(No Model.) 4 Sheets—Sheet 1.

J. M. PHILLIPS, J. J. FLEMING & F. BROWNING.

AUTOMATIC CROSS-OVER TIP.

No. 524,211. Patented Aug. 7, 1894.

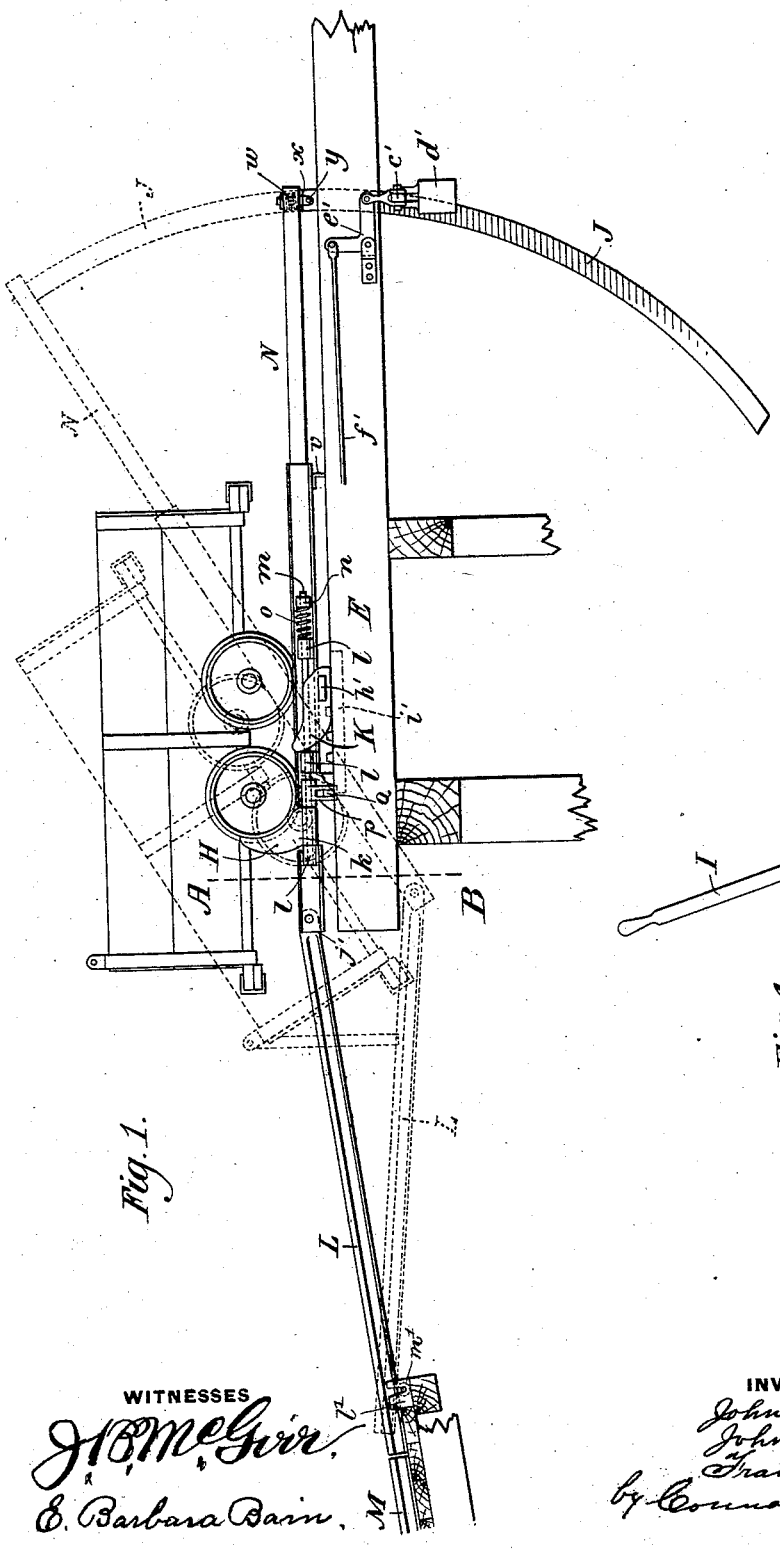

Fig. 1.

