

This shows how to "tap" spider-web coils. The wire you start with and each turn of wire for the first nine turns are tapped and the tap wires brought to the contact points of the "units" switch. The rest of the coil is tapped every ten turns and each tap wire is brought to a contact point on the "tens" switch. Above, at the right, is a "ghost" view of one of these switch arrangements showing how the switch blade mounted and how the contact points are put through holes in the panel. Below it is a view showing how bluding posts are used

### Spiderweb Coil Taps and Switches

blades.

contact points will go along this semi-circle and consequently the end of the blade will slide over each one.

Along this semi-circle, lay off points three-eighths of an inch apart—ten for the units switch and eleven for the tens

It is at these points that you must

drill the holes to receive the shafts of the little contact points. The distance,

three-eighths of an inch, is just about right for the standard-sized switch

pin hole before you began winding—goes to point No. 9. The tap on the first turn of the coil goes to point No. 8, the second to point No. 7 and so on. This

by short wire to the zero point on the tens switch, and this latter point has no other connection. The wiring of the tens points is plain sailing.

If you will follow the setting of the

two switches shown in the diagram you

of the coll we desire in our circuit.

You see, we're still dwelling on those other or the wire on one point touching erweb colls. Have you wound yours the wire or point next to it.

And tapped them, according to instructions given in the last two panel, measure the exact length of the

lessons?

Now, before we build a neat little shaft to the part of the blade that is shaft to the points. With a compass or a pair of dividers or by any other method of handling taps from any coil.

You'll want to get your material right sow. So, for the complete spiderweb vario-coupler which we are building, bere is what you'll need:
Forty-two nickel switch contact

Four nickel switch blades and knobs,

Four nickel binding posts. Brass will do, but nickel plate makes a thousand per cent better looking job. specially if you build your stand of black, polished material such as formica or bakelite or ebony asbestos wood. The sickel-plated points and posts stand out or bakelite or ebony asbestos wood. The nickel-plated points and posts stand out against the black like a string of diamonds on a movie actress, and nothing could be brighter than that. You'll be proud of it—the panel, not the actress.

In the last talk we learned how to like a string of the panel of th the last talk we learned how to the spiderweb coll, taking taps first off turns numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and then of numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100. The first bunch of taps we call the "units" taps and we have a switch and a set of switch contact points for them. The others we call the "tens" taps and they, too, have their switch and contact

A typical switch contact point is shown in the illustration. It has a threaded shaft that shoves through a hole in the panel. The end of the tap wire is bent around the rear end of this shaft and the little nut is screwed on tight, holding the tap wire firmly against the shaft and the whole switch point solidly in the panel. Naturally, you must scrape the insulation off the end of the tap wire so as to have a metal-to-metal connection.

These switch points must be inserted in the panel in a semi-circle with the the blade will pass from one point to another smoothly. Consequently, the points must be so close together that the end of the blade does not have room to get in between them, yet far enough spart to prevent one point touching an-

### Today's Programs

Philadelphia Station (WSI) (Strawbridge & Clothler)

1:16 P. M.-Late news Items from Public 5:30 to 6 P. M.—Baseball scores. 5.30 [c. 8] P. M.—Haseball scores.
7.30 P. M.—A brief lecture on the Einstein discoveries, the "Theory of Relativity." by Prof. It. C. Hailey, of New York.

A brillant evening concert, beginning at 1.35. Program: "Ronde Capprincio." for two pianes, Menedelsseein, Edith Raymond Mesten and James C. Warhurst; duet. "Hear M. Norma." Bellini, Derothy C. and Helen C. Warhurst; soprano colo. "Lesse o Mine, Walt, Derothy C. Warhurst, flute obbligate, played by Warner R. Heston, alto solo. "Voga, Voga Gondo-it." Clarke, Helen C. Warhurst, violin solo. "Markettellation." from "Thais," Massenet, Edwin Coggeshall, Mrs. Harry A. Stiles, accompanist; duet. "In a Garden of Roses, "Enderson, Dorothy C. and Helen C. Warnert; soprano solo. "The Wind's in the South," Scott, Dorothy C. Warhurst; also solo, "Love, the Pediar," German, Helen C. Warhurst; also company C. and Helen C. Warhurst, James C. Warhurst at the plano.

