Telephone Collectors International

Singing Wires

Newsletter

Volume 17, Number 11 **NOVEMBER 15, 2003**

This Month:

Let's Just Do It!
A Message from the President
Roger Conklin Tells of His 64 Years in Telephony.
The San Jose Show.
George Howard's Telephone History.
A Restored 1948 Chevy.
Mitch's Attachment Corner
A North of the Border Phone Collection in Color

The owner of this restored 1948 Chevrolet telephone truck has been invited to display it at the Elgin IL. TCI Memorial Day Show on May 29 and 30 of next year. See story starting on page 3.

Let's Just Do It!

The following 2 paragraphs are taken in part from a declaration in TCI's inaugural newsletter dated June, 1986. The structure of the Board of Directors has changed but the ideals to which this then new organization was dedicated have not changed. As a new organization, TCI had many ideas, objectives and goals ... ***and we succeeded***. We succeeded for almost 17 years ... maybe we missed a couple of turns along the way but we always got back on track. By working together now we can succeed for another 17 years. Let's just do it!

TCI is Alright! *Paul & Bev McFadden ... Editors*

TCI is a not for profit historical society comprised of individuals who share an interest in investigating and preserving the historical aspects of telephony. The TCI organizational structure includes twenty-one directors who elect a President, Vice president of Operations, and Secretary/Treasurer. Each year seven directors will be elected for three year terms. A director will be limited to two consecutive three year terms. The benefits of such a structure are many. The most important being the many channels of communication between the management and the membership. With twenty-one directors, the decisions made should reflect the desires of the majority of the members.

As a new organization, we have many ideas, objectives and goals. The first objective is the monthly newsletter which, next to our membership, will be the cornerstone of the organization. Personal classified ads will be an important part of the letter, but current plans mandate the letter to be more than just a clearing house for old telephones. It will also be a vehicle to educate, to inform and to promote.

The above declaration was signed by Barry Erlandson, TCI's first president.

Dear Fellow TCI Members,

I am pleased to announce that Paul McFadden has agreed to return as Editor of Singing Wires. During prior years Paul made this publication the pride and joy of our organization. We deeply regret any situations that may have contributed to the decision Paul made to leave and we pledge to him our full support as we welcome him and his lovely wife Bev back at the helm. Please join me in supporting them by flooding Paul with ads and articles for publication.

I'd also like to take this opportunity to **THANK** our fellow member Jack Clock for his service to TCI during the past year and Roger Conklin, Gary Goff and John Novack for helping facilitate Paul's return.

Our membership needs to know well in advance about show schedules so they can take them into consideration in making their vacation and travel plans. Therefore, TCI would like to announce to both show regulars and rookies, that the TCI Memorial Day Show (5/29/04 & 5/30/04) will be held in Elgin, IL at the Best Western - Plaza Hotel and Convention Center located at the intersection of Interstate 90 and IL Route 31.

Finally, Speaking for the Board of Directors and myself I'd like to let you know that **We Welcome Your Input and that We ask for Your Help as we Join Together to Restore Our Unity, Strengthen TCI and Build for the Future.**

Russ Fierce
TCI President

This newsletter is published by Paul & Bev McFadden for Telephone Collectors International. The opinions expressed in this newsletter are those of the members of TCI and do not necessarily reflect those of the publishers or Telephone Collectors International.

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Article and Ad deadline 25th of previous month. Please send corrections or suggestions to SWEDITOR@AOL.Com

President Belaunde's "Recall"

On October 3, 1968, our phone rang at the ungodly hour of 2:30 a.m. in our bedroom in Lima,Peru. It was the night chief operator in charge of the domestic and international switchboards calling to tell me that the room was filling up with machine-gun bearing soldiers. "It must be a military coup; what should I do?" I told her to listen to the instructions of the officer in charge and follow them.

Roger Conklin relates one of the interesting incidents that happened during ***"Roger's Sixty-four Year Career in Telephony"*** *... the rest of his story starts on page 4.*

She had guessed correctly. All long distance calls were through operators back then and suspending long distance calling was key to success of any golpe de estado, as a military coup is called in Spanish. I hung up and dialed the U. S. Embassy, asking the marine guard on duty who answered for the home phone of the ambassador so I could let him know what was going on. The marine replied that he was not permitted to give me that number, but he did give me the phone of the duty officer, so I called him and woke him out of a sound sleep. He answered and became fully awake almost instantly, listening to what I had to say, taking my name and phone and thanking me profusely.

