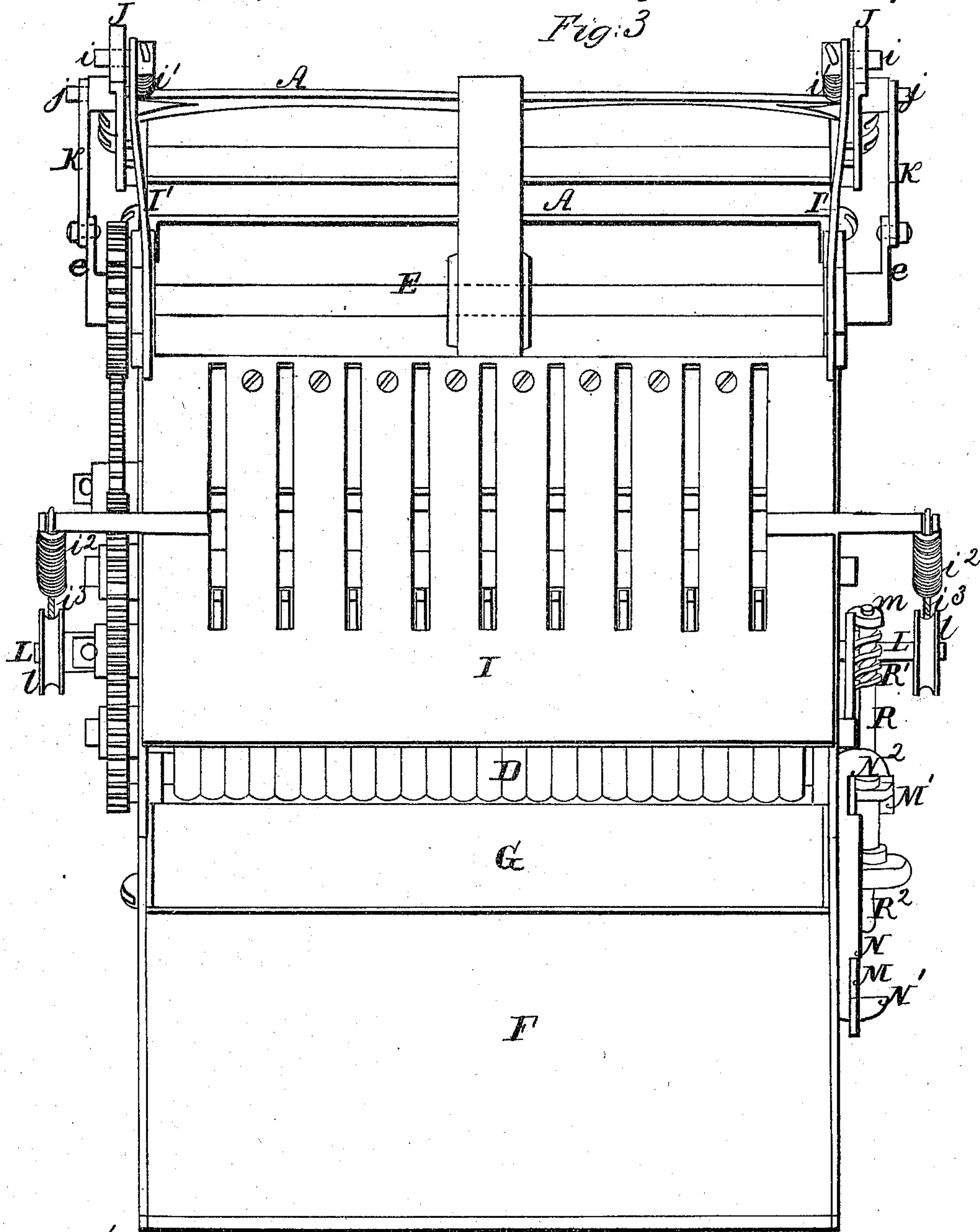
Inventor;
J. W. Blackham
by his atty. J. S. [unclear]

J. W. Blackham. Sheet 2, 2 Sheets.

Felting Mach.

Nº 94,939. Patented Sept. 21, 1869.

Fig. 3



Witnesses;
C. C. Livingst
W. C. By

Inventor;
J. W. Blackham
by his attorney, J. S. Eaton

United States Patent Office.

JOB W. BLACKHAM, OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF AND JAMES H. PRENTICE, OF SAME PLACE.

