Nov. 20, 1928. 1,692,142

J. B. STRAUSS

BARRIER

Filed Nov. 28, 1921 3 Sheets-Sheet 1

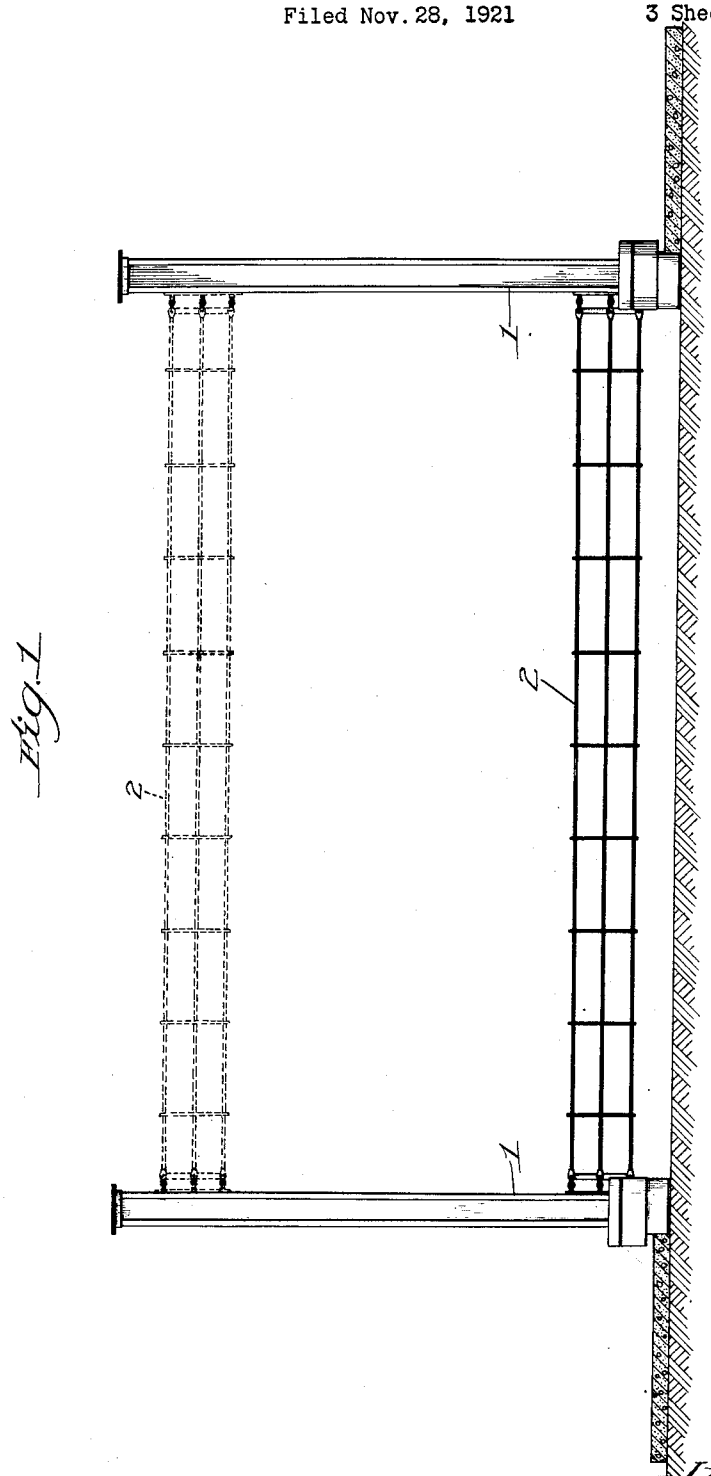


Fig. 1

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Nov. 20, 1928. 1,692,142

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Filed Nov. 28, 1921 3 Sheets-Sheet 2