Obviously the embassy staff didn't have a clue before I called. Within a minute I had a call from the Embassy security officer who said he was heading out the door for the Embassy. He asked me to get all possible details should I receive any other phone calls, saying he would call me again as soon as he reached the Embassy. He called about 30 minutes later from the Embassy. I had received no more calls. I asked him what he saw in the street. He saw 3 army tanks; one in front of the presidential palace, one in front of Radio Nacional (the government radio station) and I forget where the third was.

All radio and TV stations were off the air. At 7:30 a.m. 3 radio stations came on

President's "Recall" continued on pg 14

Old Truck's Cinderella Story

Harvard, IL: Wayne Jesionowski's hobby is toy trucks, primarily toy telephone trucks. Somehow though, one internet search back in 1998 turned up something he certainly hadn't bargained for.

Someone in Pennsylvania had a not so pretty 1948 Chevrolet phone company installers truck that he was considering selling. The owner was the son of a deceased phone company employee who had purchased the vehicle in 1956 ... they used it on their farm in PA. If Wayne was going to restore it to its original condition, he could have it quite reasonably ... if he was going to do other things with it, like make it into a street rod ... well, it was going to cost a lot more.

Wayne, a 29 year plus and soon to be retired fleet mechanic for SBC/Ameritech, bought it. He had never before restored a vehicle but had lots of fun learning how. He got plenty of assistance from his son Wayne Jr., now a high school senior. Wayne Jr. plans on using it on prom night next spring ... *the old girl is going to the big dance* ... how's that for a Cinderella story!

Wayne had to replace a right front door, a back end service door and recover the seat. There were 93658 (first time) miles on the truck when he got it ... The engine was changed from the original 216 ci to a rebuilt 235 ci..

Of course a lot of rust was sanded and sandblasted off . Then the whole thing was repainted official AT & T fleet green. N.O.S Illinois Bell decals were located and applied. Co-workers and acquaintances for the most part, gave him period Bell System tools to equip the truck with; a Bell System tree trimmer has to go back to its owner if Wayne sells the truck. Most of the truck's original bins and drawers were still in the box.

The truck doesn't just sit in the garage and get pushed out on Sunday to be polished. It makes regular summer time trips to area car shows or cruises and occasionally goes to the local D.Q. too. Wayne Jr. and daughter Monica, now a college freshman, have accompanied their dad on countless jaunts. The factory installed air conditioner works just like the day the

Cinderella Story continued on pg 11

San Jose Show

Photos by John Tipo Hui

From co-host Gary Goff: We had about 100 collectors, spouses, friends, and others attend the show. We actually had the equivalent of about 30 tables covered with phones and parts. In addition to some very nice telephones, some for sale, and some for display only, there were more parts than I have ever seen at one of our small shows. The late Gerry Billard's daughters (3) and his widow attended and brought two tables full of Gerry's repro phone parts and other telephone items. Al Ilexis from Chicago, and his wife, planned a long weekend in the Bay area so he was able to attend the show for a couple of hours. There were several collectors from Southern California, 400 miles to the south, but few if any collectors from the northern end of the state. None of the Arizona collectors who planned to attend were able to do so. We hope that earlier planning for next year's late fall northern California show will result in a much larger turnout.

And from Hal Belden:

John Tipo Hui brought an amazing

Please turn to bottom of next page ...

Above: John Tipo Hui's fantastic wooden receiver collection.
Top Left: Steph Kerman was in attendance.
Top Center: Hal Belden's restored W/E No.10 glistens.
Top Right: In the background, co-host **Gary Goff** chats with an unidentified lady. In the foreground **Jerry Paxton** and S-C vanity and **Mrs. Paxton** with back to camera.
Right Center: Graham Smith's restored rope shaft.

Right Bottom: Dan Golden's W/E 2 boxer with a Nmbr 5 arm and is that maybe a "Queen Mary" right behind it.

Roger's Sixty-Four Year Career in Telephony (and Still Trudging Along).

