Episode Book

EPISODE #5575

Why 1930s Riveters Carried Bigger Pouches Than You Do

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SYNOPSIS

What did Empire State Building ironworkers actually carry on their belts? A listener's research agenda sends us up the scaffolding: the four-man riveting gang, the funnel-shaped bucket that catches thousand-degree steel by feel alone, and why those pouches were sized for bulk resupply at altitude rather than reconfiguration. Then we trace the documented military lineage that leads to MOLLE — M1910 grommets, M1956 slide fasteners, M1967 nylon, ALICE clips, and the load-bearing vest — to explain why the small modular pouch isn't progress, just a different optimization.

TRANSCRIPT



Corn

I have to admit, when I saw the words "Empire State Building" again, my first thought was, we just did this. My second thought was, we didn't actually do this part of it.



Herman

We did the men. We didn't do what they were carrying.



Corn

Right. So here's what Daniel sent us. He says we've talked about modular carry systems plenty of times on this show, tool pouches, MOLLE, and he thinks they're great. But he keeps coming back to one question, which is, why are these pouches so small? He points out that once you get into body carry, you realize how efficient it is to move weight that way, provided it's supported properly. And then he gives an example, one of those loose-items dump pouches you see on the market that fits a water bottle or a handful of screws. Meanwhile he's been watching footage of the hot riveting process on the skyscrapers, and he noticed those workers were carrying pouches big enough to hold massive bolts and the wrenches to fix the rivets. Which makes sense, because when you're up on scaffolding on a skyscraper, replenishing is not something you want to be doing frequently. He says he can't think of a better test case for durability and ruggedness than that environment. And then he asks the real question. What did those carry belts and pouches actually look like, what was the typical pack-out, why were they so much bigger than modern modular pouches, what successors came before MOLLE, and what made that high-altitude environment such an extreme test.



Herman

That's five questions.



Corn

Daniel doesn't send one question. He sends a research agenda.



Herman

So let's start with the men themselves, because the gear only makes sense once you know the workflow. The four-man riveting gang.



Corn

Four men, one rivet at a time.



Herman

The organizing unit of the whole skyline. You've got a heater, sometimes called a furnace worker, firing rivets in a portable forge until they're red hot. You've got a catcher, sometimes called a sticker-in, whose job is to receive the rivet. You've got a bucker-up, also called a holder-up, who braces the rivet from the far side with a dolly bar. And you've got the riveter, running a pneumatic hammer to mushroom the stem into a second head.



Corn

And the catcher is the one we care about, because the catcher is the one holding the bucket.



Herman

The catcher is the whole reason this episode exists. In the Lewis Hine photograph, "Three workers securing a rivet," the catcher is watching with a funnel-shaped bucket in one hand and tongs in the other. That's the image. That's the carry system.



Corn

Describe the bucket for me. Because when I hear "bucket," I picture a janitor's mop bucket, and I don't think that's right.



Herman

It's not. It's conical, funnel-shaped, metal. Held in one hand. And the reason for the shape is the entire design story of the episode. That bucket is an interface for catching a red-hot rivet thrown at you from a floor or two below, and you are not allowed to look at it while



Herman (continued)

you catch it.



Corn

Wait. Say that again.



Herman

You can't watch the rivet come in. You're standing on a beam, you've got the bucket out, and a piece of steel heated to around a thousand degrees is arcing up through an opening in the temporary floor deck toward you. You catch it by feel and by geometry. The funnel does the aiming for you.



Corn

So the bucket is not a container. It's a catcher's mitt.



Herman

It's a catcher's mitt that also has to hold four or five of them without any of them touching each other in a way that welds them together.



Corn

That's the part nobody thinks about. Hot metal in a pile is not a pile. It's a welding project waiting for a reason.



Herman

The furnace tender turns the rivets with long-handled tongs and judges the temperature by the shade of red. They were looking for the color of yellow, which is around a thousand degrees. And the rivets arrived at the site with one head already formed, so all the worker on the beam has to do is drive the other end.



Corn

So the rivet is a half-finished thing being thrown through the air at a man who can't look at it.



Herman

And there's a pitcher in the chain too. The furnace tender hands the properly heated rivet to the pitcher, and the pitcher throws it up through the opening in the temporary deck to the catcher. So the full sequence is furnace, pitcher, catcher, holder-up, riveter. Five people for one fastener, and the fastener has to be set before it cools.



Corn

How fast are we talking?



Herman

An experienced crew could install one rivet per minute in the larger sizes, two per minute in the smaller ones. That's the pace constraint that drives everything. The rivet is losing heat from the moment it leaves the forge. If you stop to dig a rivet out of a pouch, you've lost the rivet.



