

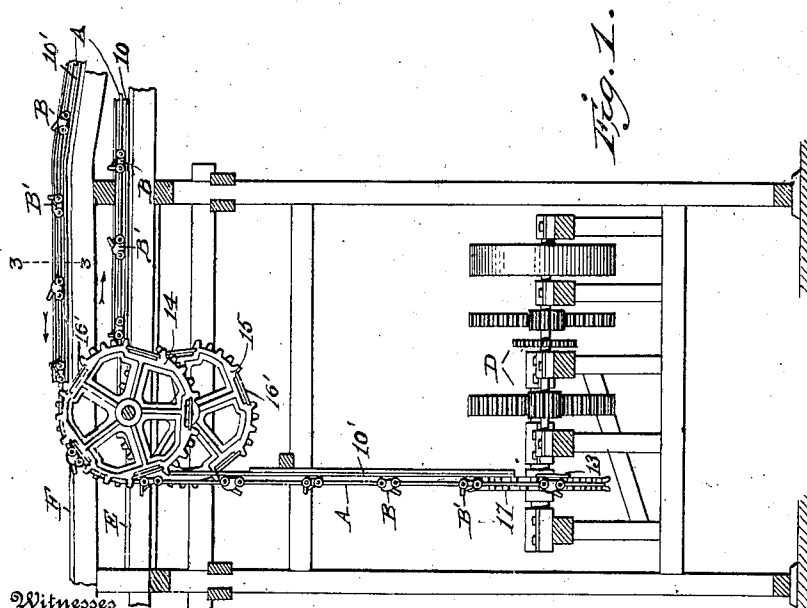
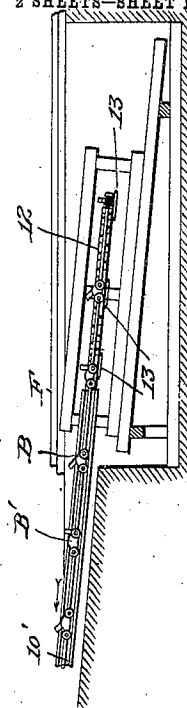
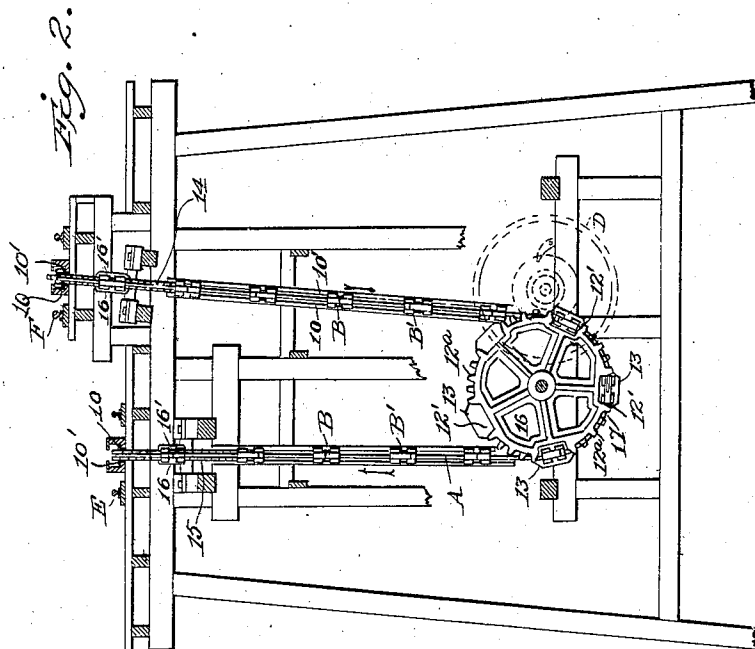
No. 844,164.

PATENTED FEB. 12, 1907.

C. W. MILLER.
CAR HAUL.

APPLICATION FILED JAN. 9, 1906.