By Roger Conklin

My interest in telephones started one Christmas when I was 8. There was a box containing two flashlight-powered toy telephones under the Christmas tree that morning. We didn't even have a real phone in those days, although some of our neighbors did. World War II hadn't started yet, Franklin D. Roosevelt was president and the depression was just winding down. I bought some iron wire and electric fence insulators at the local hardware in Bedford, Michigan and, using these toy phones set up a line with my buddy who lived on the other side of the open field that separated our house from his. The next year we got a real phone connected to Michigan Bell's Battle Creek exchange. It was a Western Electric 300N magneto ringer box with a 202 desk handset. The installation cost was $3.00 and the monthly service rate was $1.75. When the war started in 1941, a "temporary" 10% federal tax was imposed on local service and a 25% tax on long distance "to help finance the war effort."

I was fascinated by telephones. Dad took me several times to visit the little country magneto exchange at Banfield, about 6 miles away. Afterwards on Saturday's I would hop on my bike and pedal over the gravel road to Banfield for the day. Citizens Telephone Co. of Banfield had a Kellogg 30 line magneto switchboard located in a private home. The company had 92 subscribers, having dropped from 250 at the beginning of the depression. During the war, old phones, mostly North Electric cathedrals that had been stored in a barn, were cleaned up, the wooden boxes re-varnished and then installed as economic times got better and more folks were able to afford telephones again. Where we lived was on the boundary between the Banfield and Battle Creek exchanges, so we soon installed a Banfield phone as well. Installation was free, and the service rate was $2 for 3 months, billed and payable quarterly. New phones for civilian service were not being made during most of the WW II years. Near the end of the war limited production of phones was restarted, but they were rationed and telephone companies were required to set up a priority system for connecting new subscribers. Banfield was able to buy 2 phones every 6 months, and decided on the new and modern Leich 86 (beehive) set. The first one was installed in the home of one of the board members.

Regular service in Banfield was provided from 6 a.m. to 9 p.m. On Sundays it was 7-9 a.m. and 5-7 p.m. Out-of-hours calls cost 10¢. Central rang on and rang off with one long ring on every line at the beginning and the end of the service periods.

When I was 11, I got a job as the Saturday morning operator on the Banfield switchboard at 11¢ per hour. The pay wasn't much, but it was a lot more fun than mowing lawns at 25¢ per lawn with a hand lawnmower. Power mowers hadn't been invented yet. On Saturdays and during summer vacation while in high school I climbed poles, trimmed trees, installed and fixed phones, earning and saving money for college. During my early college years I worked summers and Saturdays at Banfield and for other small Independent phone companies in Hickory Corners, Delton, and Sunfield. I bought my first antique phone, a WE 2 boxer for $1.50 in 1950 from the farmer who owned it when I took it off his wall and replaced it with a new Leich 86. During the summer I worked outside during the day and rolled a bed up to the switchboard and worked the night operator shift. The night alarm woke me up when there was a call. Later in college I landed a job for 3 summers with Kellogg Switchboard & Supply Co., installing manual common battery switchboards in Fortville, IN, Winder, GA, Concord, MI and Convoy, OH. I also installed a Relaymatic automatic system in Johnsville, KY and Kellogg crossbar systems in Forest City and Emmetsburg, IA. The first 500 set I ever saw was while standing in line for fall registration at the University of Michigan in 1951.When I went back to college one fall, I awed my classmates telling them I had been in London during the summer for the coronation of Queen Elizabeth (subsequently admitting that it had been London, KY, near Johnsville). Incidentally, Northwestern Tel. In London still had an early Strowger switch that had never been equipped with dial tone. You just took down the receiver and dialed. Dial tone was introduced in the U. S. in 1919.

While at the University of Michigan in Ann Arbor, I went on a field trip with other engineering students to Michigan Bell's new installation in nearby Detroit to see the newly inaugurated AMA – Automatic Message Accounting equipment that allowed some Detroit subscribers to dial some long distance calls directly. Most

Roger at age 20 testing a Kellogg crossbar switch prior to the cutover of a new 1000 line dial system in Forest City, IA in 1952.

