

ing abutments, and connected with means for drawing in one chain and loosening the other simultaneously, the spring being suitably connected with the bolt  $E^2$  having semispherical bearing  $E^{12}$ , rotating against the curved bearings in the saddle or projection, the recess in said saddle through which the bolt passes being enlarged rearwardly, substantially as and for the purpose specified. 27th. In a traction engine having front axle, capable of being turned on a pivot connected to the frame of the machine, and chains connected respectively to the outer or end portions of the axle and converging rearwardly against the deflecting abutments, and connected with means for drawing in one chain and loosening the other simultaneously, the spring being suitably connected with the bolt  $E^2$ , having buttons or semispherical bearing  $E^{12}$ , rotating against the curved bearings in the axle saddle or projection, the recess in said saddle through which the bolt passes being enlarged rearwardly, the bolt  $E^2$  being provided with the head  $E^3$ , and the cylinder  $E^5$ , the said head lying within the cylinder  $E^5$ , and against the head  $E^4$ , of the latter, and the spring  $E^6$ , within the cylinder, and held in place by the cap  $E^9$ , and the draw bolt  $E^7$ , whose head  $E^8$ , is within the cylinder and against that end of the spring which is opposite to the one which bears against the cap  $E^9$ , the bolt  $E^7$  passing through the cap being provided with the hook  $E^{10}$ , for connection with the chain, substantially as and for the purposes specified. 28th. In a traction engine having front axle, capable of being turned on a pivot, connected to the frame of the machine, and chains connected respectively to the outer or end portions of the axle and converging rearwardly against the deflecting abutments, and connected with means for drawing in one chain and loosening the other simultaneously, the spring being suitably connected with the bolt  $E^2$ , having semispherical bearing  $E^{12}$ , rotating against the curved bearings in the axle saddle or projection, substantially as and for the purposes specified. 29th. In a traction engine having front axle, capable of being turned on a pivot connected to the frame of the machine, and chains connected respectively to the outer or end portions of the axle and converging rearwardly against the deflecting abutments, and connected with means for drawing in one chain and loosening the other simultaneously, the spring being suitably connected with the bolt  $E^2$ , having semispherical bearing  $E^{12}$ , rotating against the curved bearings in the axle saddle or projection, the recess in said saddle through which the bolt passes being enlarged rearwardly, substantially as and for the purposes specified. 30th. In a traction engine, the frame for supporting the machine and constituting the reaches between the front head or cross block and the rear axle, consisting of piping  $A^2$ ,  $A^3$ , forming the conduit, the piping at one end of the machine being connected by the conduit  $A^3$ , and the other end of the machine, one of the pipes  $A^2$ , being connected with the pipe  $A^6$ , connected in turn to the space between the jacket of the engine and the cylinder thereof, the adjacent end of the other pipe being connected by the auxiliary pipe  $A^4$ , to the pump, substantially as and for the purposes specified. 31st. In an engine, the crank or driving shaft  $F$ , carrying the expander  $F^2$ , fixed thereon, the expander having the opening  $F^3$ , in its outer portion, and the friction shell  $F^4$ , surrounding the expander and connected to the driving gear  $F^4$ , the shell and gear mounted loosely on the shaft, and the beveled expander key  $F^6$ , and expander lever  $F^7$ , arranged to be moved outwardly from the shaft by key  $F^6$ , and still farther separate the portions of the expander opposing each other at the slit or opening  $F^3$ , thereby increasing the diameter of the expander, substantially as and for the purposes specified. 32nd. In an engine, the crank or driving shaft  $F$ , the driving gear  $F^4$ , provided with the shell  $F^3$ , turning loosely on the shaft, and an expander  $F^2$ , fixed to the shaft and provided with a lever pivoted substantially at  $F^8$ , in connection with the slot  $F^9$ , of the expander for enabling the movements of the lever to increase the size of the expander, the free end of the lever carrying the adjustable set screw and reciprocating under and in contact with the set screw, and means for reciprocating the key, substantially as and for the purposes specified. 