2 SHEETS—SHEET 1.



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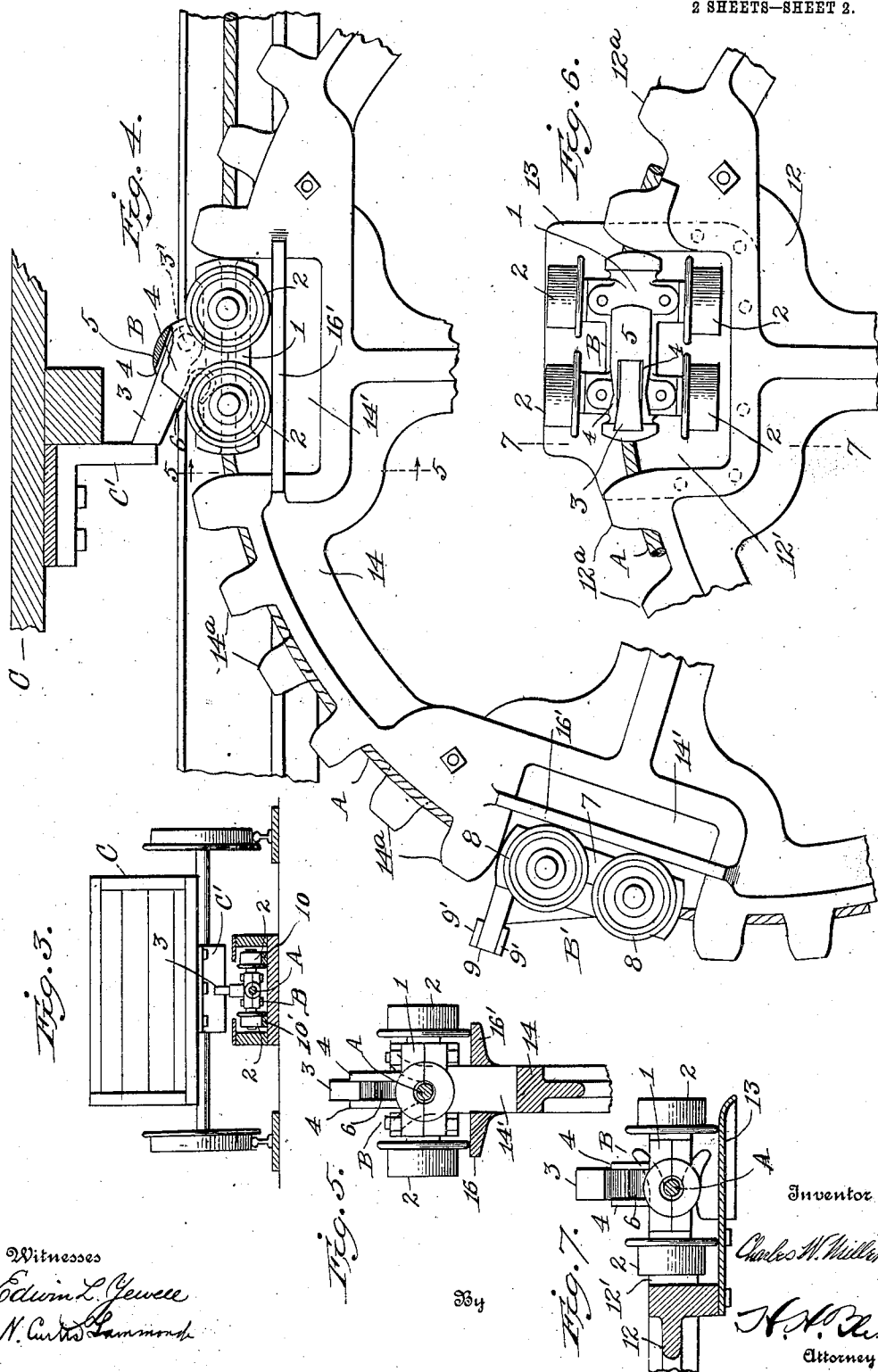
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

CHARLES W. MILLER, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY,
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CAR-HAUL.