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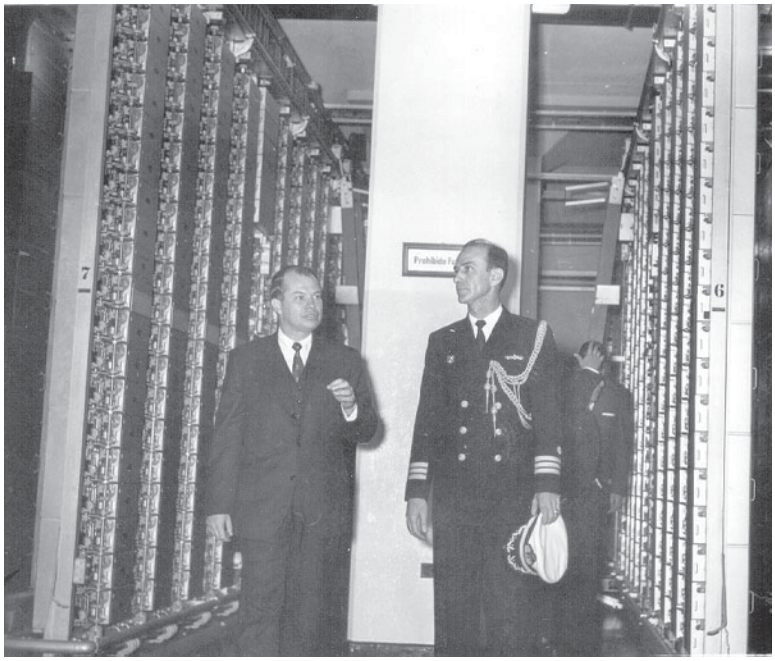
display of VERY early wooden receivers and Williams coffins.

Stan Swihart was there with the very first trial printing of his new 2 volume book on dials. Looks very good and covers dials all over the world. He expects to be able to deliver them in December.

As a weird sidelight, I just recently got the old radio collecting bug and, strangely enough, I found a 1925 Tower cone speaker in its original shipping crate at the show which is now sitting on top of my 1925 Grebe MU-1 battery radio!

We did have a non-member show up with a large switchboard in his van.

other places you still had to dial zero or ask the local manual operator for long distance in order to make a long distance call. Direct dialing from Detroit was only available to the few big cities that had 2 letter, 5 numeral phone numbers. Most towns with automatic dial phones still had 4, 5 or 6 digit numbers back then.



Roger conducts a tour for the Peruvian Navy Minister, a member of President Belaunde's cabinet, through the new 10,000 line 7-A2 San Martin Rotary Telephone Exchange in Lima. This tour followed the just-concluded commissioning ceremony during which the Archbishop of Lima pronounced the blessing and the Minister gave the keynote address. The Prohibido Fumar (No Smoking) sign is partially obscured by the minister's head

In those days not everybody was convinced that the automatic dial telephone was for everywhere. New manual common battery switchboards were still being installed to replace magneto service into the early '50s. Some of the very large Bell cities, like Chicago, still had a mixture of automatic and manual service. A few smaller towns had dial service, but magneto service and crank phones were found most everywhere in small towns. Many medium-size cities had dial phones, but common battery manual service was still quite common.

When I received my degree, I went back to work for Kellogg and was shipped off to Puerto Rico to supervise equipment installation for the completion of the conversion of San Juan from manual to dial operation. Knowing no Spanish, I had to learn it to communicate with the workers. By this time Kellogg had been bought by ITT, which was also the owner of the telephone company in Puerto Rico. At that time San Juan had one 10,000 line 7-A2 rotary automatic exchange. The suburbs had 3 manual common battery and 2 magneto central offices that we were converting to dial with Kellogg 7-3 Crossbar. Telephone calls between the US mainland and Puerto Rico were via 11 radiotelephone circuits between San Juan and New York. There was also one radiotelephone circuit from San Juan to the Dominican Republic, and another to Havana, Cuba. From either end you placed your call with an international operator and waited your turn to be called back when it could be completed. In the late '50s an underwater cable from San Juan to Jacksonville,FL. improved the transmission quality, provided many more circuits and made operator dialing possible both ways.

I had been deferred from military service because I was in college, but when I graduated and the Korean War had ended, military deferments were no more. Military service was obligatory. The conversion job in San Juan was not completed when I was drafted, inducted into the army at Ft. Buchanan, PR and, after basic training in Ft. Dix, NJ sent to the Army Electronic Proving Ground at Ft. Huachuca, AZ for the better part of 2 years. I had met Nancy, my future wife, in Puerto Rico just weeks before getting drafted, and we were married in San Juan when I was shipped back there for military discharge. Then it was off to the University of Michigan for a semester of graduate studies, and back to Kellogg again, this time at the main plant on Cicero Avenue on Chicago's southwest side. I worked in production control and factory engineering for crossbar equipment, and ended up managing the central office applications engineering department for a few years. Kellogg's factory was next door to the Cracker Jack factory and just a few blocks from Midway Airport.

