

No. 661,141.

Patented Nov. 6, 1900.

C. GEIS.
FIRE ESCAPE.

(Application filed July 2, 1900.)

(No Model.)

2 Sheets—Sheet 1.

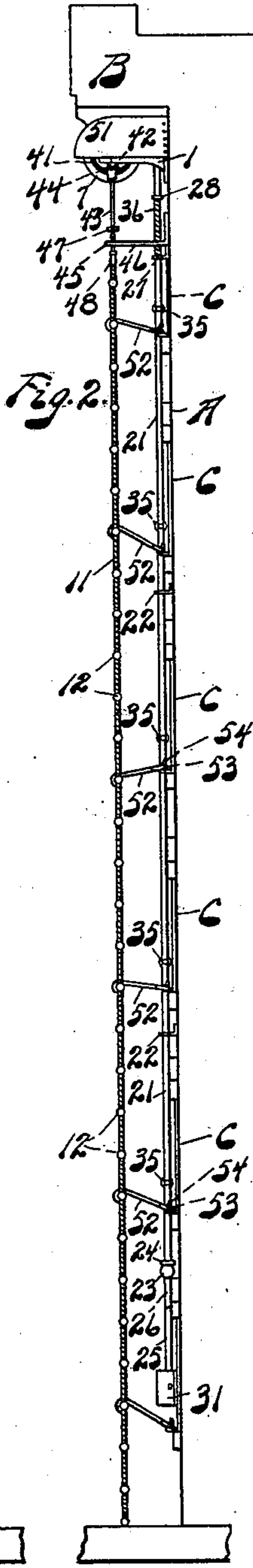
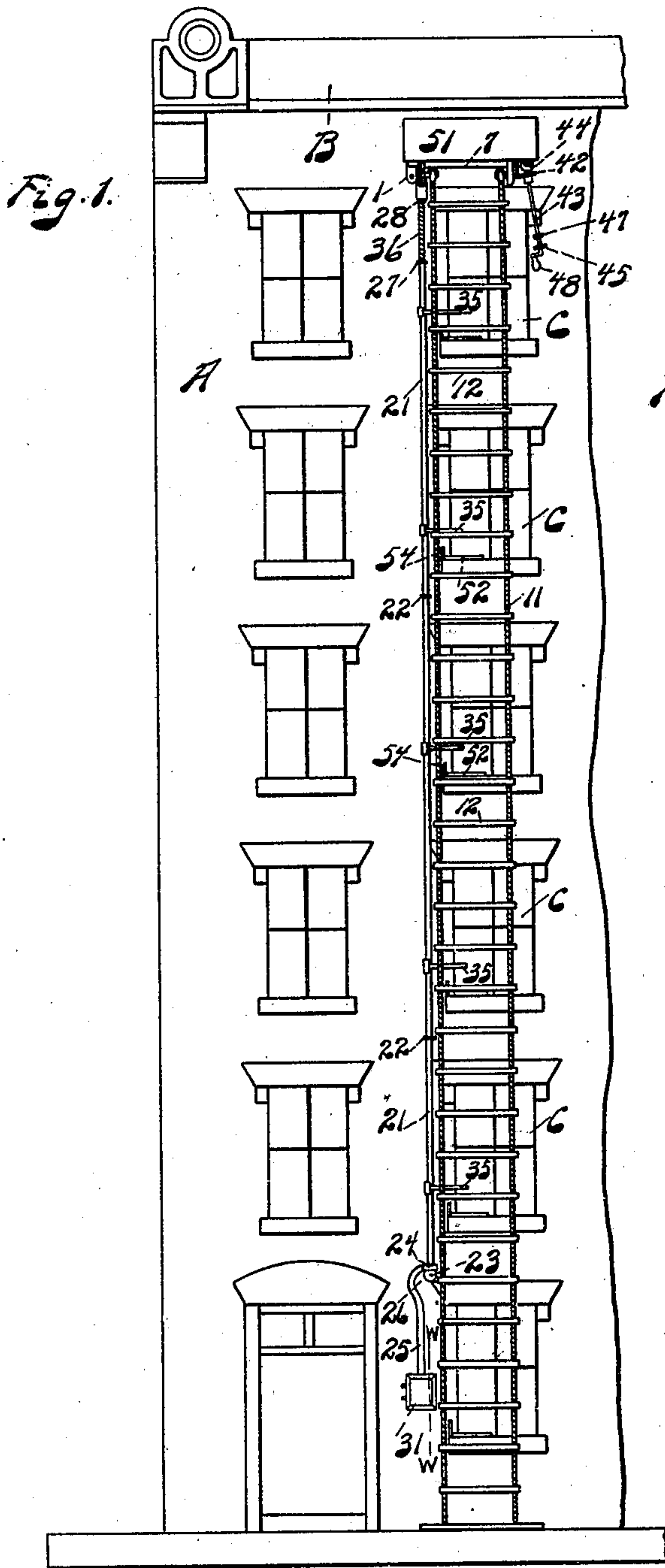
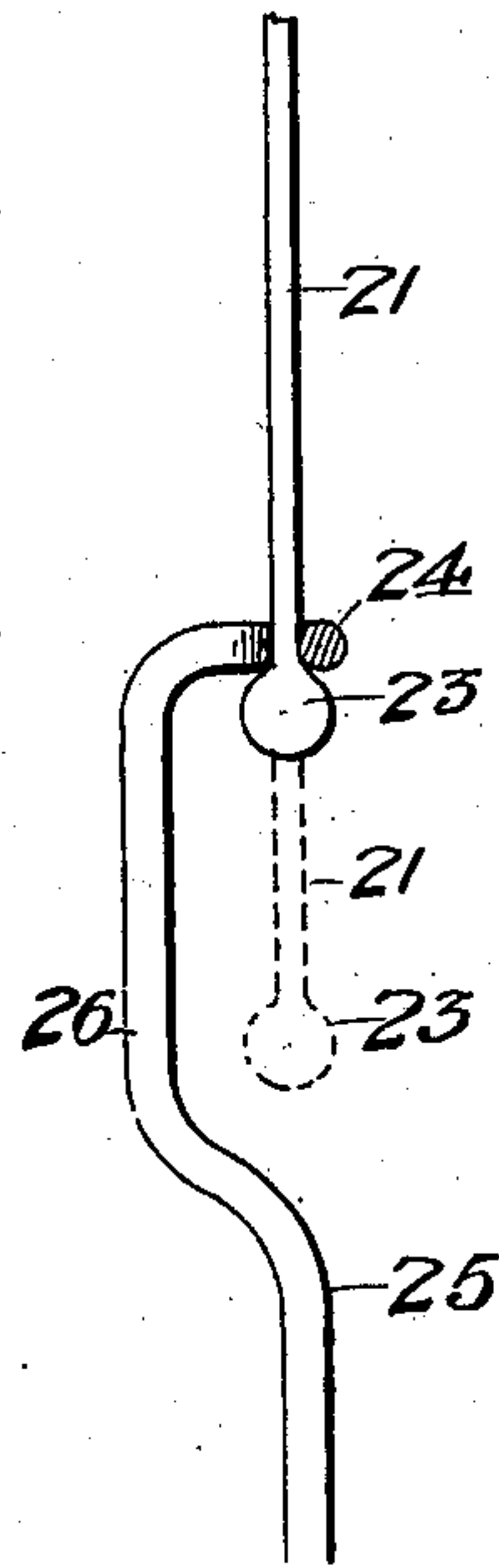