### Philadelphia Station (WIP) (Gimbel Brothers)

150 P. M.—Selections by the Gimbel Orchestra. Plano. Raymond Steen: violin, 4800 Unit. ello. George D'Annunzio; Saxaphone. Vincent duisine.
230 P. M.—Recital by Mrs. Irvin Duer.
sprano. 'As I Went Salling Ry, 'Huster;
'All the World Awakes Today,' German;
'in Italy,' Boyd, 'The Plues of Pan.'
Monckion. Mrs. Frances Babcock, accomballst. Bonckion. Mrs. Frances
panist.

\$ P. M.—Recital by E. M. Cady, violinist.
assisted by Mrs. Frances Babcock, planiste.
795 P. M.—Final baseball scores.
713 P. M.—Uncle Wip's bedtime stories
for the biddies. kiddies.
P. M.—Uncle Wip will read the of children writing to him.

### Newark, N. J., Station (WJZ) (Westinghouse)

6 P. M.— Review of the Iron and Steel Industry and Their Relations to General Business Conditions. by the Iron Age.
7 P. M.— "Animal Stories," by Fiorence Smith Vincent, courtesy New York Evening Telegram. Jessiness Conditions." by the Iron Age.

7 P. M.—"Aningal Stories," by Fiorence smith Vincent, courtesy New York Evening relegram.

730 P. M.—"Palestine." by Gershon Agronsky. New York representative of the M. A. A. Retz, Jerusalem.

8 P. M.—Recital by Jr. and Mrs. Richard Honeill, courtesy C. M. Drake.

930 P. M.—Concert by the Cosmopolitan Satophone Choir. Rodger E. Hailer, so-ganois Frank Jamitti, tenor; N. D. Campelli, tenor; Thomas Snyder melody; Albert Debbelsar, aito; Ed F. DeMott, alto; D. J. Barteluce, alto; Charles E. Abate, leader, alto; the debbelsar, aito; Ed F. DeMott, alto; D. J. Barteluce, alto; Charles E. Abate, leader, alto; Menkel Coningswood, baritone; Charles L. Haller, bass; Joseph Lauf, drums and traps. Program: "Stoney Point," march, P. Laurendeau; "Invercargili," march, Aleg F. Lithsow; "Asleep in the Deep, Petric, The Sheik," T. Snyder; "Solitude." K. K. King; "Khaki Elli," H. L. Watson; A. Night in June," K. I. King; "Leave Me With a Smite," Kochler and Hurnett, "That's How I Believe in You," Bert Ruie, "Comedy Tom," Gus King; finale. Samue; Danks.

### Pittaburgh Station (RDKA)

(Westinshouse)

20 P. M. and at fifteen-minute intertithereafter, baseball scores.

-Baseball scores. News.

40—Government market reports, and a set of the New York Stock Exchange.

-Baseball scores. "Pittsbursh—Its stable Tendoncies." by E. A. Woods Insurance Medical Schools and the School Festival and a Association," by Will Earhart, surface of music, Pittsburgh public schools.

40—Mr. Rabbit Grossly Deceives Mr. L. a bedtime story for the children.

- Music program by artists from the Gord Blanche Sanders Walker, Eleanor Conley, soprano, Jeanne Mahey, some Market Schools Mrs. Frank M. Myler, contraitor, a Machardy, pianist; Mrs. Ernest S. R. apprano; Mrs. Frank M. Myler, contraitor, and Machardy, pianist; Mrs. Ernest S. R. Nattzser, tenor; Blanche Sanders Walker, accompanist; Dr. John Hier-Belections: "Lo Hear the Gentle Lark" (Westinghouse)

Bob Hammill Now Engineer on & R.'s Fastest Train in World

Thirty-three years ago today Bob the world, the Philadelphia and Rending Railway's "Boardwalk Flyer," first got his hands on a throttle. For twelve years prior to May 10, 1889, he was employed by the railway as water-boy, member of a section gang, in the shops, and firing. He lives at 223 Hudson street, Gloncester City.