No. 844,164.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed January 9, 1906. Serial No. 295,304.

To all whom it may concern:

Be it known that I, CHARLES W. MILLER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Car-Hauls, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in hauling apparatus of the class adapted both to propel and to control the travel of cars along grades.

It relates particularly to such a system in which a flexible endless cable or chain is extended around a circuit, along both the upleading and downleading paths of which the travel of the cars is controlled by car-engaging elements carried by said draft device and each of which normally projects upwardly therefrom along both of said paths.

The object of the invention is to provide simple and efficient means for guiding the cable or chain from one run to the other in such manner that the car-engaging attachments thereon will maintain the same relation thereto along both the uprun and downrun and will not be permitted to turn and twist the cable at the points where its course of travel is deflected.

The invention is particularly applicable for use in connection with an endless chain or cable haul having secured thereto and carried thereby car-engaging attachments which are mounted upon antifriction-rollers and which are adapted to be supported upon and run along guide or track ways provided along the up and down runs of the system.

Figure 1 is a side elevation of an apparatus embodying my improvements. Fig. 2 is an end elevation of the same at the end at which power is applied to the system. Fig. 3 is a section on the line 3 3, Fig. 1. Fig. 4 is a side elevation of a portion of one of the guide-sheaves which is adapted to deflect the cable while maintaining the car-engaging elements or arms thereon in the same plane as the sheave. Fig. 5 is a section on the line 5 5, Fig. 4. Fig. 6 is a plan view of a portion of one of the sheaves which is adapted to deflect the cable while maintaining the car-engaging elements or arms thereon transverse

to the plane of the sheave. Fig. 7 is a section on the line 7 7, Fig. 6.

In the drawings, A represents as an entirety the endless cable or chain draft device; B B', a pair of cooperating car-engaging attachments thereon; C, a car having an attaching engaging elements C', and D the mechanism through which power is applied for actuating the endless draft device.

E and F represent conventionally-disposed parallel trackways arranged for the greater part of their length at an inclination to the horizontal, and the former directing the travel of the uprunning cars and the latter directing the travel of the downrunning cars.

As my invention does not pertain to the apparatus and the arrangement of parts as an entirety, it will not be necessary to here give a detailed description of the same, and the parts hereinbefore referred to are simply shown for the purpose of illustration.

The attachments B B' are arranged, as hereinbefore referred to, in pairs. The attachments B comprise a two-part cable-gripping element or clamp 1, separable on longitudinal lines and supported by four antifriction-rollers 2 and an upwardly-extending yielding arm 3. The antifriction-rollers 2 are mounted at front and rear on either side of the said clamp. The upper part of the clamp has upright webs or walls 4, supporting an inclined top wall 5. The yielding arm 3 is pivotally mounted between the said upright walls 4, as indicated at 3', and it is normally pressed upward into engagement with the top wall 5 by means of a flat curved spring 6, having one end secured to the upper surface of the upper part of the clamp and its free end bearing against the under surface of the said yielding arm. The attachments B' likewise consist of a two-part longitudinally-separable clamp 7, two pairs of antifriction-rollers 8, and an arm 9. This arm 9, however, is either formed integrally with or is rigidly secured to the top part of the clamp. 9' 9' are wearing-plates secured to the upper end of the arm 9 and are adapted to engage with the attachment or arm C' on the car.

10 10' indicate guide-rails arranged adjacent to the upleading and downleading runs of the cable and at either side of the vertical

plane of travel thereof and adapted to be engaged by the antifriction-rollers on the cable-trucks in their travel.