Corn

So the catcher can't have a closure. Can't have a flap. Can't have a zipper. Can't have anything that requires a second hand or a second thought.



Herman

The bucket has to be open, standing, and stable in one hand. Which is why I'd push back gently on the framing that these were crude. The funnel shape is a functional design constraint. No modern modular pouch replicates it, because no modern modular pouch is asked to catch something blind.



Corn

What about the rest of the pack-out? The catcher's bucket is the star, but he's not carrying only the bucket.



Herman

No. The tools of the trade are spud wrenches, which are erection wrenches, bull pins, connecting bars, and the pneumatic rivet hammer. And here's the thing that surprised me when I went looking. Modern ironworker belts still carry exactly that list. Klein Tools makes an Ironworker Complete Toolbelt System, and it's a bolt bag, a spud wrench holder, a connecting bar holder, a bull pin holder, and a three-pocket tool holder. Same inventory, ninety-some years later.



Corn

That's not evolution. That's a fossil record.



Herman

It's a fossil record with a leather belt. Nine pockets, two-inch belt, five and a half pounds empty, fits a twenty-eight to thirty-six inch waist. That's the modern descendant.



Corn

And the bolt bag. Daniel specifically mentioned bolts. What's in a bolt bag?



Herman

Bolts, and the wrenches to tighten them. And this is where the size question starts to answer itself. A bolt bag is sized for bolts, plural, heavy, and the wrench you need to drive them. On a scaffold a quarter-mile up, you are not making a supply run because you ran out of three-eighths hardware. You carry enough to finish the connection and then some.



Corn

Because the cost of a resupply isn't measured in time. It's measured in the climb.



Herman

And that's the honest answer to Daniel's question about why the pouches were bigger. It's not that 1930s workers were stronger or that leather was cheaper. It's that the resupply loop was catastrophically expensive. Every trip down and back up is a climb of hundreds of feet on a structure that is, at that moment, partially built and not particularly interested in your continued existence.



Corn

So the pouch is sized by the resupply interval, not by the tool.



Herman

The pouch is sized by the worst-case interval between replenishments. That's the design driver. And once you say it out loud, the modern small pouch makes sense too, because the modern pouch is sized by a completely different driver.



Corn

Which is reconfiguration.



Herman

MOLLE and PALS are built around a one-inch nylon webbing grid. The whole point is that you attach many small pouches in whatever arrangement the mission needs, and you change that arrangement when the mission changes. The pouch is small because the system is supposed to be flexible. If you weld everything into one giant pouch, you've thrown away the flexibility.



Corn

So the big pouch and the small pouch aren't competitors. They're answers to different questions.



Herman

That's the trade-off. Modularity versus capacity. And I want to be fair to both sides here, because it's tempting to frame it as progress. It's not progress. It's a different optimization. The 1930s ironworker optimized for bulk replenishment at altitude. MOLLE optimizes for reconfiguration in the field. Both are correct for their problem.



Corn

Here's the thing I keep coming back to, though. Daniel asked what the carry belts and pouches actually looked like, and I went looking for a spec, and there isn't one.



Herman

There isn't one. I looked too. There's no dedicated historical source describing a purpose-built carry belt worn by Empire State Building steelworkers specifically. No issued harness, no standardized rig, no quartermaster drawing.



Corn

So what were they wearing?



Herman

Individual leather tool belts, and the catcher's rivet bucket. That's the evidence. The closest documented artifacts are the conical bucket in the Hine photograph and the modern ironworker leather belt, which is the same tool set in the same arrangement, still being sold.



Corn

Which means the answer to "what did the carry belt look like" is, it looked like whatever the man bought.



Herman

It looked like a personal purchase. Which is a very different story than the military lineage, where everything is issued, standardized, and drawn from a supply catalog. The ironworker bought his own belt. He wore it until it died. There's no spec because there was no procurement office.



Corn

That's a real finding, and I want to sit with it for a second, because it changes the shape of the episode. We're not tracing a designed system. We're tracing a folk system that happened to converge on the same tool list for ninety years.



Herman

Converged is the right word. The Klein belt isn't a descendant of the Empire State gear in any documented lineage sense. It's a parallel survival. The same problem produced the same solution twice.



Corn

Okay. So we've got the mechanism. The toss, the bucket, the pace, the pack-out. Now pull back. Daniel asked about successors that predate MOLLE. What's the lineage?