Fig. 10.



Witnesses:
Emil Kapp
Florence Brudes.

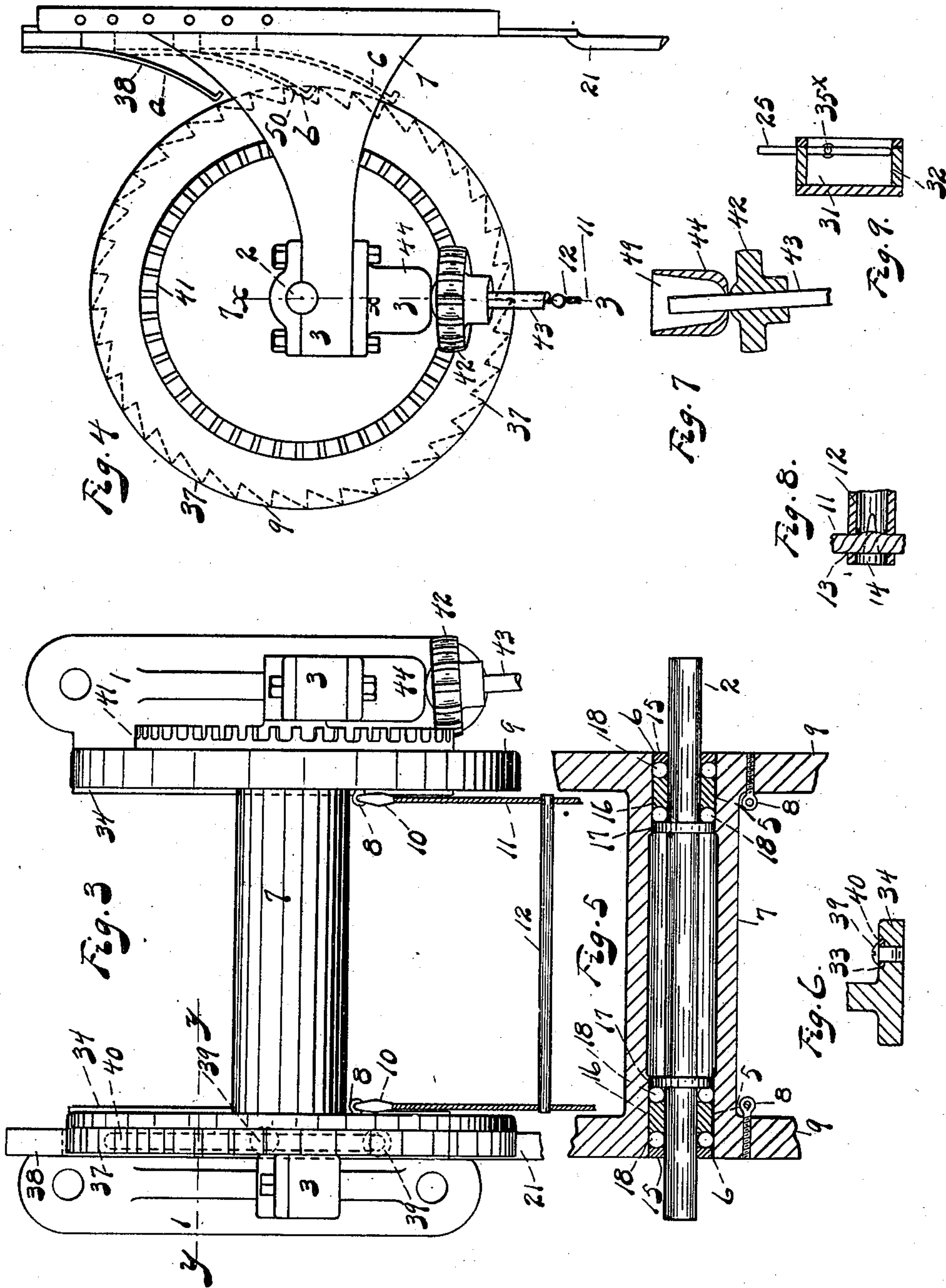
Inventor:
Charles Geis,
by A. J. Hebeleb, his Attorney.

C. GEIS.
FIRE ESCAPE.

(Application filed July 2, 1900.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES GEIS, OF CINCINNATI, OHIO, ASSIGNOR OF TWO-THIRDS TO
EDWARD GEIS AND HENRY A. MEYER, OF SAME PLACE.

FIRE-ESCAPE.

SPECIFICATION forming part of Letters Patent No. 661,141, dated November 6, 1900.

Application filed July 2, 1900. Serial No. 22,296. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GEIS, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Fire-Escapes, of which the following is a specification.