Fig. 2

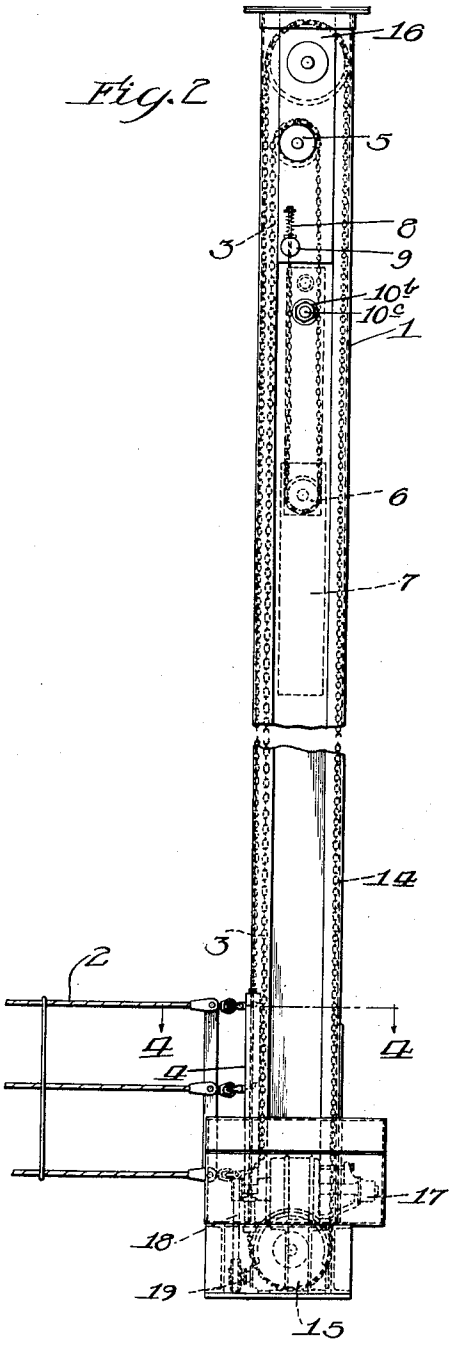
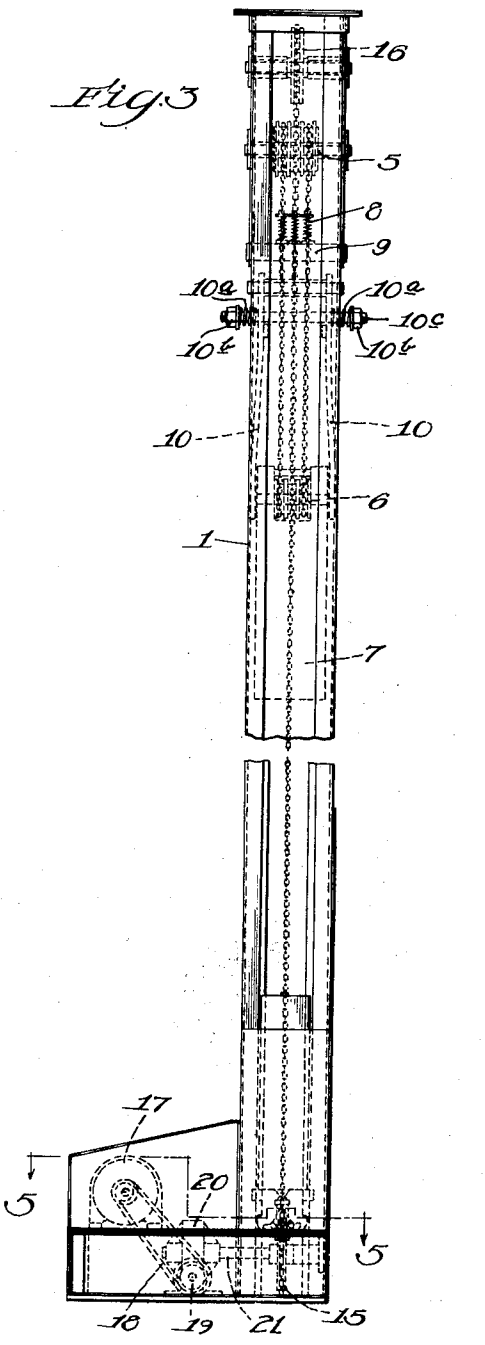


Fig. 3



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Filed Nov. 28, 1921 3 Sheets-Sheet 3