He was born in County Armagh, Ireland, October 14, 1858, and came to this country when he was eighteen months old. In 1877 he got n job as months old. In 1877 he got a job as waterboy to a construction gang laying the rails over which he now runs.

The "Boardwalk Flyer," which the International Encyclopedia calls the fastest regularly scheduled passenger train in the world, is the 4 P. M. Atlantic City express. It was recently named by commuters, and covers the fifty-six and one-half miles between Philadelphia and Atlantic City in fifty-five minutes.

Miss Mabel Stark.

A slender figure, she stands twice daily, surrounded by five tigers and all naminals. Scratching one of their heads with the end of a stick, she laughs as they growl and calls. "Kitty, kitty."

The cage was surrounded today by an interested collection of "loafers" and the men of the Ringling Brothers and Barnum & Bailey Circus, and the universal comment was, "How does

### 165 ARE INITIATED

Ceremonies for Venerable Hermits Held in Moose Hall

Initiation ccremonies for 165 new venerable hermits were performed at the opening night session of the Knights and Ladies of the Golden Eagle gath. ering in Moose Hall, Broad and Master with streets, last night. Prior to that, wives and daughters of members held a meeting at the Lorraine. The women later attended a vaudeville entertainment. The initiation ceremonies were given by Mount Calvary Hermitage, of this city, inder the direction of Past Grand Chief Walter C. Baus.

Presentations were made by Past Grand Chief Baus and E. A. Crotzer, grand chief-elect of Pennsylvania. A ball will be held tonight in Turnge-meinde Hall, Broad street and Columbia avenue. A sight-seeing tour of the city has been arranged for Friday.

### STUDENTS DEBATE TREATY

Versailles Pact Subject of Contest at St Joseph's College Tonight

The annual prize debate of the Villiger Debating Society, composed of stuplace tonight in the college, will take Seventeenth and Stiles streets. "Resolved. That the Reparation Clause of the Versatlles Peace Treaty Should Be skir Strictly Enforced." is the subject of the debate.

On the negative side of the question are F. N. Quinn, '24; William A. Berry, '23, and Robert C. Kitchen, '23. On the affirmative are Richard F. Grady, '24; James F. McBride, '23, and Francis J. Meyers, '23, Thomas W. Cales, '10, Meyers, '23, Thomas means that the tenth turn goes to point W. Oakes. 22, is chairman of the dezero on the unit switch and connects bate. Charles Leo O'Brien, S. J., is moderator of the society.

### **TROLLEY HITS MAN, 88**

Dr. Harry Crawford, Retired Dentist, Seriously Hurt

will see that this arrangement makes it possible to include any number of turns Dr. Harry Crawford, eighty-eight years old, a retired dentist, of Frank-Imagine an electric current coming in from the aerial. It goes by wire to the shaft of the units switch blade, flows the shaft of the blade to the No. 3 point, his home with his son, the Rev. Harry H. Crawford, pastor of the Hermon Presbyterian Church, Frankford aveing a way out, but doesn't find an exit t gets to the wire going to point

until it gets to the wire going to point
No. 60 on the tens switch, from which
it goes along the blade and by wire to
the ground. We have thus included
sixty-three turns of the coil in our circuit.

In this way we govern the wavelength which we are to receive. The
more turns we use the longer the wavelength to which the set will respond.
On my own aerial I find that I get
the amateur, 200-meter stations, with
the primary coil including about thirtyfive turns and the secondary about sixty

Training School Elects

Training School Elects

five turns and the secondary about sixty or thereabouts. The 360-meter broad-Class of '02, Northeast Manual Training High School, held its twencasting stations come in with about fifty or sixty turns in the primary and ninety to 100 in the secondary. This is without using any variable condensers. tieth annual reunion at the Poor Rich. ard Club last night. Officers were elected as follows: Edward A, Steele, president; Jacob Rech, Jr., vice pres-Report Croatla is Republic