My invention relates to fire-escapes, and has for its object the providing of a fire-escape capable of attachment to the outside of a building without disfiguring the same and in such manner as to be practically unnoticeable when out of use, which may be operated from any floor and when in use serve all the floors, and having the mechanism for throwing the escape into use extending along the outside of the building and capable of being operated by the inmates from various floors, so arranged as to contain no combustible parts and so placed as to be practically free from danger of combustion.

My invention consists in the parts and in the construction, arrangement, and combinations of parts hereinafter more fully described and claimed.

In the drawings, Figure 1 is a front elevation showing my improved device with the ladder in pendent position attached to a building. Fig. 2 is a side elevation of the same, showing the securing-hooks attached to the ladder. Fig. 3 is a front elevation of the reel portion of my device and adjacent parts with the hood omitted. Fig. 4 is a side elevation of the same. Fig. 5 is a longitudinal vertical section on the line *xx* of Fig. 4, showing the connection between the shaft and reel. Fig. 6 is a detail in cross-section on the line *yy* of Fig. 3. Fig. 7 is a detail in section on the line *zz* of Fig. 4. Fig. 8 is a sectional detail of a ladder part. Fig. 9 is a detail in section on the line *ww* of Fig. 1. Fig. 10 is a detail, partly in section, showing the connection between the meeting ends of the divided rod, showing the upper section of the rod also in depressed position in dotted lines.

A represents a building, under the eaves B of which my improved device is adapted to be secured to serve all the floors of the building, making it unnecessary to provide each room with a separate rope ladder or other fire-escape device, thus saving expense and avoid-

ing a ponderous and unsightly and expensive permanent fire-escape structure on the walls of the building and permitting a fire-escape to be placed in locations where it is inadvisable, impractical, or impossible to locate a permanent fire-escape structure.

In my preferred form suitable brackets 11 are secured to the wall of the building under the eaves. They support a shaft 2, rigidly secured in bearings 3. The shaft supports ball-bearings 5, about which bearings 6 of a reel 7 revolve. Eyebolts 8 take into the flanges 9 of the reel and receive eyelets 10 on the flexible ladder 11. The ladder is composed of wire cables connected by gas-pipe, forming rungs 12. The cables take through apertures 13 in the rungs, a pin 14 being driven through the cable from the end of the rung, binding the cable within the rung and preventing displacement. The rungs are of a length to easily pass between the flanges of the reel, with the exception of the lowest, which is of a length to prevent its passage beyond the lower edges of the brackets, so as to prevent its being drawn upon the reel, and it affords a continually-pendent end for the ladder. The ball-bearings consist of retaining-collars 15 16 17, taking about the shaft, with suitable balls 18 between them, the collars 15 and 17 being rigidly secured to the shaft and the collar 16 taking loosely thereabout.

A rod 21, of iron or other suitable material, extends from the reel position to the top of the first floor, past all the intervening floors, and readily accessible from the windows C of all the intervening floors, on the outside of the building, brackets 22 aiding in holding it in position, the rod passing through eyelets in the brackets. Its lower end has a knob 23, an eyelet 24 on a second rod 25 taking about the rod 21 above the knob, there being a loop 26 in the rod 25 below the eyelet. The lower end of the rod 25 takes into a box 31, normally locked, and against the bottom thereof, which latter acts as a stop for the rod. The box may at one side be provided with hinges, by which it is supported from the wall, and at its other with a lock. Its bottom may extend to the wall or a cleat rigidly secured to the wall. The bottom there-

by forms a rest for the lower end of rod 25, as shown more clearly in Fig. 9, while its top may be cut away at its middle, next to the wall or cleat, to permit the rod 25 to pass therethrough and to provide a clearance for the rod when the box is swung on its hinges. When the box is unlocked, it may be swung aside, carrying its bottom or stop with it and leaving the rod 25 free to be depressed, carrying the rod 21 with it by reason of its eyelet-and-knob connection therewith. The purpose of this box is to prevent the rod 25 being depressed from the outside when the box is locked. The parts 21 and 25 form a divided rod. When the part 21 is depressed, its lower end slides in the eye 24, while the part 25 remains at rest, the lower end of the part 21 assuming the position shown in dotted lines in Fig. 10. When the part 25 is depressed, its eye 24 takes the knob 23 with it in its movement, and thereby depresses the part 21 when the part 25 is depressed. It will readily be seen that when the part 21 is depressed the part 25 remains at rest, but when the part 25 is depressed the part 21 is also operated thereby. At each floor above the ground floor the rod 21 is provided with an operating-lever 35 in suitable position to be readily manipulated from a window-opening. A similar lever 35^x is placed in the box 31. A spring 36 maintains the rod in elevated position. It takes between a bracket 27, attached to the building, and a collar 28 on the rod.