33rd. In an engine, the crank or driving shaft  $F$ , the driving gear  $F^4$ , provided with the shell  $F^3$ , turning loosely on the shaft, and an expander  $F^2$ , fixed to the shaft and provided with a lever pivoted substantially at  $F^8$ , in connection with the slot  $F^9$ , of the expander for enabling the movements of the lever to increase the size of the expander, the free end of the lever carrying the adjustable set screw  $F^{10}$  and expander key  $F^6$ , in contact with the set screw and sliding in the groove  $F^{23}$  in the shaft and means for reciprocating the expander key, substantially as and for the purposes specified. 34th. In an engine, the crank or driving shaft  $F$ , the driving gear  $F^4$ , provided with the shell  $F^3$ , turning loosely on the shaft, and an expander  $F^2$ , fixed to the shaft and provided with a lever pivoted substantially at  $F^8$ , in connection with the slot  $F^9$ , of the expander for enabling the movements of the lever to increase the size of the expander, the free end of the lever carrying the adjustable set screw  $F^{10}$  and expander key  $F^6$ , in contact with the set screw and sliding in the groove  $F^{23}$  in the shaft, and means for reciprocating the expander key, and the shifter sleeve  $F^6$ , provided with abutments  $F^{12}$  and the forked lever  $F^{12}$ , operating between said abutments and pivoted at  $F^{14}$ , to the bracket  $F^{26}$  to the engine, substantially as and for the purposes specified. 35th. In an engine, the combination of the driving shaft  $F$  and driving gear  $F^4$ , pinions  $G$  and  $G^2$  meshing with the spur wheel  $G^3$ , mounted on the clutch gear shaft  $G^4$ , the said pinions and gear being located in the frame  $G^5$ ,  $G^6$ , oscillating on the said shaft  $G^4$ , and the nut  $G^9$  located in said frame

and screw  $G^8$ , passing through and engaging the nut  $G^9$  and journaled in the bracket  $G^{13}$ , substantially as and for the purposes specified. 36th. In an engine, the combination of the driving shaft  $F$  and driving gear  $F^4$ , pinions  $G$  and  $G^2$ , meshing with the spur wheel  $G^3$ , mounted on the clutch gear shaft  $G^4$ , the said pinions and gear being located in the frame  $G^5$ ,  $G^6$ , in the frame  $G^5$ ,  $G^6$ , said frame oscillating on the said shaft  $G^4$ , and the nut  $G^9$ , located in said frame, and the screw  $G^8$ , passing through and engaging the nut  $G^9$  and journaled in the bracket  $G^{13}$ , set screw rod being provided with the collar  $G^{14}$ , provided with the notch  $G^{19}$  and the lever  $G^{15}$ , pivoted at  $G^{17}$ , having the latch  $G^{18}$ , for engaging said notch  $G^{19}$ , and tail piece  $G^{20}$  and having the elastic spring set  $G^{21}$ , having a point provided with two beveled sides engaging the point  $G^{23}$ , on the bracket, which latter point also has two beveled sides, screw shaft having nut or detent  $G^{12}$ , preventing it from riding out of the bracket  $G^{13}$ , substantially as and for the purposes specified. 37th. In combination with the oscillating frame  $G^5$ ,  $G^6$ , pivoted on a shaft  $G^4$ , the spur gear  $G^3$  and pinions  $G^2$ , and driving gear  $F^4$ , mounted on its separate shaft, the screw  $G^8$ , working in the notch  $G^{19}$  in one portion of the oscillating frame  $G^5$ ,  $G^6$ , and mechanism for preventing the rotation of the rod except by human agency, to wit, lever  $G^{15}$ , pivoted at  $G^{17}$ , and having latch  $G^{18}$ , for engaging the notch  $G^{19}$  of the screw and tail piece  $G^{20}$ , spring set  $G^{21}$ , pressed down by means of the spring  $G^{27}$ , located in the chamber  $G^{26}$  of the lever, and the spring set being provided with the nut or detent  $G^{25}$  and at its free or operating end being alternately provided with two bevels for engagement with two bevels on the latch point of the bracket,  $G^{13}$ , substantially as and for the purposes specified. 38th. In combination with the oscillatory frame  $G^5$ ,  $G^6$ , carrying the gears in combination with the driving gear, the screw  $G^8$  arranged for oscillating the frame  $G^5$ , and passing through the bracket  $G^{12}$  and provided above the bracket with collar  $G^{14}$  and below the bracket with the nut or detent  $G^{15}$ , the passage through the bracket being enlarged from the center in both directions to allow the necessary oscillation of the groove as frame  $G^5$ ,  $G^6$ , oscillates, substantially as and for the purposes specified. 