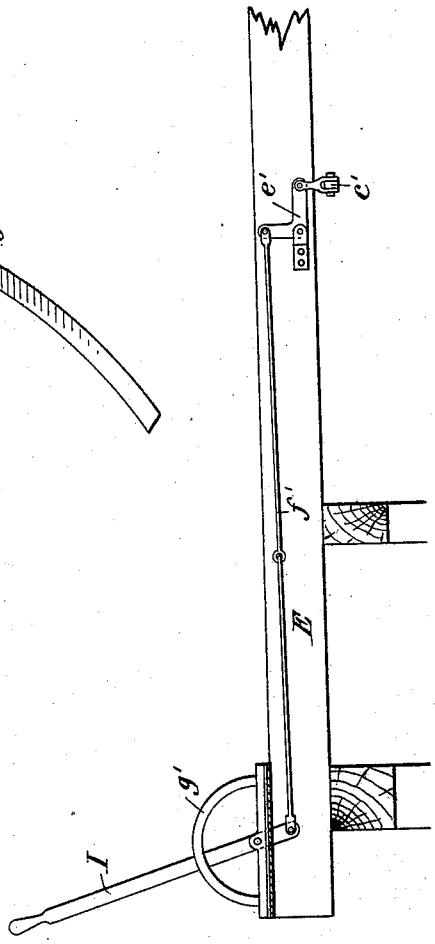

Fig. 4.

WITNESSES

J. B. McGirr.

E. Barbara Bain.

INVENTORS

John M. Phillips

John J. Fleming

Frank Browning

by Connolly Bro. Atty's

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J. M. PHILLIPS, J. J. FLEMING & F. BROWNING.

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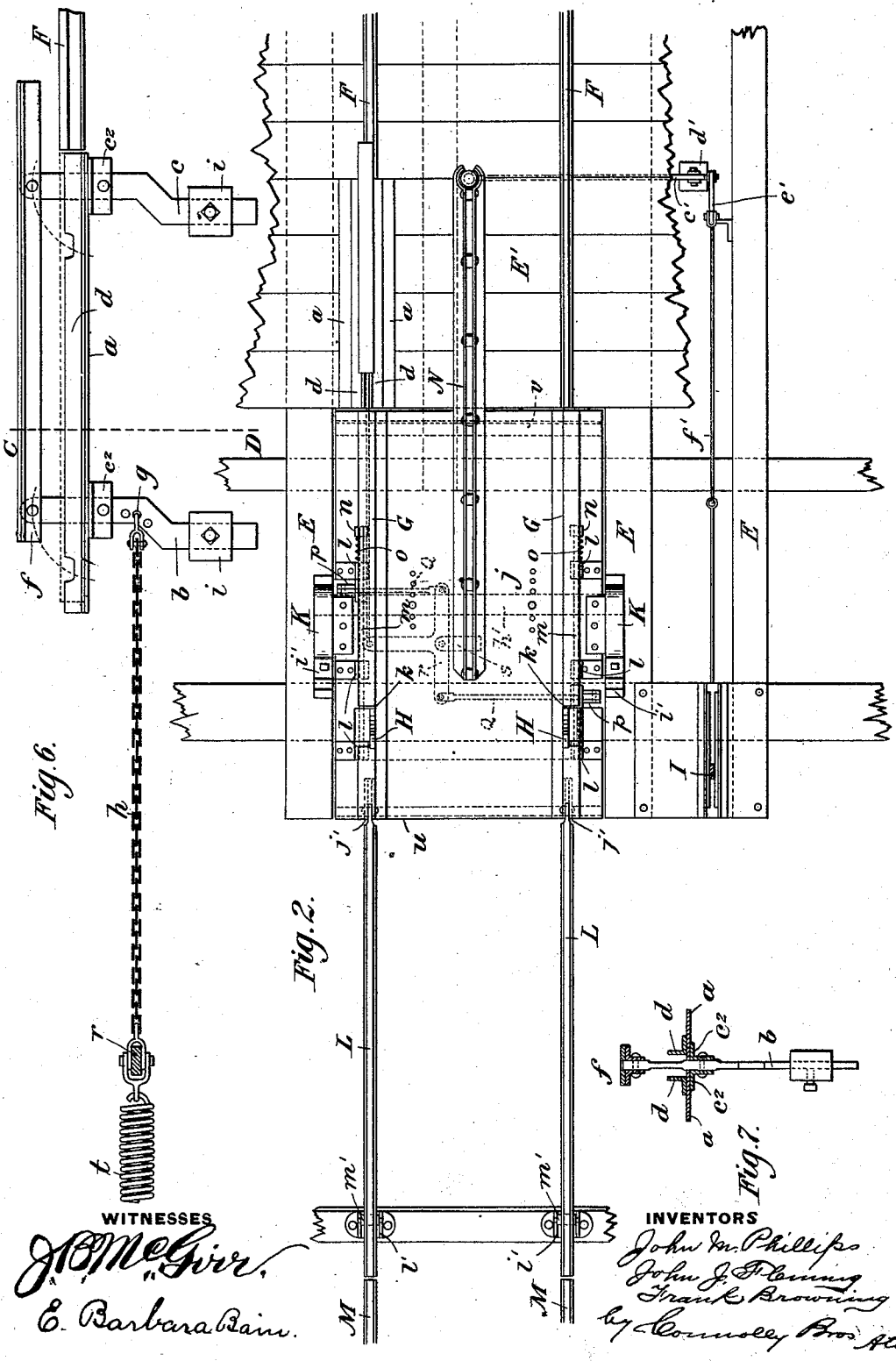

