

No. 703,246.

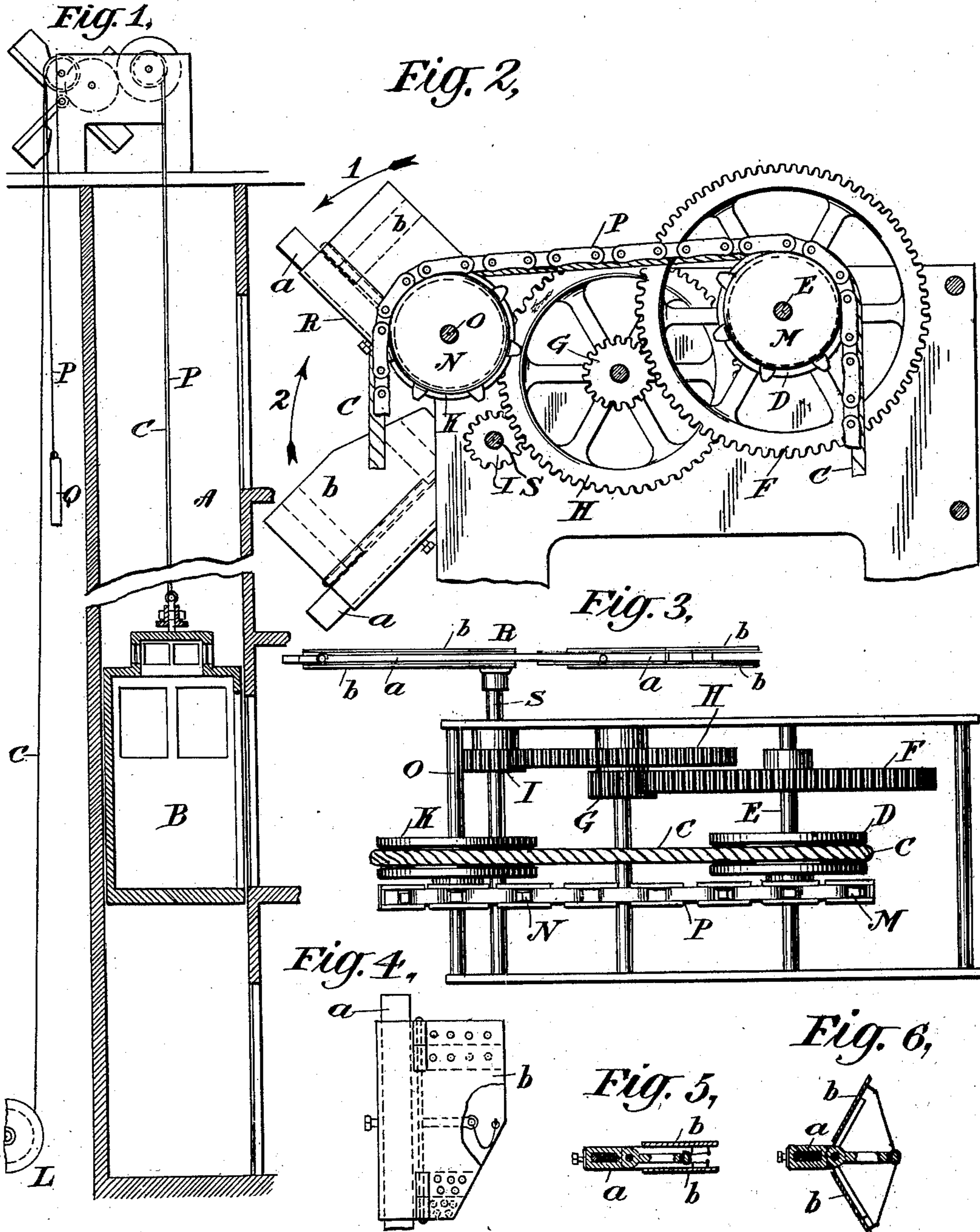
Patented June 24, 1902.

A. GALLINANT.

REGULATOR FOR CONTROLLING THE DESCENT OF ELEVATOR CARS.

(Application filed Aug. 31, 1899. Renewed Jan. 27, 1902.)

(No Model.)



WITNESSES:

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REGULATOR FOR CONTROLLING THE DESCENT OF ELEVATOR-CARS.

SPECIFICATION forming part of Letters Patent No. 703,246, dated June 24, 1902.

Application filed August 31, 1899. Renewed January 27, 1902. Serial No. 91,392. (No model.)

To all whom it may concern:

Be it known that I, ACHILLE GALLINANT, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Regulators for Controlling the Descent of Elevator-Cars, of which the following is a specification.

My invention relates to regulators for controlling the descent of elevator-cars, and is designed as an improvement on the patent of Adophe Gallinant, No. 287,922, dated November 6, 1883.

My invention consists in the novel devices herein shown and described.

In the accompanying drawings I have shown one embodiment of my invention and in which it is applied to an elevator that is raised and lowered by means of a cable.