At the lower end of the system the cable is deflected or guided from its lower run to its upper run by a guide sheave or wheel 12. In most systems, as in the one here described, this guide-sheave at the lower end of the system is arranged beneath the trackways for the cars at this point and is slightly inclined to the horizontal. It is essential that the cable-trucks be guided from the downrun to the uprun in such manner that they will not turn out of position and twist the cable, since it is necessary that they should normally travel along both runs with their arms or dogs extending upwardly. The guide-rails 10 10' for the antifriction-rollers extend to a point closely adjacent to the sheave 12. The periphery of this sheave is recessed at intervals, as indicated at 12', in order to receive the cable attachments or trucks, and between these recesses cable-guiding teeth 12^a project alternately from one side of the wheel and then the other in the well-known manner.

13 are plates detachably secured to or formed integrally with the under surface of the sheave 12 at the recesses 12' therein. These plates form a bottom wall for the said recesses and extend from the inner wall of the recess outwardly a distance equal to the width over all of the cable-trucks. It will be seen that as one of the said trucks leaves the lower end of the guides 10 10' on the downrun and enters one of the recesses 12' in the sheave its antifriction-rollers on either side engage with the upper surface of one of the truck or attachment supporting plates 13 in such manner as to prevent the truck from turning and twisting the cable. The trucks travel around in this condition in the recesses in the sheave 12 until they start on their uprun, when they at once engage the guide-rails 10 10' therealong.

The vertically-disposed sheaves at the upper end of the system, which are indicated by 14, 15, and 16, are all of the same construction, so that only one of them need be described. Thus the sheave 14 is provided with recesses 14' at intervals about its periphery, which are adapted to receive the cable attachments in the well-known manner, and between these recesses the periphery of the sheave preferably carries the alternately-disposed cable-guide teeth 14^a. 16 16' are guide-plates having their outermost surfaces transverse to the plane of the wheel and each arranged at either side of the wheel and each extending across one of the recesses 14' therein. These guide-plates may be formed integral with the wheel, or they may be rigidly and detachably secured in position thereon in any desired manner.

Each one of them extends laterally a sufficient distance to be in the plane of travel of the antifriction-rolls on the cable-trucks at that side of the sheaves, and as the cable-trucks enter the recesses the antifriction-rollers engage with the laterally-projecting guide-plates and are by them held from turning and twisting the cable. The guide-rails 10 10' for the antifriction-rollers are at the upper end of the system likewise carried to a point in close proximity to the peripheries of the guide-sheaves for the cable, so as to insure the proper directing of the cable-trucks onto the sheave 14 and from the sheave 16 onto the downrunning guides.

The operation of these cable-attachment engaging and guiding devices on the sheaves will be readily understood. As each attachment or clamp leaves the guide-rails 10 10' and enters one of the recesses in the periphery of the adjacent sheave it is engaged by a suitable plate or by laterally-extending ribs or flanges carried by the sheave and is prevented from turning and twisting the cable. So, too, as the attachment leaves the sheave to pass onto the guide-rails 10 10' it is properly directed thereon with its car-engaging element or elements projecting upwardly.

I am aware of the fact that in earlier endless-cable haul systems devices have been provided for preventing the turning of the cable attachments as they are deflected by a guide wheel or sheave from one of their paths of travel to another in order to prevent the twisting of the cable—such devices, for example, as are shown in Patents Nos. 93,361, of August 3, 1869, to Smith; No. 788,861, of May 2, 1905, to Wagner, and No. 722,951, of March 17, 1903, to Damron. In these earlier devices, however, the attachments are kept from turning by means of a stationary guide-rail, with which they engage and which extends concentrically around the periphery of the guide-sheave and closely adjacent thereto; but in these earlier devices frictional resistance and wear and tear occurs between the said stationary guide-rail encircling the sheave and the parts of the cable attachment with which it engages. It will be noted that in my construction the cable-attachment engaging and guiding devices rotate or travel with the cable-deflecting device and that in this particular they are essentially different from the earlier devices which are intended to perform substantially the same function.

