
12
1
2
3
4
5
6
7
8
9
10
11

1
00:00:05,690 --> 00:00:03,409
so what we have here is a cylinder of

2
00:00:06,920 --> 00:00:05,700
ice a solid cylinder of ice with a chain

3
00:00:09,020 --> 00:00:06,930
embedded in the middle of it

4
00:00:11,299 --> 00:00:09,030
I made this cylinder of ice with the

5
00:00:13,129 --> 00:00:11,309
chain by just sticking a chain in a bit

6
00:00:15,650 --> 00:00:13,139
of PVC pipe with some water and letting

7
00:00:17,120 --> 00:00:15,660
it freeze overnight I chipped away a bit

8
00:00:19,279 --> 00:00:17,130
of the ice at the end so I could hook

9
00:00:21,080 --> 00:00:19,289
the chain over these two hooks which

10
00:00:24,590 --> 00:00:21,090
were attached to these freestanding

11
00:00:26,150 --> 00:00:24,600
columns on the other side that's what

12
00:00:28,750 --> 00:00:26,160
I'm trying to do is to replicate

13
00:00:31,160 --> 00:00:28,760

something like the buckling of the

14
00:00:33,170 --> 00:00:31,170
trusses in the World Trade Center the

15
00:00:35,330 --> 00:00:33,180
floor trusses were heated from below and

16
00:00:37,069 --> 00:00:35,340
they they sag down as they lost their

17
00:00:39,110 --> 00:00:37,079
structural strength and they called in

18
00:00:41,690 --> 00:00:39,120
the exterior wall of the World Trade

19
00:00:44,270 --> 00:00:41,700
Center which in part led to the eventual

20
00:00:46,459 --> 00:00:44,280
collapse I'm going to speed this up a

21
00:00:48,080 --> 00:00:46,469
little bit here because nothing much

22
00:00:50,479 --> 00:00:48,090
happens for the first few minutes these

23
00:00:52,580 --> 00:00:50,489
cylinder remains pretty stiff it just

24
00:00:57,639 --> 00:00:52,590
drips a bit of water and nothing nothing

25
00:00:59,959 --> 00:00:57,649
moves for the first five minutes or so I

26
00:01:02,029 --> 00:00:59,969
put in a bit of ice here just so you can

27
00:01:05,329 --> 00:01:02,039
see ice melting and then I'm going to

28
00:01:08,480 --> 00:01:05,339
add a clock this is about five minutes

29
00:01:11,719 --> 00:01:08,490
in so it started at 25 to 12 back to

30
00:01:13,880 --> 00:01:11,729
real time here and watch the link on the

31
00:01:17,810 --> 00:01:13,890
right hand side there's going to be a

32
00:01:20,450 --> 00:01:17,820
failure there and there he goes now that

33
00:01:22,390 --> 00:01:20,460
was a little fall it pulled in the

34
00:01:24,530 --> 00:01:22,400
columns a bit but not really that much

35
00:01:26,570 --> 00:01:24,540
and we'll speed it up again there I

36
00:01:29,179 --> 00:01:26,580
think what's interesting here is just

37
00:01:32,390 --> 00:01:29,189
how gradual this defamation is this is

38
00:01:36,050 --> 00:01:32,400

sped up 20 times and you can see the the

39
00:01:39,859 --> 00:01:36,060
ice cylinder is just really slowly kind

40
00:01:41,990 --> 00:01:39,869
of creeping downwards now we're back to

41
00:01:43,730 --> 00:01:42,000
real time so you can actually see the

42
00:01:46,340 --> 00:01:43,740
movement of the column on the right

43
00:01:48,620 --> 00:01:46,350
leaning being pulled in in real time and

44
00:01:49,999 --> 00:01:48,630
the defamation of the ice cylinder it's

45
00:01:51,469 --> 00:01:50,009
interesting the cylinder is actually

46
00:01:54,260 --> 00:01:51,479
still pretty stiff and you'll see in a

47
00:01:57,289 --> 00:01:54,270
second when the right-hand column Falls

48
00:01:59,330 --> 00:01:57,299
who actually pushed the left-hand corner

49
00:02:02,109 --> 00:01:59,340
because of the stiffness of the the ice

50
00:02:06,620 --> 00:02:02,119
connection he doesn't really break until

51
00:02:12,300 --> 00:02:10,440
here's a close-up look at that final

52
00:02:14,850 --> 00:02:12,310
moment you can see the column on the

53
00:02:16,440 --> 00:02:14,860
right-hand side leaning in I don't

54
00:02:18,420 --> 00:02:16,450
really see any cracks in the ice it

55
00:02:21,890 --> 00:02:18,430
almost seems like it's just bending it's

56
00:02:24,750 --> 00:02:21,900
obviously gradually losing its stiffness

57
00:02:28,380 --> 00:02:24,760
which is why it's moving in so slowly

58
00:02:31,260 --> 00:02:28,390
it's not not fracturing it is actually

59
00:02:33,720 --> 00:02:31,270
bending just getting us gradually less

60
00:02:36,810 --> 00:02:33,730
and less stiff so I think that if I had

61
00:02:38,100 --> 00:02:36,820
fixed the column on the left so it

62
00:02:40,530 --> 00:02:38,110
couldn't move then it would actually

63
00:02:42,720 --> 00:02:40,540

have resisted at this point the movement

64
00:02:47,100 --> 00:02:42,730
of the column on the right

65
00:02:50,100 --> 00:02:47,110
causing the gradual curvature to just