Herman

The military lineage, which is the one that's actually documented, runs M1910, M1956, M1967, ALICE, IIFS, then PALS and MOLLE. And each step is a fix for the previous step's failure.



Corn

Start with M1910.



Herman

Cotton webbing pistol belt with rows of grommets along its length. Used through both World Wars. The grommets are the attachment system. You hang pouches off them.



Corn

And the failure of grommets?



Herman

Grommets are fixed points. You can only hang a pouch where there's a hole, and the holes are spaced for the pouches somebody already thought of. If you need a new pouch in a new place, you're out of luck.



Corn

So M1956 fixes that.



Herman

M1956 is the "Belt, Individual Equipment." It keeps the cotton canvas pistol belt but introduces a metal slide fastener. Now you can slide a pouch to any position along the belt instead of being locked to a grommet.



Corn

Continuous adjustment instead of discrete points.



Herman

And then M1967 is the materials fix. Nylon construction instead of cotton, for durability and to reduce water retention. Cotton holds water. Nylon doesn't. If you're carrying ammunition and you're wet, that matters.



Corn

And ALICE.



Herman

ALICE, All-purpose Lightweight Individual Carrying Equipment, adopted as US Army Standard A on the seventeenth of January, nineteen seventy-three. Developed between nineteen sixty-seven and nineteen seventy-two under the LINCLOE program. Components attach via slide keepers, which everyone calls alice clips.



Corn

And then IIFS.



Herman

Individual Integrated Fighting System, nineteen eighty-eight. First standard-issue load-bearing vest, and the significant move is that it shifts weight to the upper torso. That's a real change in philosophy. You're no longer hanging everything off a belt at the waist. You're distributing it across the shoulders and chest.



Corn

Which is the same insight as the tool belt and suspenders argument.



Herman

It's the same insight. The belt holds the weight, the suspenders carry it. IIFS had quality-control problems, so it's not a clean success story, but the weight-distribution idea stuck.



Corn

And then PALS.



Herman

Mid-nineteen-nineties. A Natick Soldier Systems employee named John Kirk develops the Pouch Attachment Ladder System, PALS. One-inch nylon webbing grid. It replaces the slide fastener entirely. And MOLLE is built around it, centered on the Fighting Load Carrier vest.



Corn

So the whole arc is attachment systems getting more flexible. Grommet, slide fastener, slide keeper, webbing grid.



Herman

And the pouch gets smaller with each step, because the flexibility is the product. The system doesn't need one big pouch when it can hold fifteen small ones in any arrangement.



Corn

There's a British parallel too, isn't there?



Herman

Pattern 1908 Web Equipment, the Mills gear. And line-man tool pouches added to stores on the twentieth of January, nineteen twenty-seven, derived from Pattern 1914 ammunition pouches. So the Commonwealth was running the same play, adapting ammunition pouches into tool pouches for the men who climbed poles.



Corn

Which is the closest thing to the ironworker problem in the military lineage. A lineman is also working at height with tools he can't easily resupply.



Herman

A lineman is the exact analogue. Working at height, carrying tools, no easy resupply. And the British solution was to take an ammunition pouch and repurpose it, which tells you the pouch was always a generic container and the contents were the variable.



Corn

Okay, so that's the lineage. Now the environment. Daniel called it the best test case for durability and ruggedness he could think of. Is he right?



Herman

He's right. Workers stood on narrow scaffolding hundreds of feet up. It was always windy. In winter, men cleaned ice and snow off the steel beams before they could work on them. No safety lines. No helmets. And the math on a fall is brutal. From a quarter-mile up, it would take eleven seconds to hit the ground. That's the framing The Guardian used, and it's the right framing, because eleven seconds is long enough to think about it.



Corn

And this isn't ancient history in terms of the risk. Ironworkers still die at thirty-five to fifty fatalities a year, most from falls.



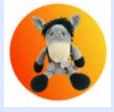
Herman

The trade is still the trade.



Corn

Tell me about the Mohawk crews, because that's the human story underneath the gear.



Herman

The Mohawk ironworker tradition starts in eighteen eighty-six with the Victoria Bridge over the St. Lawrence. Mohawk riveting gangs helped build the Chrysler Building, the Empire State Building, Rockefeller Plaza. By nineteen sixty, around eight hundred Mohawk ironworkers and their relatives were living in Brooklyn, in what was called Little



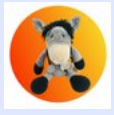
Herman (continued)

Caughnawaga, around Local 361.



Corn

And the Wigwam Bar.



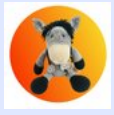
Herman

The Wigwam Bar's sign read, "The greatest ironworkers in the world pass through these doors."