Figure 1 is a vertical section of an elevator-shaft and car, showing the application of my invention thereto. Fig. 2 is a side elevation, on an enlarged scale, of my improved speed-regulating apparatus and of the lifting-cable and pulleys. Fig. 3 is a plan view of the same. Fig. 4 is a side elevation, partly broken away, of one wing of the governor-fan. Fig. 5 is a cross-section of the same with the leaves or pinions folded. Fig. 6 is a similar view with the leaves or pinions open or spread out.

Similar letters represent like parts in all the figures.

A is an elevator-shaft, and B is an elevator-car which may be guided in said shaft in any well-known manner.

C is the lifting or power cable, which is secured to the cross-head of the car A and passes over the pulley D, secured to the shaft E of the large gear F of the accelerating compound system of gears F G H I, and from thence over a guide-pulley K down to the power-drum L for operating the cable C for lifting the car.

M is a sprocket-wheel secured to the shaft E, and N is a similar wheel secured to the shaft O of the pulley K.

P is a sprocket-chain secured at one end to the cross-head of the car A and which passes over the wheels M and N and terminating in the weight Q.

R is the governor-fan, attached to the shaft S of the gear I and provided with the radial arms *a*, having the the folding wings or pinions *b*. The fan R should be so attached to the shaft S that when the car A is drawn up the rear of the wings *b* will advance first in the direction of the arrow 1, Fig. 2, and close said wings, as shown in Fig. 5, and so as to offer the least resistance to the air, and when the car descends the fan should revolve in the opposite direction or in the direction of the arrow 2, Fig. 2. The front of the wings *b* will thus strike the air first and be forced open, as shown in Fig. 6, and the air will offer such resistance to them that the velocity of the descent of the car will be greatly retarded and regulated. The accelerating-gears and their arrangement are substantially the same as in Patent No. 287,922 above referred to. So, also, are the construction and application of the governor-fan. They need, therefore, no detailed description.

In my invention the sprocket-chain P and the sprocket-wheels M and N take the place of the weighted rope and the drum and pulley over which said rope runs in said patent, my sprocket-wheel M being substituted for the drum on the gear-shaft. The traction-pulleys D and K for the lifting-cable I secure to the shafts of the sprockets M and N, respectively, instead of having the traction-pulleys on separate shafts, as in said patent.

By the application of the sprocket-wheel and the traction-pulley of the lifting-cable to the shaft of the large gear-wheel all danger from a too rapid revolution of said traction-wheel and a probable slipping of said cable during the descent of the car is avoided. Also, as the sprocket-wheels are on the same shafts as the driving-cable pulleys, the chain with its weight will travel in unison with the cable, will be precluded from slipping by its gearing with the sprocket-wheels, and will exert a direct and positive action upon the pulleys and cable to assist the rise of the car and to retard its descent, instead of such action being an indirect one, as in the patent above referred to. By reason of the pulleys of the lifting-cable being on the same shafts as the sprocket-wheels instead of having said pulleys on separate shafts, the entire mechanism

is rendered much more compact and less cumbersome, a most important consideration.

If desired, the governor-fan may be duplicated, another being secured to the opposite
5 end of the shaft S, or additional lifting-cables and chains, traction-pulleys, and sprocket-wheels may be used, the pulleys and wheels to be secured to the shafts E and S.

In place of the series of gears for causing
10 accelerated rotation a series of any other equivalent devices may be used for this purpose.

As the lifting-cable and sprocket-chain both
15 pass over wheels secured to the same shaft, if there should be a hitch in either the cable or the chain, so as to stop its movement, the movement of the other would also be stopped and the car would remain stationary, thereby indicating to the engineer that something was
20 out of order, so he could stop the machinery and remedy the difficulty. After the difficulty is remedied the movement of either the cable or the chain will assist in the movement of the other by rotating the wheel over which
25 it passes. Again, if the sprocket-chain should break back of the sprocket-wheels or the weight be off the chain would not slip, but would be controlled by the movement of the lifting-cable and move in unison therewith
30 by reason of the pulley over which the cable passes and the sprocket-chain being secured on the same shaft and moving in unison. Again, if the cable should break and there should also be no counterweight on the chain
35 the descent of the car would still be retarded, as the chain, which is attached to the car, would be held in engagement with its sprocket-wheels and their rotation would be regulated by the accelerating-gears and fan.

40 From the above it will be seen that it is not absolutely essential that a lifting-cable be used as a means for raising and lowering the elevator, for if the sprocket-chain be secured to the car and pass around and engage
45 with the sprocket-wheels the counterweight on the chain will assist in lifting the car and the descending car will, through the chain and sprocket wheels, act to regulate the descent of the car in the same way as if the
50 lifting-cable were used. Again, when the lifting-cable passes over rollers having their movements entirely independent of the rollers over which the safety-cable passes and an ordinary cable is used for the lifting, as in
55 Patent No. 287,922, it is necessary to make at least two turns of said cable over a pulley or drum to prevent the cable from slipping. When this construction is used, the two turns of the cable will, especially as the hanging
60 portions of the cable will always tend to assume a vertical position, bind and rub against each other, thus causing much friction to the cable and tend to wear it out. When the sprocket chain and wheels are used, as in
65 this application, the chain simply passes over the sprocket-wheels, is held by them, the

chain does not slip, and there is no binding of two parts of the chain against each other. Again, as wire cables are usually used both for lifting and safety cables, if such a cable
70 be wound around a drum or pulley with two or more turns the smaller the diameter of the pulley or drum the narrower will be its turns and the more apt are the wire strands of the cable to break, and thus weaken the
75 cable. Consequently it will be found necessary to use a pulley or drum of large enough diameter to spread out the cable to prevent such narrow bends. When a sprocket-chain
80 is used, there are no wire strands to break and there is no danger of weakening the chain by having the sprocket-wheel over which the chain passes of quite small diameter.