Fig. 4

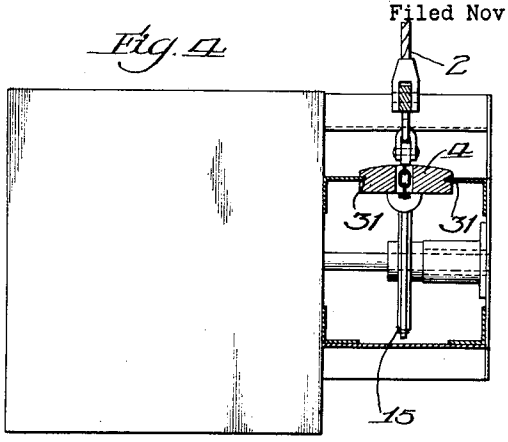


Fig. 5

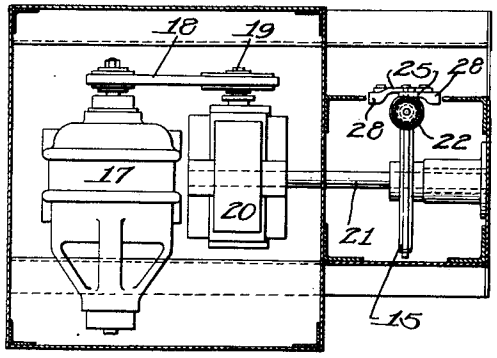


Fig. 6

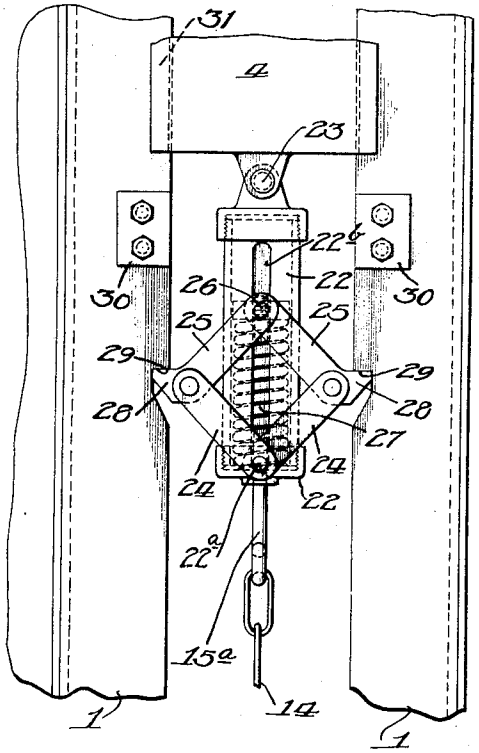
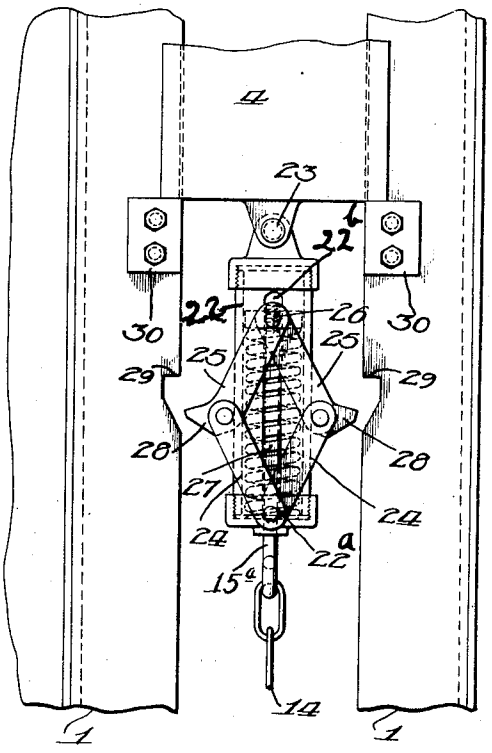


Fig. 7



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Patented Nov. 20, 1928. 1,692,142

UNITED STATES PATENT OFFICE.

JOSEPH B. STRAUSS, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIGHWAY SAFETY BARRIER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BARRIER.

Application filed November 28, 1921. Serial No. 518,133.

This invention relates to a barrier, and has for its object to provide a new and improved device of this description, particularly adapted to be extended across a roadway to stop automobiles or other vehicles. The invention has among other objects to provide a device of this description wherein the part which extends across the roadway may be lifted and lowered, and means for relieving the strain on the lifting and lowering mechanism when the said part is struck by a vehicle. The invention has other objects which are more specifically pointed out in the following description.

Referring now to the drawings

Fig. 1 is a front view showing one form of device embodying the invention;

Fig. 2 is an enlarged front view of one of the posts at one side of the roadway showing the mechanism therein;

Fig. 3 is a side view of the post shown in Fig. 2 showing the mechanism therein;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken on line 5—5 of Fig. 3;

Fig. 6 is an enlarged view showing the mechanism for relieving the strains from the lifting mechanism for the portion of the barrier extending across the roadway when such portion has been struck by a vehicle;

Fig. 7 is a view similar to Fig. 6 when the parts are in their normal inoperative position;

Like numerals refer to like parts throughout the several figures.