Corn

That's not a slogan. That's a verdict.



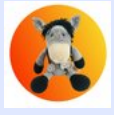
Herman

And then there's the part that reshaped how the gangs were organized. The nineteen oh seven Quebec Bridge disaster killed thirty-three Mohawk men from Kahnawake. More than two-thirds of them were married, which left twenty-four widows.



Corn

In one accident.



Herman

And afterward, the Mohawk women demanded that men not work in family groups anymore. So they dispersed across riveting gangs. Which is a labor-safety reform that came from the kitchen table, not from a regulator.



Corn

That's the detail that stays with me. The crew composition changed because the women said no more.



Herman

And it's a real safety insight. If your whole extended family is on the same crew, one bad day takes the whole family.



Corn

What about the Depression context? Because that shapes the durability story too.



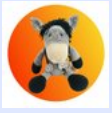
Herman

Men would wait in the street for someone to fall off so they could take their job. That's a direct quote from the history. And it tells you the gear had to be self-contained, because there was no margin. You didn't get a second belt. You didn't get a replacement bucket. You had what you had.



Corn

So the durability test wasn't just for the gear. The gear had to be rugged because the worker couldn't afford to replace it and the job couldn't afford to stop.



Herman

Both. And that's where Daniel's framing is exactly right. This is the extreme test case, because the failure mode of the gear is a man at altitude with a hot rivet and no way to catch it.



Corn

Alright. Let me try to state the trade-off cleanly, and you tell me if I've got it.



Herman

Go ahead.



Corn

The 1930s ironworker pouch is large because the resupply interval is long and dangerous. The modern modular pouch is small because the reconfiguration requirement is constant. One is optimized for how rarely you can restock. The other is optimized for how often you need to change.



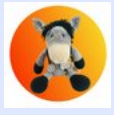
Herman

That's it. And neither one is wrong. They're answering different questions, and the questions come from the environment.



Corn

Which raises the thing I actually want to ask. If the bucket was optimized for a blind catch and the modern pouch is optimized for reconfiguration, what does that say about how we decide what good carry design even means?



Herman

It says good is relative to the constraint. There's no universal good pouch. There's only the pouch that fits the resupply loop and the task.



Corn

Which is a much more interesting answer than "old gear was crude and new gear is better."



Herman

It's also why the research gap bothers me. The military lineage is documented down to the adoption date and the program name. The industrial lineage is a photograph and a modern catalog page.



Corn

Because nobody was writing it down. The ironworker wasn't filing a spec sheet. He was buying a belt.



Hilbert

The number's off. It's closer to one rivet every two minutes on the big stuff, not one a minute, if you're counting the whole cycle including the furnace.



Corn

Huh.



Hilbert

I did a season as a stagehand rigger in a regional theater. Old union guys had a saying about their tool belts. You don't carry what you might need, you carry what you can't climb back down for.



Herman

That's the resupply interval in one sentence.



Hilbert

It's the whole thing. And I'd correct you on one point. The modern ironworker belt isn't a descendant of the skyscraper gear. It's a parallel survival. The riggers I knew had their own lineage, and it went back to sailing ship rigging, not to the Empire State Building.



Corn

There are at least three lineages. Military, industrial ironworker, and stage rigging.



Hilbert

At least. And the real successor to the catcher's bucket isn't a pouch at all. It's the tool lanyard. Because the lesson of working at height is that anything you can drop, you will drop.



Herman

The bucket has no lid.



Hilbert

Right. And that's not a limitation. I've still got the leather bolt bag from that job. Heavy thing, broken snap I never fixed. A bag that opens when you don't want it to is worse than a bag that won't close. Same reason the bucket had no lid.



Corn

The open top is a feature.



Hilbert

The open top is a feature. The modern instinct is to add a closure and make it modular. Sometimes you're solving a problem the old workers didn't have.



Corn

Where does that leave us? If the bucket was optimized for a blind catch and the modern pouch is optimized for reconfiguration, then good carry design isn't a ladder you climb. It's a fit to a constraint. And the industrial ironworker belt is a whole parallel tradition that never made it into the standard narrative, which means there may be more of these undocumented lineages out there, sitting in photographs and old catalog pages, waiting for somebody to notice.



Herman

If you want to see the sources and the Hine photograph we talked about, check the show notes at my weird prompts dot com.



Corn

This has been My Weird Prompts. Thanks to our producer, Hilbert Flumingtop.



Herman

If you're enjoying the show, a review helps other people find it. We'll be back soon.