Fig. 6.

Fig. 2.

Fig. 7.

WITNESSES

J. B. McGirr.

E. Barbara Bain.

INVENTORS

John M. Phillips

John J. Fleming

Frank Browning

by Connolly Bros. Atty's

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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AUTOMATIC CROSS-OVER TIP.

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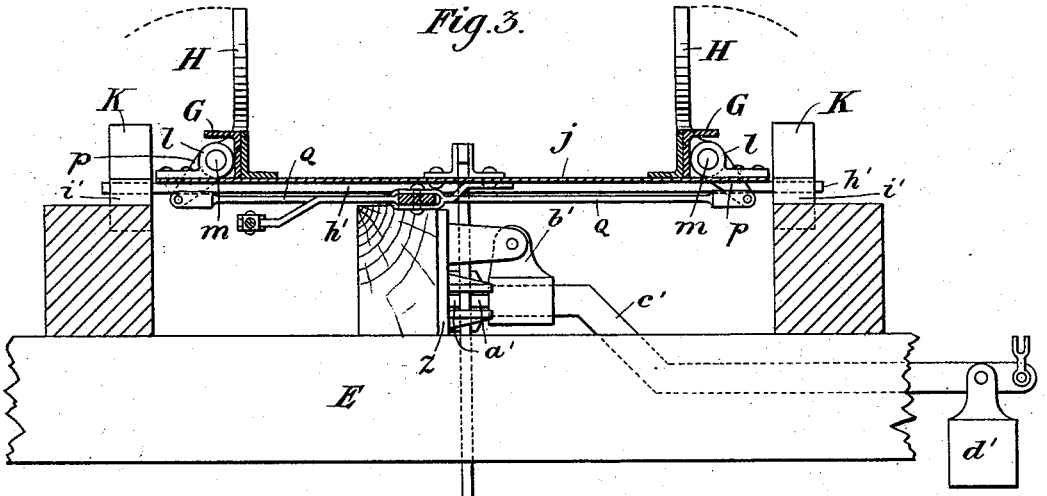
Fig. 3.