Referring to the accompanying drawings I have shown two fixed supports 1 on opposite sides of the roadway. These fixed supports may be of any suitable construction, and carry and support the controlling mechanism of the barrier. An impact receiving part 2 extends across between the supports 1. This is preferably made of flexible pieces connected together, and is normally in an inoperative position above the roadway as shown in dotted lines in Fig. 1, and is moved down across the roadway to the position shown in full lines in Fig. 1 when it is desired to stop the vehicle.

Means are provided for permitting the impact receiving device to move forward with the vehicle when struck. In the construction shown this result is secured by connecting with the ends of the impact receiving device, 2, the flexible power transmitting devices 3. In the construction shown there are three of these power transmitting devices, one connected near the top, and one near the bottom, and one near the middle of the impact receiving part 2. These flexible power transmitting devices 3 pass through openings in a rigid part or spacer 4, which keeps them properly spaced or positioned. The parts 3 pass up over a direction changing device 5, and then over a pulley or direction changing device 6 connected with a movable weight 7, and the ends thereof are connected through springs 8 with fixed parts 9, so that when the impact receiving device is moved forward by the vehicle, the weight 7 will be lifted. This weight when lifted passes between the friction engaging devices 10, which gradually stop it and thus gradually stop the vehicle after the weight has reduced its speed. The part or spacer 4 is arranged so that it may be lifted or lowered so as to move the impact receiving device into an operative or inoperative position. In the construction shown this movement is secured by means of the power transmitting device 14, which passes around the direction changing device 15 at the bottom, and the direction changing device 16 at the top of the support 1, and is connected with the spacer 4 so as to form as it were an endless flexible power transmitting device. The device may be operated by hand or by means of an electric motor 17, which is connected by a belt 18 with a pulley on a shaft 19. This shaft has a worm which engages a worm gear 20 on a shaft 21, carrying the pulley 15, so as to drive this pulley.

The direction changing devices 15 and 16 as shown are toothed wheels, around which the power transmitting device 14 passes, which in this instance is a chain, so that when the toothed wheel 15 is driven in one direction, the power transmitting device 14 will be moved to move the impact receiving part 2 up to its inoperative position, and when rotated in the opposite direction, moves the impact receiving part 2 down to its operative position. When the vehicle strikes the impact receiving part 2 there will ordinarily be a great strain put upon the power transmitting device 14, and hence, unless made very strong, injury may result.

In the present construction I provide means for automatically removing the strain from the part 15 when the vehicle strikes the part

2. This is accomplished by transferring the strain to the support 1. In Figs. 6 and 7 I have shown in detail a particular construction for this purpose. In this construction there is connected in the endless chain, a device which automatically engages the support 1. In the construction shown in Figs. 6 and 7 this device comprises a part 22 connected in the endless chain, and which as herein shown is pivotally conected at 23 with the spacer 4.

Pivotally connected to the part 22 at 22^a are the links 24, which are pivotally connected to the links 25. The links 25 are connected to the other part of the endless chain in any suitable manner. As herein shown there is a rod 15^a connected with the part 14, and this rod passes up through a hole in the bottom of the part 22, and is connected by the pin 26 with the upper ends of the links 25. There is a spring 27 which is also connected with the upper ends of these links so as to normally hold them in their expanded position, as shown in Fig. 7. The part 22 is provided with the slot 22^b along which the pivot 26 moves when the spring 27 is compressed or expanded. The links 25 are provided with engaging parts 28 which engage the engaging parts 29 on the supports 1. These supports are provided with stops 30, which limit the downward movement of the spacers 4 when the impact receiving part is down across the roadway. When the parts are in this position the device for relieving the strain on the endless chain 14 and for directly connecting the impact receiving device with the supports, is in a position where the engaging parts 28 are below the engaging parts 29 on the supports. The spacers 4 are arranged to easily slide up and down along the supports, and are connected with the supports so as to take the lateral strains. This result is secured in any desired manner. As herein shown the spacers are provided with grooves into which project guides 31 connected with the supports, the construction being made strong enough to stand these lateral strains. The mechanism of the two supports are similar.