Letters Patent No. 94,939, dated September 21, 1869.

IMPROVEMENT IN FELTING-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JOB W. BLACKHAM, of Brooklyn, in the county of Kings, and State of New York, have invented certain new and useful Improvements in Machines for Felting Hats; and I do hereby declare that the following is a full and exact description thereof.

I will first describe what I consider the best means of carrying out my invention, and will afterwards designate the points which I believe to be new therein.

The accompanying drawings form a part of this specification.

Figure 1 is a side elevation of my machine, with the presser down at work;

Figure 2 is a vertical section, with the presser up, ready to receive hats or allow their removal; and

Figure 3 is a plan view, showing the machine in the latter condition.

Similar letters of reference indicate like parts in all the figures.

A A is a frame of cast-iron, made in sections bolted firmly together.

B is a tank adapted to contain water; and

O O are steam-pipes, receiving steam from a boiler not represented, and discharging it through small orifices in the upper sides of the pipes. The steam being discharged below the surface of the water, heats the water, and maintains it at a temperature at or near the boiling point. It furthermore throws up the water in small jets, and thus wets and heats the hats which are above the water.

D D are rollers, mounted in fixed bearings, and driven by gearing, so that both turn in the same direction. Power is received through a belt, or other suitable means, from a steam-engine or other motor not represented.

I prefer to apply the power to the shaft E, and to communicate the motion to the rolls D D through the gearing represented, but this is not absolutely essential to success. It is sufficient that the proper rotary motion is imparted to the rolls D D, and also to the shaft E, the purpose of which latter will presently appear.

F is an inclined table, on which the hats may be handled and rolled and unrolled, as in the ordinary manner, by hand.

G is a dipping-trough, represented as separated, or partially separated, from the tank B, but there is no necessity for any separation. I propose, in future machines, to make the tanks B and G in one, so that the heating of the water in the one will maintain the temperature in the other.

The hats, when properly rolled in the cloth, or otherwise prepared to be subjected to the felting-operation, are laid in the trough-like space between the two rolls D D, as indicated by Q. The motion of the roll-

ers tends to induce a constant tumbling or turning of the roll of hats.

I is a reciprocating-frame or presser, made preferably of iron, faced on the under side with hard wood.

It is reciprocated by means of levers J J, which are pivoted at j, and which receive motion from cranks e e on the shaft E, through the medium of the links K. As the shaft E revolves, it compels a vibrating motion of the levers J, and these communicate a corresponding reciprocating motion to the presser I.

The connection of the levers J to the presser I is made through the medium of arms I', fixed rigidly on the presser I, and carrying pins i, which stand in slots in the lever J.

There are springs i', which press down the arms I', and there are corresponding or stronger springs i'', which hold down the main body of the presser I.

The force of these springs i'' is adjustable by means of the cords i'', which are wound and unwound upon pulleys l, which are mounted on the shaft L, which is supported on rigid arms m, fixed on the shaft M', and controlled in position by the hand-lever M.

There are two notches, N¹ and N², in the board or guide N, which is fixed on the frame A. By pressing the hand-lever M a little aside, it may be readily liberated from either notch N¹ or N², and it may then be moved to the other notch and allowed to remain there.

By shifting the hand-lever from the notch N¹ to the notch N², the shaft L and its attachments are depressed, and by shifting the hand-lever M back to the notch N¹ they are correspondingly elevated.

There are slides O O attached to the shaft L, and adapted to move up and down within the frame A, between the framing and the hot-water tank.

These carry wheels on their upper ends, as indicated by P, which are adapted to receive and support the weight of the reciprocating-presser I.

When the hand-lever M is in the notch N¹, the slides O O are in their highest position, and the presser I reciprocates at a considerable height above the rollers D, being supported on the wheels P. This is the position of the parts when the hat-roll Q is introduced.

Then the hand-lever M is shifted into the notch N², which lowers the shaft L, and correspondingly lowers the reciprocating-presser I, allowing it to rest with its full weight upon the roll of hats, and reciprocate thereon, rolling, or tending to roll, the hats first in one direction and then the other. The downward force exerted by the presser I is also increased by the springs i''.

I provide means for adjusting the force of these springs i'' with great delicacy, and to an equal extent on the opposite sides of the machine. This is effected by the turning of the shaft R, which is carried on one of the arms m.