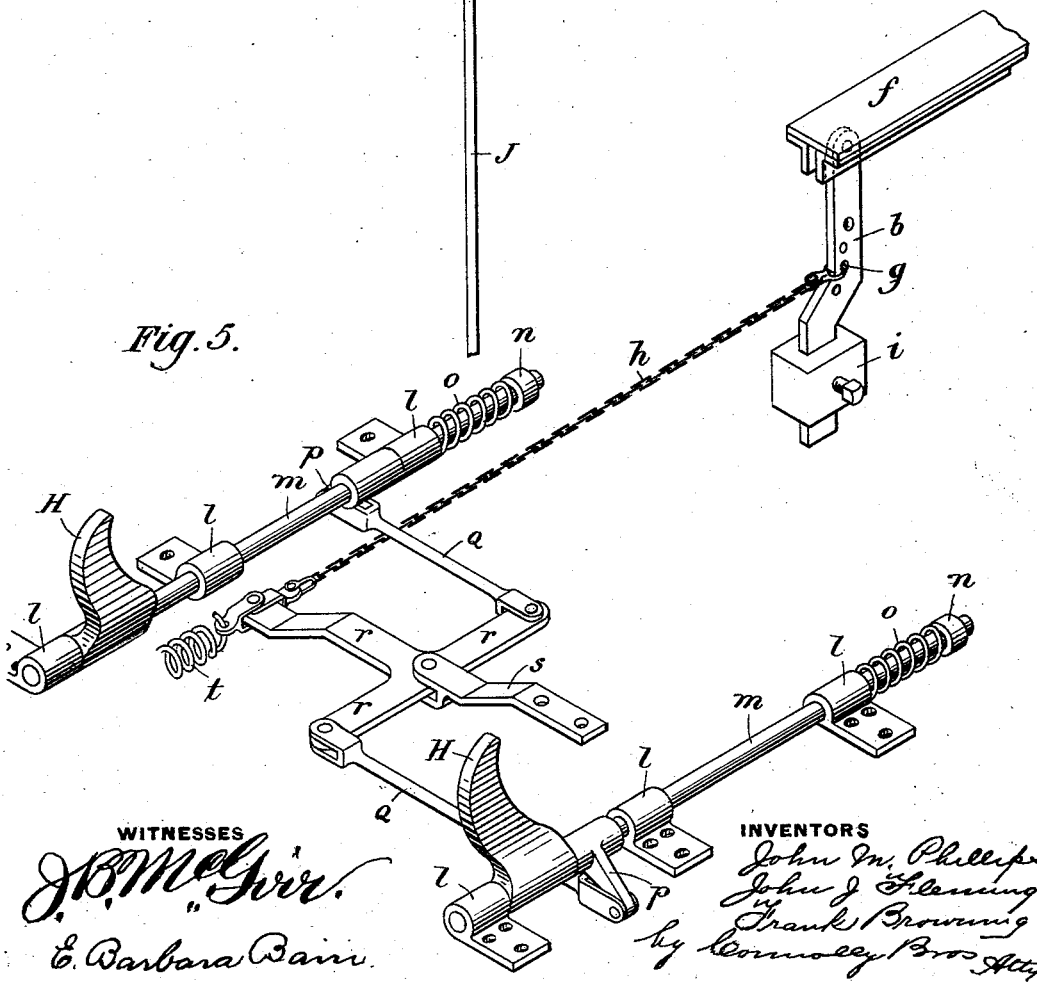


Fig. 5.