39th. In combination, the driving wheels, a shaft  $I$  for operating one of said driving wheels, and a sleeve  $I^2$  for operating the other of said wheels, the shaft being received into said sleeve, and the eye  $I^3$  located in the recess  $I^4$  of said sleeve, and surrounding the shaft  $I$ , the eye having a bolt  $I^5$  and a cap  $I^7$  over recess  $I^4$ , the bolt  $I^5$  passing through the cap and nut  $I^6$  thereof, substantially as and for the purposes specified. 40th. In the mechanism for enabling the driving wheels to rotate the one faster than the other, while both are positively driven, the combination of the driving wheels shaft  $I$  supported near one end in journal bearings  $B^8$  and pinion  $I^{20}$  fixed on said shaft  $I$  and internal gear  $BD$  on the adjacent driving wheel  $B^{17}$ , sleeve  $I^2$  loosely receiving the other end of the shaft and journaled in a bearing as  $B^8$ , a pinion  $I^8$ , fixed on said sleeve and engaging internal gear  $BD$ , and said internal gear located on the adjacent driving wheel  $B^{17}$ , a driving wheel positively driven by the engine and engaging a pinion  $I^{10}$  or  $I^{11}$ , said pinion being journaled on shaft  $I$ , and bevelled pinions  $I^{12}$  on opposite sides of hub of pinion  $I^{10}$  revolving loosely on shaft  $I$ , and the adjacent beveled gear  $I^9$  and  $I^{16}$  respectively engaging said pinion  $I^{12}$  on opposite sides thereof, one of these beveled gears being fixed to the shaft  $I$  and the other to the sleeve  $I^2$ , the sleeve  $I^2$  having a recess  $I^4$ , an eye  $I^3$  surrounding the shaft, and a bolt  $I^5$  connected to the eye and means for drawing the eye against the shaft  $I$ , substantially as and for the purposes specified. 41st. In the mechanism for stopping the  $K$ , fixed on shaft  $I$ , operating the driving wheels  $B^{17}$ , through suitable intermediate mechanism, and the brake band  $K^4$ ,  $K^5$ , attached at one end to the frame of the machine, and at the other end at  $K^7$ , to the nut  $K^3$ , nut  $K^{13}$ , and screw sleeve  $K^{16}$ , and screw rod  $K^{15}$ , screwing through the nut  $K^{13}$ , secured in the sleeve by the collars  $K^{17}$ , substantially as and for the purposes specified. 42nd. In the mechanism for stopping the machine, the brake wheel  $K$ , fixed on shaft  $I$ , operating the driving wheels  $B^{17}$ , through intermediate mechanism, and the brake band  $K^4$ ,  $K^5$ , attached at one end to the frame of the machine and at the other end at  $K^7$ , to the nut  $K^{13}$ , nut  $K^{16}$ , and screw sleeve  $K^{16}$ , and screw rod  $K^{15}$ , screwing through the nut  $K^{13}$ , secured in the sleeve by the collars  $K^{17}$ , substantially as and for the purposes specified. 43rd. In the mechanism for stopping the machine, the brake wheel  $K$ , fixed on shaft  $I$ , operating the driving wheels  $B^{17}$ , through intermediate mechanism, and the brake band  $K^4$ ,  $K^5$ , attached at one end to the flange  $B^{24}$ , of the axle cap, and at the other end at  $K^7$ , to the nut  $K^{13}$ , nut  $K^{16}$ , and screw sleeve  $K^{16}$ , and screw rod  $K^{15}$ , screwing through the nut  $K^{13}$ , secured in the sleeve by the collars  $K^{17}$ , substantially as and for the purposes specified. 44th. The combination of the shaft  $M$ , and the pulley  $M^6$ , friction shell connected to gear wheel meshing with gear on the crank shaft  $F$ , and an expander and expander key fixed to shaft  $M$ , and device for shifting the expander key, substantially as and for the purpose specified. 45th. In combination with the piping  $A^2$ ,  $A^3$ ,  $A^6$ ,  $A^3$ , and  $A^4$ , the caps  $P^2$ ,  $P^2$ , on said piping  $A^2$ ,  $A^2$ , and the buffer  $P$ , whose ends are connected to the said caps, substantially as and for the purposes specified. 46th. In combination with the piping  $A^2$ ,  $A^6$ ,  $A^2$ , and  $A^4$ , the caps  $P^2$ ,  $P^2$ , on said piping  $A^2$ ,  $A^2$ , and the buffer  $P$ , whose ends are connected to the said caps, and whose centre is provided with the concave piece  $P^3$ , centrally located therein, the buffer being of a box shape, substantially as and for the purposes specified.