This shaft R has an endless screw, R¹, which works in a corresponding worm-wheel, L', fixed on the shaft

L. As the hand-crank R^1 is turned in one direction or the other, it turns the worm-wheel, and consequently the shaft L and pulleys l , so as to increase or diminish the tension on the springs i^2 .

The turning of the pulleys l by means of the endless screw and worm, winds up or lets down the cords i^3 , and thus increases and diminishes the tension of the springs i^2 , as has just been explained. But it will be observed that the working of the hand-lever M also to a certain extent increases and diminishes this tension; that is to say, when the hand-lever M is changed from the notch N^1 into the notch N^2 , it not only depresses the slides O, and thus allows the presser I to descend upon the hats, and depresses the shaft L, and thus correspondingly pulls down on the springs i^2 , but it also gives a partial revolution to the wheels or pulleys l , and thus takes up the cords i^3 , and thereby increases the tension on the springs; that is to say, the tension on the springs i^2 is lessened every time the presser I is elevated, and is increased when it is depressed. Thus the force of the springs i^2 is greatest when they are made available in working on the hats, and is least when the presser is elevated and is riding idly on the wheels P.

It is important to provide against the hats traversing backward over the rollers D D. In other words, the hats must be kept in the groove or depression between the rollers D D, notwithstanding the fact that the motion of the rollers tends to carry the roll of hats continually backward in the machine, and that the motion of the reciprocating-presser I tends to promote this motion in the backward direction.

I prevent the motion of the roll in that direction, and also insure a degree of tightness in the roll which has not been before patented in felting-machinery, by means which I will now describe.

I fix to the bottom of the hot-water tank B, or to a corresponding cross-bar, a series of stops, T T.

These are made, by preference, in the form of smooth iron bars, of rectangular or slightly rounded section. They are set in deep grooves in the rearmost roller D, so as to be nearly in line with the axis of that roller, and they project up through slots in the reciprocating-presser I, as represented.

These slots are longer than the reciprocating motions of the presser, so that there is full liberty for the presser to reciprocate without touching the stops.

After each roll of hats has been sufficiently treated in the machine, the operator pulls the hand-lever M into the notch N^1 , dextrously removes the roll of hats, introduces another previously prepared, and again shifts the hand-lever M into the notch N^1 .

Now, while the machine is treating the roll of hats just introduced, by pressing it, and rubbing it between the rolls D D, the presser I and the stops T, an attendant leisurely unrolls the hats just removed, and properly shifting their position, rolls them up again,

to be again exchanged on elevating the presser I, and the operation is thus repeated until both rolls are treated.

I have experimented with the machine sufficiently to find that the felting can be conducted more rapidly, and especially that the product is more perfect than with any machine previously known to me.

The machine is obviously smaller, simpler, cheaper to construct and keep in order, and requires less power than those felting-machines in which a great number of felting-rollers is employed.

It is not absolutely essential to the success of the other portions of my invention that the presser I be lifted by the hand-lever M. It may be raised by the aid of a cord and pulley rigged above, or by any other means, and the other portions of the mechanism may operate the same as is here described.

It may be important to provide, under some conditions, against a tendency of the hats to escape from between the rollers in the opposite direction to that guarded by the stops T. In such case I can provide another series of stops on the front side, making them to project upward to a less extent, so that the hats may be readily introduced and removed over their tops.

Many other modifications may be made in the details of the mechanism without materially affecting the action of the machine, or of the parts and combinations here described.

I can employ three of the rolls D, if preferred. In such case I can treat two rolls or sets of hats in the two grooves or channels thus provided on the sides of the rollers, but I believe that no sufficient gain will result from thus complicating the structure.

I believe that I can felt successfully on a single roller D, with the reciprocating-presser and stops arranged relatively thereto about as represented, and I greatly prefer to use two rollers, and to let the roll of hats turn in the space between, as described.

I claim—

1. In combination with one or more rolls D D, the stop or stops T, and reciprocating-presser I, combined and arranged for joint operation relatively to each other, and to the means for wetting, heating, &c., in a felting-machine, substantially as and for the purposes herein set forth.

2. The lever M, the arms M' , the slides O, and wheels P, in combination with the reciprocating-presser I of a hat-felting machine, and arranged to operate therewith in the manner and for the purposes herein set forth.

In testimony whereof, I have hereunto set my name, in presence of two subscribing witnesses.

JOB W. BLACKHAM.

Witnesses:

W. C. DEY,
C. C. LIVINGS.