

(No Model.)

A. J. PIERCE.

SPEED GOVERNOR.

No. 393,853.

Patented Dec. 4, 1888.

Fig. 1.

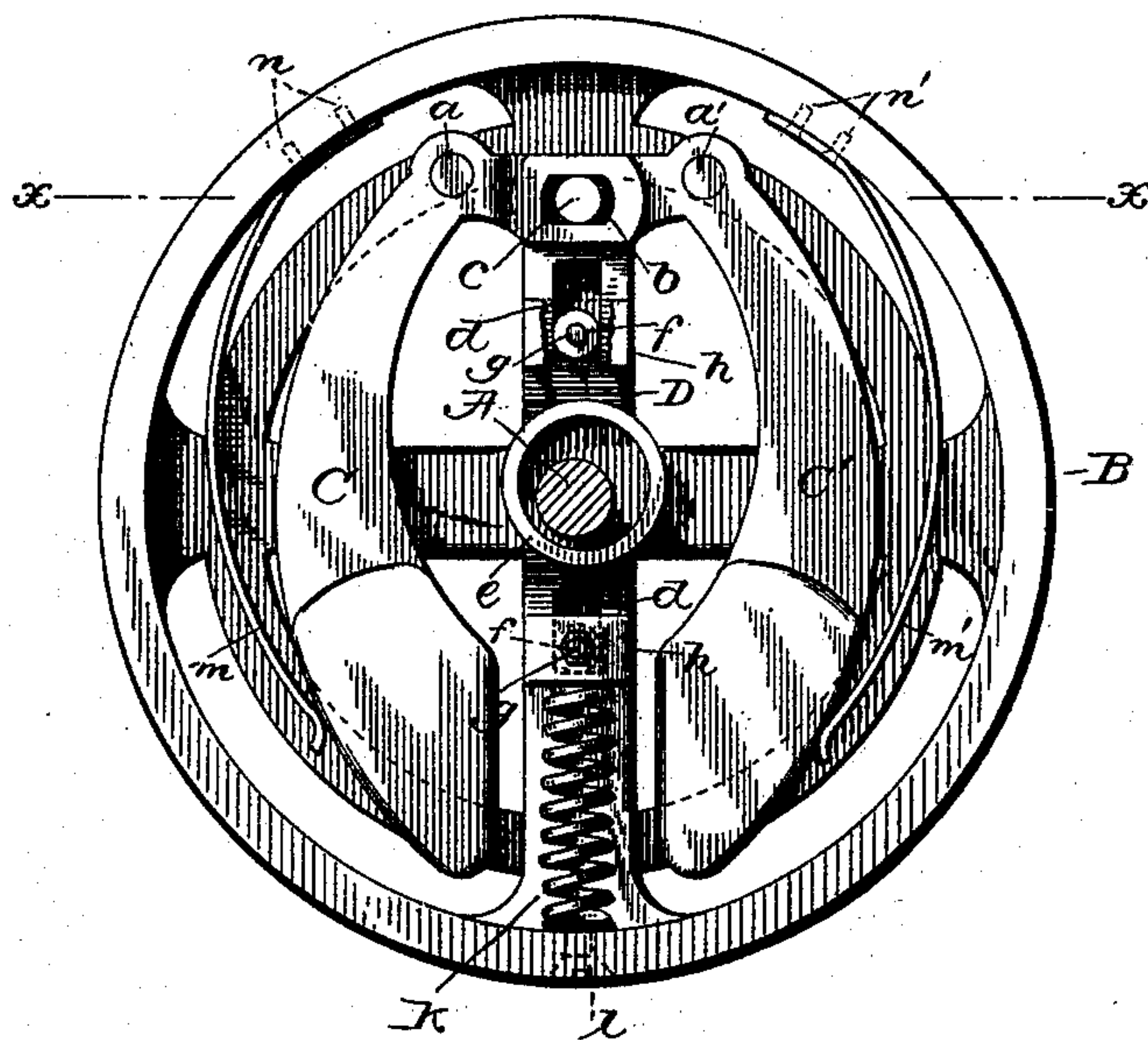


Fig. 2.