What I claim as new, and desire to secure
85 by Letters Patent, is—

1. A regulator for controlling the descent of elevator-cars, consisting of a series of rotary devices for causing accelerated rotation, a device arranged to be driven by said accelerating devices and adapted to offer resistance
90 to the air when revolving in one direction, and to offer no such resistance when revolving in the opposite direction, a sprocket-wheel secured to the same shaft as one of the accelerating devices, a sprocket-chain
95 passing over and engaging with said wheel, and adapted to have a weight suspended from one of its ends, and its other end adapted to be attached to the car, all as and for the purposes set forth. 100

2. A regulator for controlling the descent of elevator-cars, consisting of a series of rotary devices for causing accelerated rotation, a device arranged to be driven by said accelerating devices and adapted to offer resistance
105 to the air when revolving in one direction, and to offer no such resistance when revolving in the opposite direction, a sprocket-wheel secured to the same shaft as one of the accelerating devices, a sprocket-chain
110 passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, all as and for the purposes set forth. 115

3. A regulator for controlling the descent of elevator-cars, consisting of a series of rotary devices for causing accelerated rotation, a fan having folding wings arranged to be driven by said accelerating devices, a
120 sprocket-wheel secured to the same shaft as one of the accelerating devices, a sprocket-chain passing over and engaging with said wheel and adapted to have a weight suspended from one of its ends, and its other end
125 adapted to be attached to the car, all as and for the purposes set forth.

4. A regulator for controlling the descent of elevator-cars, consisting of a series of rotary devices for causing accelerated rotation,
130 a device arranged to be driven by said accelerating devices and adapted to offer resist-

ance to the air when revolving in one direction, and to offer no such resistance when revolving in the opposite direction, a pulley and sprocket-wheel secured to the same shaft as one of the accelerating devices, a sprocket-chain passing over and engaging with said wheel and having provision for a weight to be suspended from one of its ends, and its other end adapted to be attached to the car, the said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, all as and for the purposes set forth.

5. A regulator for controlling the descent of elevator-cars consisting of a series of accelerating-gears, a device arranged to be driven by one of said gears, and adapted to offer resistance to the air when revolving in one direction, and to offer no such resistance when revolving in the opposite direction, a pulley and sprocket-wheel secured to the same shaft as one of said gears, a sprocket-chain passing over and engaging with said wheel and having provision for a weight to be suspended from one of its ends, and its other end adapted to be attached to the car, and said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, all as and for the purposes set forth.

6. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folding wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, and said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, all as and for the purposes set forth.

7. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folding wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, and a guide-pulley situated between the other pulley and the source of power, for the lifting-cable to pass over, all as and for the purposes set forth.

8. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folded wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to

the car, said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, and a guide-sprocket-wheel situated between the other wheel and the weight for the sprocket-chain to pass over, all as and for the purposes set forth.

9. A regulator for controlling the descent of elevator-cars, consisting of a series of rotary devices for causing accelerated rotation, a device arranged to be driven by said accelerating devices and adapted to offer resistance to the air when revolving in one direction, and to offer no such resistance when revolving in the opposite direction, a pulley and sprocket-wheel secured to the same shaft as one of said accelerating devices, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car and the lifting-cable passing over said pulley in the same direction as the chain, all as and for the purposes set forth.

10. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folding wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, a guide-pulley and a guide sprocket-wheel for guiding the lifting-cable and the sprocket-chain to the source of power and to the weight respectively, all as and for the purposes set forth.

11. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folding wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, said pulley adapted to have the lifting-cable pass over it in the same direction as the chain, a guide-pulley and a guide sprocket-wheel both on the same shaft, for guiding the lifting-cable and the sprocket-chain to the source of power and to the weight respectively, all as and for the purposes set forth.

12. A regulator for controlling the descent of elevator-cars, consisting of a series of accelerating-gears, a fan having folding wings arranged to be driven by said gears, a pulley and sprocket-wheel secured to the shaft of one of said gears, a sprocket-chain passing over and engaging with said wheel and having a weight suspended from one of its ends, and its other end adapted to be attached to the car, said pulley adapted to have the lift-

ing-cable pass over it in the same direction
as the chain, a guide-pulley and a guide
sprocket-wheel both secured on the same
shaft, for guiding the lifting-cable and the
5 sprocket-chain to the source of power and to
the weight respectively, all as and for the
purposes set forth.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

ACHILLE GALLINANT.

Witnesses:

PENNINGTON HALSTED,
JOHN O. GAMPLER.