Then I took a job with Cook Electric on Chicago's north side as chief engineer for the next couple of years. Cook made central office main distributing frames and protectors for all of the Independent manufacturers and telephone companies. Our principal customers were ITT Kellogg, Automatic Electric, North Electric, Stromberg Carlson and Leich Electric. Cook also made loading coils, loop extenders, cable terminals and station protectors for the Independents, and during this time we introduced its Type 500 fuseless station protector, which became the system standard for General Tel (GTE), United Tel., Centel, Continental, Mid-Continent and was widely used by the REA borrowers.

Then it was off to South America for 11 years. I became executive vice president and deputy general manager of Compañia Peruana de Teléfonos, the ITT-owned telephone company in Lima, Peru. During my 4 years in Lima, we doubled the size of the Lima network by adding several new Pentaconta Crossbar exchanges to the existing Rotary network. That job came to an end with the forced sale to the government by ITT of the telephone company. From Peru, ITT transferred me to Rio de Janeiro where it owned a factory manufacturing its Pentaconta Crossbar systems, telephone sets, transmission equipment and PBX equipment for the Brazilian market. The whole family had to learn Portuguese, but we were young then and it wasn't too hard. Brazil, a country with a 90 million population had less than 1 million lines in the whole country. Government regulators had kept telephone rates so low for some 30 years that the privately owned phone companies couldn't raise money to expand. Rio had had one of the most modern fully automatic telephone systems in the world just before WW II. New service was available

on demand back then. Orders for new service got behind during the war when equipment was not available. With inadequate rates after the war the system was not expanded and become so overloaded that service deteriorated badly. The waiting list for new service was so many years long that applications were no longer being accepted. In 1970 when we arrived in Rio you waited, on the average, 45 minutes after taking down the receiver before hearing dial tone during the daytime hours. The government had just taken over the private companies and was starting a massive expansion program. Today, 33 years later, Brazil's population has nearly doubled from back then and there are now some 50 million fixed and another 50 million cell phone lines in service, all privatized again, serving that country. For 2 years I headed up an ITT consulting group providing technical and managerial expertise to the government-owned telephone companies and the Ministry of Communications. Rio de Janeiro is one of the most beautiful cities in the world with its 6 million population nestled between the sparkling sandy beaches of the South Atlantic and lush green mountains.

After a total of 17 years, I left ITT in Brazil to become Brazil country manager for Continental Telephone Corporation and later managed a Brazilian-owned company that pioneered there the installation of gel-filled direct buried copper cables for new housing developments and inter-city PCM toll networks, and supplied network management systems to Embratel, the Brazilian long distance company. Those were years of incredible growth and modernization of the Brazilian telephone network. While with Continental, joint efforts between Continental and Cook Electric resulted in Cook opening a factory in Brazil and the 5-pin central office protector module, pioneered by Cook, was made the Brazilian standard. That plant was purchased by Corning Cable Systems some 3 years ago. Changing tax laws in the US on citizens working abroad forced us to pull up roots and return to the U.S. Miami has been our home for the past 27 years.

Back in the States I became president of Cook Electric's international sales subsidiary in Miami. Northern Telecom soon acquired Cook, and I became vice president of Northern Telecom's Caribbean and Latin America outside plant product sales and marketing. Our 5-pin protector became the standard of newly privatized Telmex and the phone companies in Peru, Chile, Argentina, Venezuela and Costa Rica, beating out European competitors.

During all of these years I have had an opportunity to travel the world and have visited 87 countries. I started picking up old phones when still in Brazil, a hobby I have continued more seriously since retiring from Northern Telecom in 1993. I'm still keeping busy with part-time consulting in the area of Latin American telecommunications marketing, our church, phone shows and visiting our kids and grand children around the country. It has been an interesting and exciting lifetime, and I can't think of anything I would liked to have done differently.

Roger Conklin
11/06/03

The S/W editor asked Roger to submit this autobiography ... We hope to have similar offerings from other collector "icons" in future editions. This will be one tough act to follow though.

More from San Jose Show

Top: John Tipo Hui had these rare R/W/B signs on his table right next to those rare wood receivers on page 5.