I make no claim to the arrangement of parts shown in the drawings for applying power to the endless draft device for actuating it, as I believe the same to be the invention of Archibald W. F. Steckel and shown and described in his application for patent, Serial No. 269,873, filed July 15, 1905. Where the drive is thus effected, it

will be noted that guide-rails 10 10' should extend from the sheave 14 to the power-applying sheave 17 and from the latter to the sheave 15. The power-applying sheave 17 should be of construction similar to that of the sheave 12 and is so indicated. The sheaves, with the plates or guides extending transversely from either side thereof at the cable-truck-receiving recesses, are adapted to deflect the cable while maintaining the car-engaging arms carried by the trucks in the same plane as the sheave, while the sheaves with the cable-truck-supporting plates arranged only at one side of the recesses therein, are adapted to deflect the cable while maintaining the car-engaging arms on the cable attachments transverse to the planes of the sheaves.

What I claim is—

1. In a car-haul system, the combination of an endless draft device arranged to travel around a circuit having a pathway for upward-moving cars and a pathway for return or downward-moving cars, supporting and guiding devices for said endless draft device arranged to deflect it and to direct it from one to the other of said pathways, a car-engaging element carried by said draft device, and means arranged to engage with and to travel with said car-engaging element while it is being deflected from one of said paths of travel to the other to prevent it from turning and twisting the cable.

2. In a car-haul system, the combination of an endless draft device arranged to travel around a circuit having a pathway for upward-moving cars and a pathway for return or downward-moving cars, supporting and guiding devices for said endless draft device arranged to deflect it and direct it from one to the other of said pathways, means for guiding said element along the said pathways, and means arranged to engage with it and to travel with it while it is being deflected from one to the other of said pathways to prevent it from turning and twisting the cable.

3. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and a downleading path of travel for cars, of car-engaging elements secured to said endless draft device having upwardly-extending arms adapted along said upleading and downleading runs to be maintained above the endless draft device at all times and to control the travel of the cars along both of the said runs, means for deflecting the endless draft device from one path of travel to the other, and means for engaging said car-engaging elements as they leave one path of travel and for traveling with them and directing them to their other path of travel and

adapted to prevent their turning or rocking out of position between said paths of travel.

4. In a car-haul system, the combination with an endless draft device having an upleading and a downleading path of travel, car-engaging elements carried by said draft device having arms adapted to normally project upwardly along both of said paths of travel and to engage and control the movements of the car therealong, and deflecting devices for directing said endless draft device from one of its paths of travel to the other, of guiding devices adapted to engage said car-engaging elements and to travel with them from one of the said paths of travel to the other so as to maintain them in their upright positions and to prevent their swinging out of the same and twisting the cable.

5. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and a downleading path of travel for the cars, a series of attachments carried by said draft device and having car-engaging elements adapted to control the travel of the cars along both their upward and downward paths of travel, each of said elements being for this purpose maintained in upright position along each of said paths, and rotary guiding mechanism for deflecting said endless carrier from one of said paths to the other, of means carried by said guiding mechanism for preventing the turning of the said attachments while they are traveling thereon and for directing them from one path of travel to the other so that their car-engaging elements remain above the endless draft device along both of said paths of travel.

6. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and a downleading path of travel for the cars, and a series of attachments carried by said endless draft device and having car-engaging elements each adapted to at all times project upwardly from said endless draft device and to control the movement of the cars along either of said paths of travel, of rotary devices for guiding said endless draft device from one of its paths of travel to the other, each of said rotary devices having guides adapted to engage with the attachments on the said draft device and to prevent their turning and twisting the cable while they are being directed from one to the other of said paths of travel.

7. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and downleading path of travel for the cars, and a series of attachments carried by said endless draft device having car-engaging elements each adapted to extend normally up-

ward from the draft device along both its paths of travel, of guide-sheaves for directing said endless draft device from one path to the other, each of said sheaves having guides arranged to engage with the said attachments on the endless draft device and to prevent their turning and twisting the cable as they pass from one to the other of said paths of travel.

8. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and downleading path of travel for the cars, and a series of attachments carried by said endless draft device having car-engaging elements each adapted to extend normally upward from the draft device along both its paths of travel, of guide-sheaves for directing said endless draft device from one path to the other, each of said sheaves having recesses adapted to receive said attachments, and guide-plates arranged at the recesses and adapted to engage said attachments and prevent their turning and twisting the cable as they pass from one to the other of said paths of travel.

9. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and downleading path of travel for the cars, and a series of attachments carried by said endless draft device having car-engaging elements each adapted to extend normally upward from the draft device along both its paths of travel, of guide-sheaves for directing said endless draft device from one path to the other, each of said sheaves having a series of recesses around its periphery adapted to receive said attachments on the draft device, and a series of guides arranged at said recesses and adapted to engage and support said attachments and to prevent their turning and twisting the draft device as it is deflected from one to the other of said paths of travel.

10. For a car-haul system having a single endless draft device arranged to travel around a circuit having an upleading and a downward-leading path of travel for the cars and carrying car-engaging elements adapted to be maintained normally above the said draft device along both of its paths of travel, a sheave for deflecting the course of travel of said endless draft device having a series of recesses arranged to receive the car-engaging elements on said draft device, and a series of guides arranged at said recesses and adapted to engage the said car-engaging elements and to prevent their turning and twisting the flexible draft device as it is deflected in its course of travel by the sheave.

11. A sheave for directing the course of travel in a car-haul system of the endless draft device with a series of car-engaging ele-

ments thereon, said sheave having a series of recesses arranged to receive the car-engaging elements on the said draft device and a series of guides arranged at said recesses and adapted to engage the said car-engaging elements and to prevent their turning and twisting the endless draft device as its course of travel is deflected by the said sheave.

12. A sheave for directing the course of travel in a car-haul system of an endless draft device having a series of car-engaging elements thereon, said sheave having a series of recesses about its periphery arranged to receive the car-engaging elements on said endless draft device, and a series of guide-plates each arranged at one of said recesses on the under side thereof and adapted to engage the car-engaging elements on the said endless draft device and to prevent their turning and twisting the cable while their course of travel is being deflected.

13. A sheave for directing the course of travel in a car-haul system of an endless draft device having a series of car-engaging elements thereon, said sheave having a series of recesses about its periphery adapted to receive the car-engaging elements on said endless draft device, and guides arranged at either side of and longitudinally of each of said recesses and adapted to engage the said car-engaging elements at either side thereof while they are on the sheave and their course of travel is being deflected, in order to prevent their turning and twisting the cable.

14. In a car-haul system, the combination with an endless draft device arranged to travel around a circuit having an upleading and a downleading pathway for the cars, and a series of cable-trucks carried by said endless draft device and having car-engaging elements normally extending upward therefrom along both of said paths of travel, of guide-sheaves for deflecting the course of travel of said endless draft device from one to the other of said pathways, each sheave having a series of recesses adapted to receive said cable-trucks, and a series of guide-plates adapted to engage with said trucks and prevent their turning and twisting the cable while the course of the endless draft device is being deflected.

15. In a car-haul system, the combination of an endless draft device, supporting and guiding devices for said endless draft device arranged to deflect and direct it from one to the other of its paths of travel, a cable attachment secured to said draft device, and means arranged to engage with and travel with said cable attachment while it is being deflected from one of said paths of travel to the other to prevent it from turning and twisting the cable.

16. In a car-haul system, the combination of an endless draft device, supporting and

guiding devices for said endless draft device,
a cable attachment secured to said draft de-
vice and having an arm adapted to be main-
tained in upright position to engage a car
5 while moving along the paths of travel of
said draft device, and means arranged to en-
gage with and travel with said cable attach-
ment while it is being deflected from one of

its paths of travel to the next to prevent it
from turning and twisting the cable.

In testimony whereof I affix my signature
in presence of two witnesses.

CHARLES W. MILLER.

Witnesses:

FRANK H. CHURCH,
S. J. WHITE.