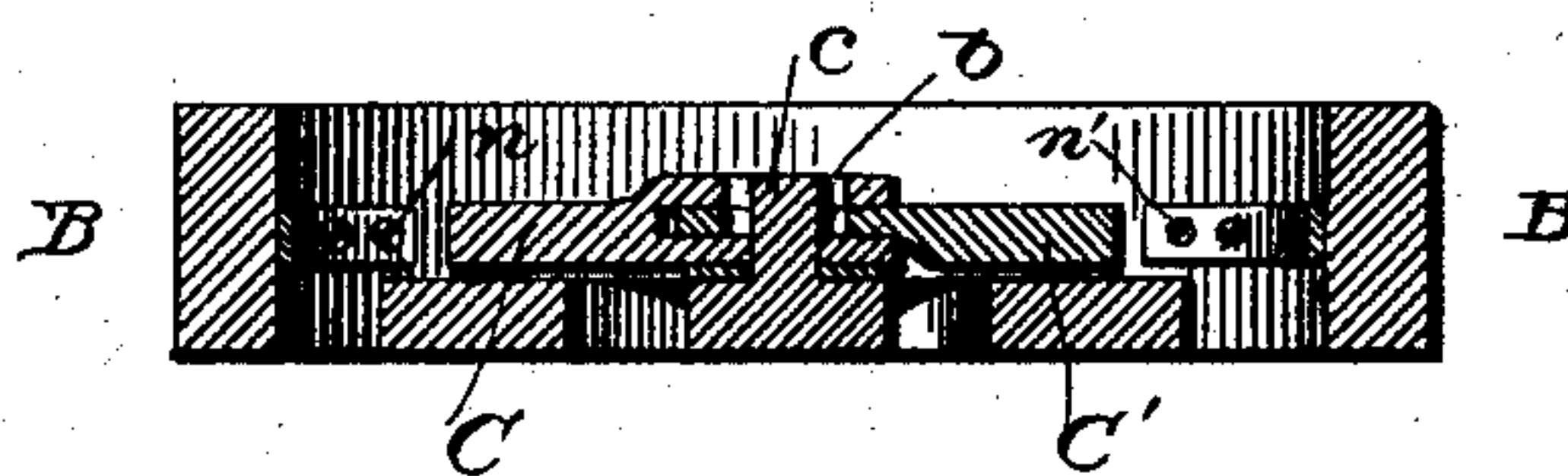
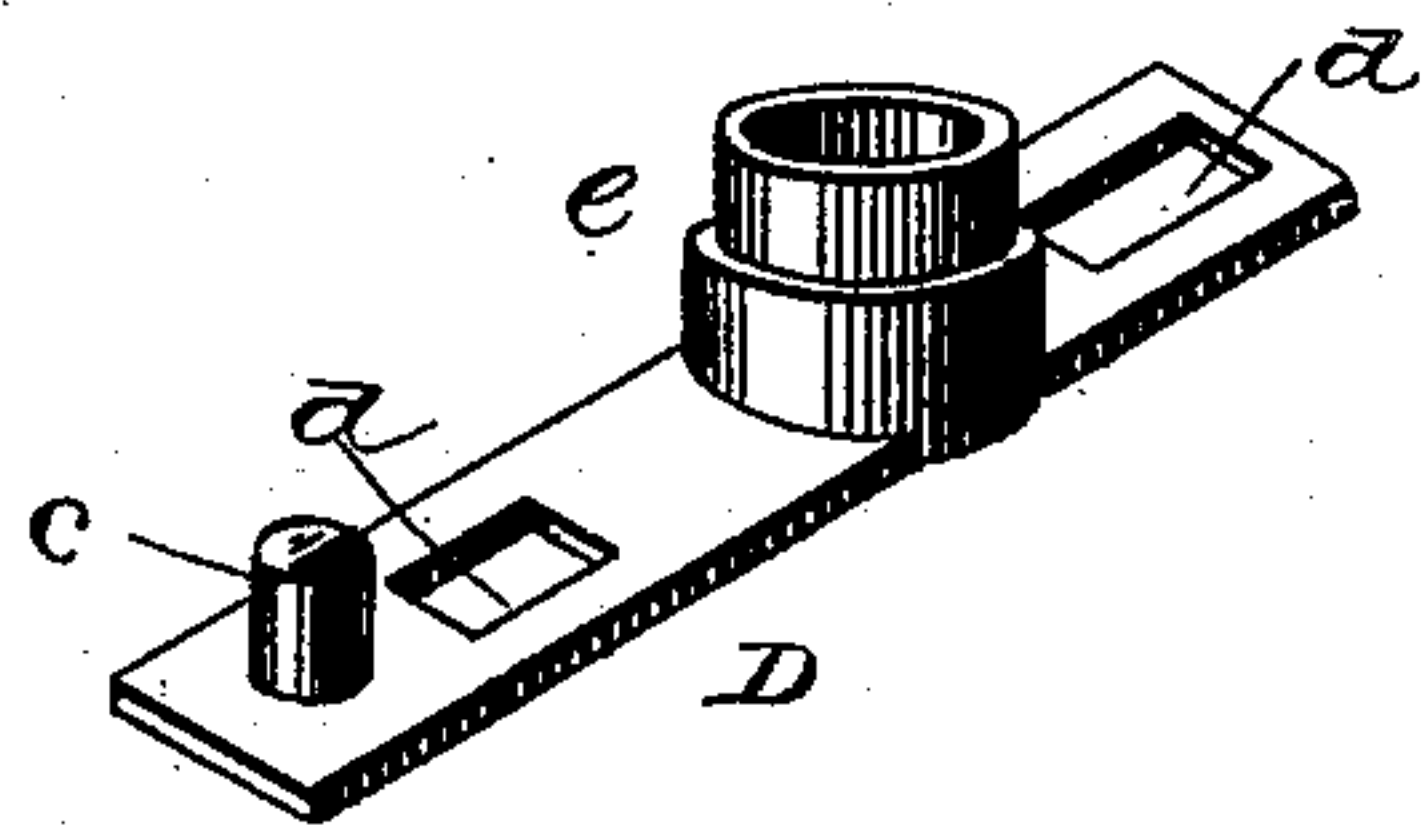


