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(54) Title: CONSTANT FORCE RAIL CLAMP

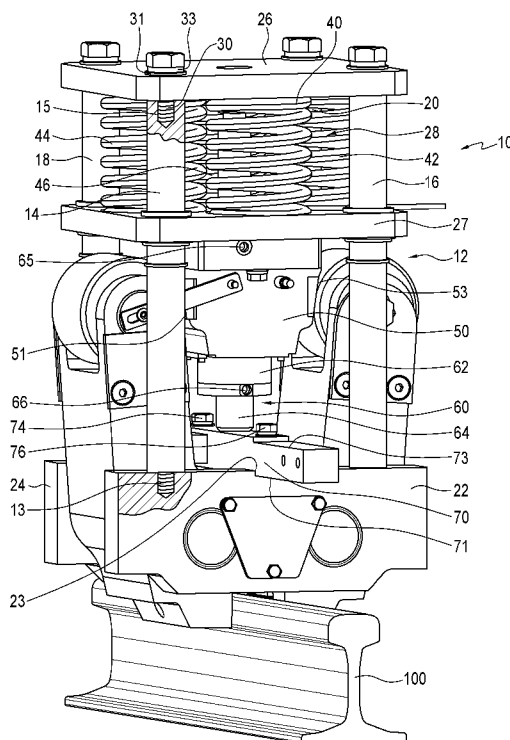


FIG. 1

(57) Abstract: A rail clamp comprises a frame and a pair of levers. Each of the levers has a brake pad at a first end thereof, a cam follower at second end thereof, and is mounted to the frame by a pivot disposed between said first and second ends. A cam is disposed between the levers and a spring biases the cam in a first direction. A clamp release actuator is operable to displace the cam in a second direction. The second direction is opposite to the first direction. A pair of variably sloped cam surfaces are disposed on opposite sides of the cam. Each of the variably sloped cam surfaces is in contact with the cam follower of a corresponding one of the levers, and each of the variably sloped cam surfaces has a slope which varies to counteract variations in a spring force of the spring as the cam is displaced, thereby maintaining a constant clamping force.



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1. A braking mechanism comprising:
 - 5 a frame;
 - a pair of levers, each of the levers having a brake pad at a first end thereof, a cam follower at second end thereof, and being mounted to the frame by a pivot disposed between said first and second ends;
 - 10 a cam disposed between the levers;
 - a spring biasing the cam in a first direction;
 - 15 a clamp release actuator operable to displace the cam in a second direction, the second direction being opposite to the first direction; and
 - a pair of variably sloped cam surfaces disposed on opposite sides of the cam, each of the variably sloped cam surfaces being in contact with the cam follower of a corresponding one of the levers, and each of the variably sloped cam surfaces having
20 a slope which varies to counteract variations in a spring force of the spring as the cam is displaced, thereby maintaining a constant braking force.
2. The braking mechanism as claimed in claim 1 wherein the clamp release actuator
25 includes a hydraulic cylinder and piston.
3. The braking mechanism as claimed in claim 2 wherein the cam is mounted on the cylinder.

4. The braking mechanism as claimed in claim 1 wherein the cam is a wedge.
5. The braking mechanism as claimed in claim 1 wherein the cam follower of each of the levers is a roller rotatably mounted at the second end of said each of the levers.
- 5 6. The braking mechanism as claimed in claim 1 wherein the variably sloped cam surfaces each includes a replaceable insert.
7. A braking mechanism comprising:
- 10 a frame;
- a lever, the lever having a brake pad at a first end thereof, a cam follower at second end thereof, and being mounted to the frame by a pivot disposed between said first
- 15 and second ends;
- a cam;
- a spring biasing the cam in a first direction;
- 20 a clamp release actuator operable to displace the cam in a second direction, the second direction being opposite to the first direction; and
- a variably sloped cam surface disposed on a side of the cam, the variably sloped cam
- 25 surfaces being in contact with the cam follower, and the variably sloped cam surface having a slope which varies to counteract variations in a spring force of the spring as the cam is displaced thereby maintaining a constant breaking force.

8. The braking mechanism as claimed in claim 7 wherein the clamp release actuator includes a hydraulic cylinder and piston, and the cam is mounted on the piston.
- 5 9. The braking mechanism as claimed in claim 8 wherein and the cam is mounted on the cylinder.
10. The braking mechanism as claimed in claim 7 wherein the cam is a wedge.
- 10 11. The braking mechanism as claimed in claim 7 wherein the cam follower is a roller rotatably mounted at the second end of the lever.
12. The braking mechanism as claimed in claim 7 wherein the variably sloped cam surface includes a replaceable insert.
- 15 13. A rail clamp for clamping a rail, the rail clamp comprising:
- a frame;
- 20 a pair of levers, each of the levers having a brake pad at a first end thereof, a cam follower at second end thereof, and being mounted to the frame by a pivot disposed between said first and second ends;
- a cam disposed between the levers;
- 25 a spring biasing the cam in a first direction;
- a clamp release actuator operable to displace the cam in a second direction, the second direction being opposite to the first direction; and

5 a pair of variably sloped cam surfaces disposed on opposite sides of the cam, each of the variably sloped cam surfaces being in contact with the cam follower of a corresponding one of the levers, and each of the variably sloped cam surfaces having a slope which varies to counteract variations in a spring force of the spring as the cam is displaced, thereby maintaining a constant clamping force.

14. The rail clamp as claimed in claim 13 wherein the clamp release actuator includes a hydraulic cylinder and piston.

10 15. The rail clamp as claimed in claim 14 wherein the cam is mounted on the cylinder.

16. The rail clamp as claimed in claim 13 wherein the cam is a wedge.

15 17. The rail clamp as claimed in claim 13 wherein the cam follower of each of the levers is a roller rotatably mounted at the second end of said each of the levers.

18. The rail clamp as claimed in claim 13 wherein the variably sloped cam surfaces each includes a replaceable insert.

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19. A clamp comprising:

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a pair of levers, each of the levers having a first clamping end, a second end with a cam follower disposed thereat, and a pivot disposed between said first and second ends;

a cam disposed between the levers;

a spring biasing the cam in a first direction;

an clamp release actuator operable to displace the cam in a second direction, the second direction being opposite to the first direction; and

- 5 a pair of variably sloped cam surfaces disposed on opposite sides of the cam, each of the variably sloped cam surfaces being in contact with the cam follower of a corresponding one of the levers, and each of the variably sloped cam surfaces having a slope which varies to counteract variations in a spring force of the spring as the cam is displaced, thereby maintaining a constant clamping force.