WITNESSES

J. B. McGirr.

E. Barbara Bain.

INVENTORS

John M. Phillips

John J. Fleming

Frank Browning

by Connolly Bro Att'ys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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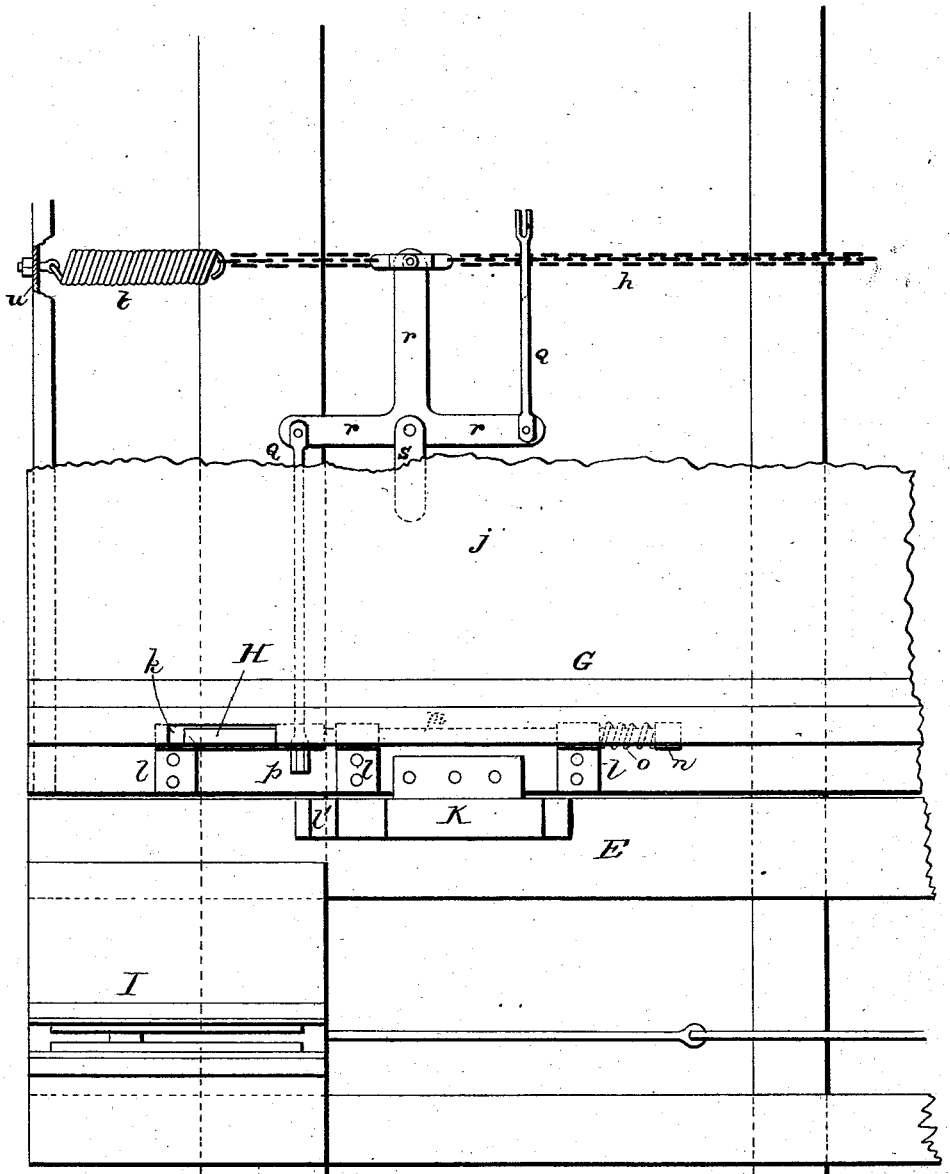

Fig. 8

Witnesses
J. B. McGinn.
Wm. McCarthy.

Inventors
John M. Phillips
John J. Fleming
Frank Browning
by Connolly Bro.
Atty's

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN M. PHILLIPS, OF CARRICK, JOHN J. FLEMING, OF FLEMING PARK, AND FRANK BROWNING, OF CORAOPOLIS, PENNSYLVANIA; SAID FLEMING AND BROWNING ASSIGNORS TO SAID PHILLIPS.

AUTOMATIC CROSS-OVER TIP.

SPECIFICATION forming part of Letters Patent No. 524,211, dated August 7, 1894.

Application filed February 24, 1894. Serial No. 501,403. (No model.)

To all whom it may concern:

Be it known that we, JOHN M. PHILLIPS, residing at Carrick, Baldwin township, JOHN J. FLEMING, residing at Fleming Park, and FRANK BROWNING, residing at Coraopolis, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented certain new and useful Improvements in Automatic Cross-Over Car-Tips; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a cross-over car tip or dumping apparatus, for the rapid and economical handling of cars at mines, in which the loaded car passing on to the tip or tilting track section of the apparatus is stopped by the horns, the tip being released, dumps the car, the contents thereof being discharged between and below the track rails, the tip automatically coming back to first position. The next loaded car as it comes to the tip, automatically opens the horns, thereby releasing the empty car, which passes forward off the tip and the horns spring back to the first position to catch the next approaching loaded car. Said movements of cars loaded and empty are caused by gravity effected by a proper arrangement of tracks and switch.