The reel is provided with suitable projections or ratchet-teeth 37. A contact-piece or spring-pawl 38 is attached to the rod 21 and is adapted to momentarily engage with the teeth 37 and turn the reel when the rod is depressed. The spring-pawl is of such construction that when the rod is depressed its end will take against the ratchet-teeth, and when the rod is released and raised its flat side takes against the ratchet-teeth, allowing it to repass for another advance movement of the reel. The upper end of the rod 21 is flattened and is secured to a bracket 1 in ways 33 on an extension 34 by means of bolts 39, taking through a slot 40. Each bracket may have an extension and way for readily attaching the pulling device to either side of the reel. A circular rack 41 is secured to a reel-flange. A pinion 42 is secured to a shaft 43, journaled in bearings 44 45. The bearing 44 is secured to a bracket and the bearing 45 to an arm 46, attached to the building at a suitable point. The shaft is permitted a longitudinal movement to bring the gear in and out of mesh with the rack. It is normally out of mesh, the shaft supported by a collar 47 upon the bearing 45. The end of the shaft is adapted to receive a crank 48, which is removable. The shaft extends diagonally to the side to allow the lower rung to pass the arm 46 without obstruction when winding or unwinding the ladder. The bear-

ing 44 is narrow and merges into a flaring opening 49 in the form shown in Fig. 7 to permit the shaft to be set at various angles to a vertical position to accommodate itself to the building upon which it is being placed and allow the shaft to be readily moved longitudinally without meeting obstruction in its manipulation. The pinion is slightly rounded in longitudinal cross-section to permit of its readily meshing with the rack in various positions.

The ladder is normally wound upon the reel with the free end of the ladder toward the house. In case of fire, or if it is desired for other reason to have the ladder descend, any occupant of the building may, by depressing any of the levers 35 at any floor, cause the ladder to descend, or a fireman or policeman may open the box and depress the lever therein to bring down the ladder. Depressing a lever 35 or 35^x depresses the rod 21 and causes the pawl 38 to make contact with and depress a tooth 37, thereby slightly revolving the reel and causing part of the ladder to unreel. The reel is normally very nearly balanced, and the slight turning of the reel by the depression of the rod will start the ladder, or the levers may be pushed down a number of times, the spring 36 returning the rod to normal position after each depression and the pawl repassing the teeth depressed. After the ladder is started in its descent the weight of the unwinding end will unwind it, the ladder gradually receding from the house as it is unwound to miss cornices and signs. When the ladder is unwound, the momentum of the reel will cause the fastened end of the ladder to partly climb upon the reel in the reverse direction and again unreel and gradually come to rest. The ladder, being fastened to the reel by means of eyes in the manner stated, permits this without injury to the cables. The rod may also be held in such position that the outer flat side 50 of the pawl may be pressed against the teeth, as shown in dotted lines *b* in Fig. 4, and act as a brake to avoid the too-rapid descent of the ladder. Normally the spring-pawl is in the position *a*, and when depressed is in the position *c* past the teeth, so that a sudden depression will start the ladder. If it is desired to wind the ladder upon the reel, the crank 48, which is normally detached from the winding-shaft, is attached thereto, the shaft moved longitudinally to bring the pinion 42 into mesh with the rack 40, and the shaft turned until the lower rung makes contact with the brackets 1 1, when the reel and ladder wound thereon will be in substantially balanced position, capable of being unreel by being given a slight impetus. When the winding operation is completed, the pinion is moved out of mesh with the rack and the crank removed.