When the impact receiving device is struck by a vehicle, the impact receiving part 2 moves forward with the vehicle, and the power transmitting devices 3 pay out through the holes in the spacers. This pulls the weight 7 upwardly, which weight resists the forward movement of the vehicle. The weights pass between the friction devices 10 which exert a friction on the weight, which increases as the weight moves upwardly, and this further retards the movement of the vehicle, and the vehicle is therefore gradually stopped. The increase of the friction is brought about by the fact that the parts 10 are nearer together at their upper ends than at their lower ends, and by the further fact that there are springs 10^a which resist the outward movement of the parts 10 with an increasing resistance. These springs make the device more elastic and pliable. They also permit adjustment as there are nuts 10^b which may be adjusted to adjust the tension of the springs. The springs as shown are located on a rod 10^c, which passes through the parts 10, which has threaded ends for the nuts 10^b. The parts 10 may be of spring metal, but when the springs 10^a are used, this is not necessary. When the vehicle strikes the impact receiving part there is an up-lift which tends to move the spacers upwardly. Since, however, the worm and worm gear driving connection prevent the movement of the chain 14, this upward movement causes the links 24 and 25 and the pivots 22^a and 26 to be moved relatively, towards each other, and this causes the engaging parts 28 to be thrust outwardly and to be brought into engagement with the engaging parts 29 on the supports, as shown in Fig. 6. The stress is therefore removed from the chains or power transmitting devices 14, and transferred to the supports, and hence the danger of breakage of the power transmitting devices 14 is eliminated.

When the pressure on the impact receiving device is released, the spacers move back to their original position, and the engaging parts 28 are released from the engaging parts 29, and the spacers and impact receiving device may be moved up out of the way by the motor 17. It will thus be seen that I have here means for automatically releasing the strain on the control mechanism for the impact receiving device, and for transferring this strain directly to the supports, thereby preventing injury of this controlling mechanism.

I have described in detail a particular construction embodying the invention, but it is of course evident that the parts may be varied in many particulars, without departing from the spirit of the invention as set forth in the claims hereto attached, and I therefore do not limit myself to the particular construction shown.

I claim:

1. A barrier for vehicles comprising separated supports, an impact receiving device comprising a plurality of flexible parts extending across the space between said supports, spacers adapted to slide along said supports and with which said impact receiving device is movably connected, power transmitting devices connected with said spacers and extending along the supports, means for applying power to the power transmitting devices to raise and lower said spacers and said impact receiving device, automatically actuated devices connected with said power transmitting devices for connecting the power transmitting devices and said spacers with said supports when the impact receiving device is struck so as to relieve the strain on said power transmitting devices.

2. A barrier for vehicles comprising separated supports, a flexible impact receiving device extending across the space between said supports, a movable device mounted on each support with which said impact receving device is movably connected, flexible power transmitting devices connected with each movable device for raising and lowering it, and automatic holding devices interposed between the movable devices and the flexible power transmitting devices for automatically connecting the movable devices with the supports when the barrier is struck, so as to relieve the strain from said power transmitting devices.

3. A barrier for vehicles comprising separated supports, a flexible impact receiving device extending across the space between said supports, a movable device mounted on each support with which said impact receiving device is movably connected, flexible power transmitting devices connected with each movable device for raising and lowering it and holding devices interposed between the movable devices and the flexible power transmitting devices and forming continuations of the flexible power transmitting devices comprising movable engaging parts actuated by the pull on the flexible power transmitting devices, and fixed engaging parts with which they are brought into engagement to relieve the strain on the power transmitting device when the power transmitting device is struck by a vehicle.

4. A barrier for vehicles comprising separated supports, a flexible impact receiving device extending across the space between said supports, a movable device mounted on each support with which said impact receiving device is movably connected, flexible power transmitting devices connected with each movable device for raising and lowering it, and holding devices interposed between the movable devices and the flexible power transmitting devices comprising a part connected with the movable device, links pivoted to said part, a second set of links pivotally connected to the end of the power transmitting device so that when pressure is applied thereto the pivoted ends of the links will be moved towards each other, engaging parts on one set of links, fixed engaging parts on said supports engaged by the engaging parts on the links when the pivoted ends of the links are moved towards each other, so as to connect the power transmitting device with the support.

Signed at Chicago county of Cook and State of Illinois, this 14th day of November, 1921.

JOSEPH B. STRAUSS.