To bring about the above operations, the invention consists of, and comprehends a novel construction, arrangement and combination of parts hereinafter fully described, illustrated and claimed.

In the accompanying drawings, Figure 1 is a side elevation, partly in section of the tip in its first position with the car thereon, the dotted lines showing the tip in its second position dumping the car, the horn spreader, however, not being shown in dotted lines. Fig. 2 is a top plan view of the tip, showing the parts in the same position they occupy in Fig. 1, the car however, being removed. Fig. 3 is a detailed transverse sectional view, on line A—B of Fig. 1. Fig. 4 is a side elevation showing brake lever. Fig. 5 is a detail in perspective of the horn mechanism. Fig. 6 is a side elevation of the automatic horn spreader. Fig. 7 is a sectional view of the automatic horn spreader on line C—D of Fig. 6. Fig. 8 is a plan view partly in section of a portion of the tilting track section or tip.

Referring to the accompanying drawings, E represents timbers of the usual type which support the tip. E′ the floor, secured to these timbers, upon which are secured the main stationary track rails F, leading the cars from the mine to the tip. The loaded car moving on the stationary track from the mine to the tip, strikes the horn spreader placed on said track at any desirable point, pushing it forward and down, thus passing over it on to the tip. Upon the tip are located horns H for the purpose of stopping the car at the desired point on the tip preparatory to dumping. The horns H are connected to rock shafts which are journaled in boxes 1 on the movable track section and these shafts are caused to rock or partially revolve by mechanism hereinafter to be more fully described and designated generally as the "horn spreader." The horn spreader is located wholly on the tilting track section while its actuating mechanism, preferably a depressible tread rail and adjuncts, is located upon the stationary track section, the tread rail mechanism being connected to the horn spreader by a chain, so that as the loaded car passes over and depresses the tread rail, the horns will be spread apart by the horn spreader.

The track on the tip is formed of steel angle rails G, upon which the car moves until stopped by the horns H. The brake handle I, is then pulled back by the operator, releasing the brake bar J, from the bite of the brake shoes a', by which said brake bar is held as will be hereinafter more fully described, which operation causes the tip to rock forward and down upon the tip shoes K, to the position shown by the dotted lines in Fig. 1. The brake is then applied to hold the car in tilting position, until the contents are all discharged. The brake then being released, and the tip being so balanced within

itself, returns with the empty car to its first position, the brake locking automatically, to hold the tip for the coming loaded car. The next loaded car moving by gravity toward tip, operates the horn spreader, causing the horns to roll outwardly and release the empty car.

The grade of the tip is such as to allow the empty car to move forward off the tip by gravity, without being pushed by the loaded car, and at the instant the rear wheels of the loaded car clear the tread rail of the horn spreader, the empty car has passed the horns, which right themselves in readiness to catch the approaching loaded car. The empty car passes from the tip across the hinged sliding rails L, to the permanent track M, where by a combination of grades and return spring switch, it is run back to the mine on a track parallel to the stationary track F.

Having thus described the working of the detail parts in combination and arrangement, the following is a description of the mechanical details.

Referring to Fig. 2 of drawings, a section of one of the main stationary rails is cut out at any preferable distance from the tip to accommodate the tread rail of the horn spreader, which forms a continuation of one of said rails. The base plate *a* of the horn spreader, which is slotted to accommodate the movements of the upright pivoted arms *b c*, is securely fastened to the floor E′. Riveted to the top of said base plate are the angle bars *d*. To the bottom of the base plate *a*, are riveted the angle clips c^2, in which are pivotally secured the arms *b c*. Pivotally secured to the upper ends of the bars *b c* is the tread rail *f*, which is designed to register with the angle bars *d*, to form a section of the stationary rails F. Secured to the upright bar *b* at *g* is the drawing chain *h*. To the lower end of the bar *c*, is attached the slotted counter-weight *i*.