When the ladder is depending, it is sufficiently far from the wall of the building to allow persons to descend between it and the wall, so that persons may step from the win-

dows upon the ladder without turning around. Suitable hooks 52 are provided at each window-sill, which may be placed over a ladder-rung and have an eye 53 adapted to be placed upon a hook 54 in the building to prevent the ladder from swaying. The ladder when depending may also be swung diagonally to one side to reach adjoining windows.

A hood 51 takes over the reel, ladder, and shaft and protects the same from weather. The reel operating on ball-bearings in the inside of the reel-hub prevents rust and consequent "sticking" of parts when action is desired.

When the ladder is in normal position, wound upon the reel, the reel and its attendant parts are obscured under the eaves of the roof, the small rod being practically the only part observable, so that my device presents a neat structure, not disfiguring a building or noticeable to appreciable extent. All of the parts are on the outside of the building, out of danger of being destroyed by fire, are non-combustible, cheap in construction, durable, and substantial. The rod or pulling device for unreeling the ladder may be slight in cross-section, as it is subjected to a pulling strain only.

I have shown my fire-escape attached to a six-story building; but it is obvious that it may be extended indefinitely to serve buildings of greater height.

The fire-escape is so arranged that it may be operated by a fireman or any other person from the outside of a building, and thus give the firemen and others ready access to all the floors in a much quicker manner and time than it would require for the firemen to raise their own ladders. My fire-escape may also be put in use before the arrival of the firemen.

My fire-escape ladder reaches heights it would be impossible to reach by the ladders of the fire service, enabling firemen and others to reach otherwise inaccessible parts of the structure for carrying hose or saving life and helping otherwise timid men, women, or children to escape.

My improved device is simple and economical in construction and operation, durable, and of few parts.

I claim—

1. The combination, in a fire-escape, of a reel and a flexible ladder therefor adapted to be secured at or near the roof of a building for serving various floors thereof, ratchet-teeth for the reel, a pawl reciprocating bodily for making contact with the ratchet-teeth, and positively rotating the reel, and a connection with the pawl extending past various floors of the building and operable from each, substantially as described.

2. In a fire-escape, the combination of a reel and flexible ladder therefor for attachment at or near the roof of a building for serving various floors thereof, a divided rod ex-

tending past various floors and operable from each, a connection at the upper end of the latter for turning the reel, and constructed and arranged for operating the upper end of the rod while the lower end remains at rest and for operating both ends from the lower end, substantially as described.

3. In a fire-escape, the combination of a reel and flexible ladder therefor for attachment at or near the roof of a building for serving various floors thereof, projections for the reel, and a slide and contact-piece thereon for the projections, constructed and arranged for permitting the slide and contact-piece to be reciprocated for making repeated contact between the contact-piece and projections and positively rotating the reel, with a pulling device connecting with the slide for imparting an unreeling motion to the reel and extending on the outside of the building past the various floors and operable from each, substantially as described.

4. The combination, in a fire escape, of a reel and a flexible ladder therefor, ratchet-teeth for the reel, a slide, a pawl thereon, means for reciprocating the slide, constructed and arranged for making contact between the pawl and teeth and rotating the reel in the forward movement of the slide and for permitting the pawl to pass the teeth in the retrograde movement of the slide, substantially as described.

5. The combination, in a fire-escape, of a reel and a flexible ladder therefor, ratchet-teeth for the reel, a slide, a spring-pressed pawl thereon, means for reciprocating the slide and pawl, constructed and arranged for making contact between the pawl and teeth and rotating the reel in the forward movement of the slide with the pawl constructed and arranged for permitting the pawl to pass the teeth in the retrograde movement of the slide and to take against the teeth for acting as a brake on the reel when unreeling the ladder, substantially as described.

6. The combination, in a fire-escape, of a reel and a flexible ladder therefor for attachment at or near the roof of a building for serving various floors thereof, projections for the reel, and a reciprocating contact-piece for making contact with the projections, constructed and arranged for making repeated contact between the contact-piece and projections for unwinding the ladder, with a pulling device connecting with the contact-piece for imparting an unreeling motion to the reel and extending on the outside of the building past various floors and operable from each, substantially as described.

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

CHARLES GEIS.

Witnesses:

EARLE R. PASSEL,
FLORENCE BRANDES.