Fig. 3.



Witnesses,

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UNITED STATES PATENT OFFICE.

ANDREW J. PIERCE, OF RACINE, WISCONSIN.

SPEED-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 393,853, dated December 4, 1888.

Application filed June 8, 1888. Serial No. 276,452. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. PIERCE, of Racine, in the county of Racine and State of Wisconsin, have invented certain Improvements in Speed-Governors for Engines, of which the following is a specification.

This invention relates to that class of governors in which weights or weighted levers are pivoted to a wheel on the main shaft and connected to a slide which carries the eccentric for operating the main valve of the engine. Governors of this character have been heretofore constructed in a variety of forms; but so far as I am aware they have been objectionable by reason of the irregularity and uncertainty of their action and by reason of the difficulty of adjusting them accurately to secure definite speeds of the engine.

The invention has reference to a construction involving various details by which the usual difficulties are overcome.

In the accompanying drawings, Figure 1 represents in side elevation a governor constructed on my plan. Fig. 2 is a transverse section of the same on the line xx . Fig. 3 is a perspective view of the slide by which the eccentric is supported.

Referring to the drawings, A represents a rotary shaft—usually the main or crank shaft of the engine—and B the wheel fixed rigidly thereon. This wheel is constructed with a recessed face or with an overhanging peripheral flange to admit of the governing devices being seated therein.