It will readily be seen from the above description, that as the loaded car comes from the mine, the tread of the front wheel pushes the tread rail *f*, forward and down until it registers with the angles *d*. As the rear wheels of the car pass the tread rail, the counter-weight *i*, and the retractile spring *t*, to be hereinafter described, bring the horn spreader into first position.

The base of the tip proper is a heavy steel plate *j* (see Fig. 2), the purpose of which is to insure foundation of absolute rigidity, to which is attached the track rails, tip shoes, sliding rails, rolling horns, and brake mechanism. Securely riveted to the top of the said base plates are the angle track rails G which are formed of two angles, which are also riveted together. These track rails are only long enough from the horns back to accommodate one car, the idea being to make the tip as short and compact as possible. The shortening of the tip would not be possible if it were not for our placing the actuating mechanism of the horn spreader on the main track. The top angles are cut away as shown at *k*, to allow the horns H when in their upright position, to engage the tread of the front car wheels, close to the flanges of same. Riveted to the base plate *j*, are the horn journal boxes *l*, in which are pivoted the horn shafts *m*. Securely welded to these shafts are the horns H. On the ends of said shafts are the collars *n* secured by keys. On the shafts between the collars and the next journal boxes, as clearly shown in Fig. 5, are spiral springs *o*, designed to take up the jar caused by the loaded car striking the horns, the slots *k* being long enough to allow a slight forward movement of the horns. Securely keyed to the shafts *m* are the crank levers *p*, the plate *j* being slotted to allow the necessary movement of said cranks. To the lower ends of above cranks are pivotally secured the jaw rods Q, the other ends of said jaw rods being pivotally connected to the T crank *r*, which is pivotally secured to the base plate *j* by a bolt through the clip *s*, which is riveted to the base plate. To the third arm or stem of the T crank *r*, is attached one end of the spiral, retractile spring *t*. The other end of said spring is secured to the angle *u*, which is riveted to the forward end of the base plate to strengthen same. Attached to this same stem of the T crank *r*, but on the opposite side, is the spreading chain *h*.

From the above description it will be readily seen that as the loaded car coming from the mine pushes the tread rail *f* of the horn spreader forward and down into alignment with the main track rails, as shown by the dotted lines in Fig. 6, the chain *h* draws the stem of the T crank *r* toward the horn spreader, thereby drawing the jaw rods Q inwardly, and thus rolling the horn shafts in their journal boxes and spreading the horns H outwardly from in front of the wheels of the empty car. When the empty car has cleared the horns, and the loaded car has passed the tread rail of the horn spreader, the retractile spring *t* immediately brings the horns back and securely holds them in their upright position to catch the loaded car.

Riveted to the bottom of the base plate *j* is an angle stiffener *v*. Securely riveted on the top of said base plate *j* and through the angle *v* are two steel angles which are also riveted together with fillers between, which together form the brake tongue N. Upon the free end of said tongue is placed, as clearly shown, a spiral spring *w*, resting on a plate *x*, riveted to the bottom of said tongue. Depending from a washer placed on top of said spiral spring, and through the spring and base plate, is an eye bolt *y*, to which is pivotally hung the brake bar J, said spiral spring being so

placed to take up the jar caused by any sudden application of the brake. The construction of tongue N is also such as to make a compensating spring for the same purpose. The brake appliances for gripping said brake are of the usual character, and are clearly shown in Figs. 1, 2 and 3. Securely bolted to an intermediate timber is the base plate z, which is provided with six auxiliary projecting arms, the lower four of which form two opposite side slots, in which work the brake shoes a', between which passes the brake bar J. The inside shoe is designed to take the wear off the base plate. Between the upper two arms of said base plate pivotally depends the cast fulcrum b', in which is securely inserted the lever c'. Depending from the outward end of said lever is the cast weight d' which tends to compress the brake lever between the shoes, thereby gripping the brake and locking the tip in any position. To raise the lever c', and release the brake, we employ a bell-crank e', drawing rods f', brake lever I, and the guard g' as clearly shown in Fig. 4. The brake locks automatically.