Rome, May 10.—The Croats have proclaimed an independent republic of butions to the Andrew J. Morrison Me-

## Crostin and named the members of a morial Fund for the purpose of estab-Ministry, says a dispatch to the Tempo on the Adriatic. Mr. Morrison, who on the Adriatic. Mr. Morrison, who died about two years ago, was for many M. Reditch was named as President, years principal of the school. See the local ALPH/dealer -he will be glad to give you "ALPHA CEMENT-How

to Use It"—a practical cement construction handbook, 104 pages, illustrated, telling how to build retaining and enclosure walls, posts, foundabuild retaining and enclosure walls, posts, foundations, driveways, curbs, culverts, steps, porch floors, cellars, tanks, bins, troughs, and scores of other permanent, fire-safe, paint-saving improvements around home and farm.

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use Alpha Cement

The second designation of the second second

### AT THROTTLE 33 YEARS SOFT SH-H-H FROM GIRL ENDS GROWLS OF ANGRY BEASTS

Hammill, engineer of the fastest train Slender Figure of Animal Trainer Who Cows Animals Holds Thrills for Big Circus Crowds

> "Sh-h-h; don't make so much noise!" tweed knickerbockers and pink-striped blouse. Of medium height, she has a wealth of curly blonde hair and blue eyes, which snap as she jumps about, cracking her whip and issuing combut to a snarling, graceful tiger-cat, which spat and growled, clawing the air in an effort to reach his trainer, Miss Mabel Stark.

The cage was surrounded today by an interested collection of "loafers" and the men of the Ringling Brothers and Barnum & Bailey Circus, and the universal comment was, "How does she do it?"

Laughing as they growled apparently enjoying herself thoroughly. Miss Stark cracked the whip which sent the animals crouching with terror. Fear was foreign to her.

Trained Beasts Twelve Years Twelve years ago Miss Starke began

her career as an animal trainer.
"I have always been fond of animals,"
she explained. "My first attempt was
with two tigers, and then I began gradually to increase the number unti at one time I had as many as twelve.
"I have made a study of the tiger;
got it off into a corner where I can observe its movements. To be totally unafraid of them and have them realize this is one of the fundamentals. once an animal thinks that its trainer

is afraid, the power is gone.
"People frequently speak of 'tame'
wild animals. There is no such thing. o wild animal is tamed, and will grasp the first opportunity to spring for the "I never burt them, because an ani-

mal will not be cowed into submissive-ness by force. Not one of my animals are marked, and yet I have been torn by them several times.

### Has Scar From Animal

As she spoke, Miss Starke pulled back long, angry-looking scars, a seamed slash of red against the white of her

And the sharp claws catch my ," he added.

"But I've never gotten what we choose to call 'cold feet,' and I am always anxious to get back to them. The black panther is a treacherous old fellow, but he is my favorite; he's so spry and has so much life to him.

"I have to watch him carefully.

however, because, as you see, he is ready to spring. But the crack of my whip terrifies him, as it does the others. and they all back away from me. They never chase me. I regard them as school children, interesting to teach and put through their tricks. You know, if a dog started after you and you backed away, he'd keep on coming. "And so it is with my tigers. When I stand still, they do, too. My revolver is loaded with blank cartridges, in case the whip does not sufficiently righten them. The sound of the report fills them with such terror as to leave them robbed temporarily of their ferocity."
Miss Stark was attractive in her gray

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mands.

The circus is giving two performances upper story windows and heard the daily at Ninetcenth street and Hunting clanging gongs of the fire engines. The firemen extinguished the blaze quickly.

Fire, starting in the cloakroom of St.

Josaphat's Polish Catholic Church
School, Manayunk, yesterday afternoon
threatened the lives of the 800 children

threatened the lives of the 800 children threatened the lives of the 800 children attending their classes. Under the direc-tion of Mother Stantslas, the boys and girls marched quiet'y out of the build-ing just as they do every day for fire

drill.

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