C C' represent two angular weights or weighted levers, of a form approximating that of the letter L. These levers are seated within the wheel and attached individually thereto near one end by pivots $a a'$. The inner or shorter ends of the weights are overlapped or mortised together and provided with transverse slots b , through which a connecting pin or pivot, c , is passed. By means of this connecting-pin the two levers are compelled to operate in unison and are enabled to counterbalance each other as they pass one under and the other over the shaft.

D represents a slide provided in its ends with longitudinal slots d and at its middle with a tubular or hollow eccentric, e , designed to receive the valve-operating rods in the manner commonly practiced in slide-valve

engines. This slide is mounted and arranged to move automatically across the interior of the wheel, being guided by anti-friction rollers f , which are passed through its slots and connected to the wheel by bolts g , which bolts also serve to hold in place cap-plates h , overlying the face of the slide.

The pin c , which connects the two weights, is attached rigidly to one end of the slide. A spiral spring, k , bears at one end against the slide and at the opposite end against an adjusting-screw, l , seated in the wheel, by which the tension of the spring may be increased or diminished, according to the required speed of the engine.

Two springs, m and m' , of flat form, secured at one end rigidly to the inner face of the wheel-rim, are arranged at their opposite ends to bear against the outer faces of the respective weights to urge them inward. Adjusting-screws n and n' , passed through the rim of the wheel, serve to regulate the tension of said spring.

It will be observed that the springs all tend to urge the weights inward and to keep the slide in the position shown in Fig. 1 with the eccentric its maximum distance from the center of the wheel. As the wheel revolves, the centrifugal force developed causes the weights to swing outward to a greater or less extent, and the weights, in turn moving the slide inward, lessen the throw of the eccentrics and diminish the supply of steam to the engine. Owing to the positive connection of the weights with each other and with the slide, they both operate in swinging inward to carry the slide to its original and normal position.

In practice I have found that the positive and direct connection of the weights with the slide and with each other is a feature of great advantage, and that when thus connected the engine will run more steadily than when the weights merely act independently against the slide to urge it in one direction, as usual.

Preferably and in practice the governor, as shown in the drawings, forms a part of the drive-wheel of the engine; but it may be manifestly applied to the balance-wheel or an independent wheel or other support carried by the shaft, the particular form or purpose of the governor-support being obviously

immaterial, provided it is carried by the shaft.

I do not claim, broadly, a slide provided with an eccentric and combined with two
5 pivoted weights to urge it in one direction and a spring to urge it in the opposite direction, being aware that such combination is old in various forms.

Having thus described my invention, what
10 I claim is—

1. In a speed-governor for engines, the combination of a wheel fixed on the driving-shaft, the two angular weights pivoted to the wheel on the opposite sides of a central line,
15 said weights slotted and overlapped at one end, the slide mounted in transverse guides on the wheel and provided with the eccentric, the stud fixed rigidly to one end of the slide and extending through the slotted ends
20 of both weights, and the spring mounted on the wheel and acting endwise upon the weight.

2. In an engine-governor, the main shaft,
25 the wheel fixed thereon, the slide provided with the eccentric and guided to move dia-

metrically upon and across the wheel, the spring acting directly on the end of the slide, the screw acting on the spring to regulate its tension, and the two angular weights pivoted independently to the wheel, with their ends
30 slotted and overlapped, and the stud passing through the slotted ends of the two weights and rigidly fixed to the slide.

3. In an engine-governor, the rotary wheel, the two angular weights pivoted thereto on
35 opposite sides of a central line, said weights slotted and overlapped at one end, the two independent springs *m*, fixed to the wheel and acting in an inward direction on the respective weights, the slide provided with the
40 eccentric, and the stud mounted on said slide and passing directly through the slotted ends of both weights.

In testimony whereof I hereunto set my hand, this 11th day of May, 1888, in the pres-
45 ence of two attesting witnesses.

ANDREW J. PIERCE.

Witnesses:

E. G. DURANT,
J. F. BICKEL.