Referring to Fig. 2, the adjustable tip bar h', is bolted to the bottom of plate j. The ends of said bar project beyond said plate, and are securely inserted in and bolted to the tip shoes K. Means for moving said bar forward or backward to adjust the tip to handle cars of various weights and wheel bases, are provided by a series of holes in said plate j, as clearly shown. Securely bolted to the timbers E, are the shoe bases i', which are provided with cogs which mesh with recesses in the tip shoes K as they rock forward in tipping the car. When said tip shoes are at rest, and the tip in its first position, the line of gravity of the tip and loaded car is forward of the point of contact of the tip shoe on the base plate. As the tip rocks forward and down on the tip shoes, thereby dumping the loaded car, the center of gravity moves back of the then point of contact, so that the tip with the empty car rights itself automatically.

At the forward end of the angle track rails G, said rails are separated and forged to form slots j', in which are securely hinged by means of bolts, the sliding rails L, on which the empty car crosses over the dump hole to the permanent track M. The free ends of said rails are held in gage and alignment with the track by the boxes l' which are provided with friction rollers m', on which the said rails slide to accommodate the downward motion of the tip.

Having described our invention, we claim—

1. In a car tipping or dumping apparatus, the combination with the stationary track section and the platform upon which is arranged the tip or tilting track section, of the horn stops connected to said tip or tilting track section, the actuating mechanism of the horn spreader located on the stationary track section back of and apart from said tip or tilting track section, and suitable intermediate mechanism for operating said horn stops through the depression of said horn spreader.

2. In a car tipping or dumping apparatus, the combination with the tilting track section mounted on the tip platform, of horn stops mounted on horizontal rocking shafts arranged parallel with rails substantially as described.

3. In a car tipping or dumping apparatus, the combination with the tilting track section, of horizontal shafts, and buffer springs arranged and adapted to receive the longitudinal thrust of said shafts, and horn stops mounted on said shafts substantially as described.

4. In a car tilting or dumping apparatus, the combination with the tip platform, of the tip or tilting track section composed of a base plate and angle iron tracks or rails, and the horizontal shafts located under the tread of said rails and carrying horn stops substantially as described.

5. In a car tipping or dumping apparatus, the combination with the horizontal rocking shafts, arranged parallel to the rails and horn stops mounted on said shafts of mechanism for rocking said shafts so as to spread the horn stops, and a spring to restore said horn stops to normal position, substantially as described.

6. In a car tipping or dumping apparatus, the combination with a tilting track section mounted on the tip platform, of the angle tongue situated between the rails and secured to the tip platform, said angle tongue extending rearwardly of the tip platform and combined with the arc shaped brake plate, and brake mechanism substantially as described.

7. In a car tipping or dumping apparatus, the combination with the rearwardly extending angle tongue, and the brake mechanism of the arc shaped brake plate pivotally secured to said angle tongue, and the interposed spring connection, substantially as set forth.

8. In a car tilting or dumping apparatus, the combination with the tip or tilting track section and the horn stops located thereon, of the actuating mechanism of the horn spreader, located off the tilting track section, and connected by suitable operative mechanism to the horn stops, said actuating mechanism consisting of a depressible counterbalanced structure, operable by a passing loaded car, substantially as described.

9. In a car tilting or dumping apparatus, the combination with a tilting track section, horizontal rock shafts pivoted thereon, and horn stops mounted on said shafts, of levers

secured to said rock shafts, a horizontally pivoted T lever connected to the rock shaft levers, and a horn spreader actuating mechanism connected to said T lever, substantially as described.

10. In a car tipping or dumping apparatus, the laterally rocking horn stops combined with and arranged on horizontal axes, substantially as described.

11. In a car tipping or dumping apparatus, the actuating mechanism of the horn spreader located back of and separated from the tip, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JNO. M. PHILLIPS.
JOHN J. FLEMING.
FRANK BROWNING.

Witnesses:
J. BOYD DUFF,
JAMES H. HOMER.