Above: Mrs Jerry Billard and **Lucille Souza.** Mrs. Billard, 3 daughter's and a grand daughter of the late Gerry Billard had 2 tables of repro parts. They are trying to liquidate a large supply of brass repro W.E. style dial candlestick parts. Hal Belden says if you have any interest in these and other parts contact him by e-mail at mail@vintagephone.com and he will forward your inquiry.

Right: Another of **Graham Smith's** rare phones

Telephone History & Practice in the US

By George W. Howard

Chapter 1.

Telephone engineer Kempster B. Miller wrote:

"The history of the telephone, from its inception to its present state of perfection, is interesting in the extreme, and affords a striking example of the fact that great inventions are almost invariably the result of long and careful study on the part of many workers, rather than the sudden inspiration of a single genius. It is of even greater interest from a scientific standpoint, for in no way can one obtain a better idea of the fundamental principles involved in telephony than by following their development, step by step, noting the contributions made by each of the many scientists and inventors whose names are closely connected with electrical progress."[1]

The reader knows that the telephone carries the human voice to a distant recipient with electricity as its vehicle. It was the invention of the telephone transmitter that made it possible to convert the human voice into electrical waves that could be reconverted into sound at the distant end. Three discoveries were necessary before the telephone transmitter[2] could be invented.

The first necessary discovery was a source of steady electrical current. Static electricity was known to ancient men.[3] The telephone works by flowing electricity – current – not static electricity. The steps to discovering and harnessing electrical current started in 1786 with Luigi Galvani's discovery that severed and moist frog's legs, put into contact with iron and copper, involuntarily contracted.[4] Although Galvani erred in concluding that the electricity causing the contractions came from the frog's tissue, Alessandro Volta correctly theorized that it was the contact of the two dissimilar metals that generated the electrical flow. In proving his theory, Volta invented the "voltaic pile", a battery.[5] The battery released its electrical energy gradually and continuously, unlike the clouds releasing theirs in the form of lightening. Volta made electricity manageable and useful.[6]

The second necessary discovery was the invention of the electromagnet. The electromagnet traces its history to 1820, when Oersted discovered that current flowing through a wire caused a suspended iron needle nearby to move.[7] Shortly afterward, Arago found that iron filings behaved precisely the same way around a wire with flowing current as they behaved in the neighborhood of a permanent magnet. Both Arago and Ampere were able to use electric current to magnetize iron needles, the latter gentleman using a coil of wire for the purpose.[8] Four years later, William Sturgeon made a prototype electromagnet, and shortly afterwards, Joseph Henry perfected the electromagnet, demonstrating that it had sufficient power to perform substantial work.[9]

The third necessary discovery was the magneto electric generator. In 1831 Michael Faraday discovered that he could generate electricity by passing a coil of wire through the lines of magnetic force of a magnet.[10] The first practical magneto electric generator was constructed by Hippolyte Pixii in Paris in 1832.[11] By 1834, Clarke of London had produced a magneto electric generator in form very similar to that used in early telephone work.[12]

By 1832, all the electrical and magnetic principles were available with which to transmit the human voice by electricity.[13] All it would take was someone to fit them together in a practical apparatus in order to accomplish the end. Credit for the invention of the telephone has been variously ascribed to a number of inventors, or at least claimed by them, but most authorities repose confidence in the legal system which proclaimed Alexander Graham Bell the inventor. That confidence may be misplaced. The context of the legal battle revolved around the United States patent law. The outcome of patent litigation is often arbitrary, because the law recognizes only one inventor for an invention – not multiple inventors, which is more often closer to the truth. In any litigation, the outcome may be as influenced by factors such as the skill of the lawyers, and the location of the court in which the proceedings are held, as much as the truth. In the telephone patent cases, some of those who claimed the invention for themselves were never given an opportunity to present their claims, as they were not parties to the proceedings.[14]

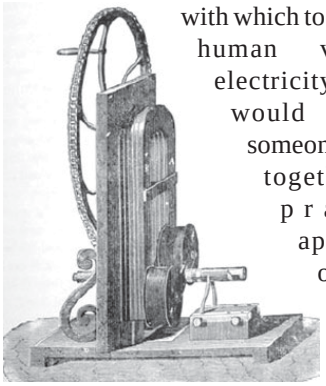


Figure 1: Magneto-electric generator produced by Clarke of London, 1834. Taken from The Age of Electricity, by Park Benjamin, New York: Charles Scribner's Sons, 1886, at page 91

We are not going to resolve the interesting question of who invented the telephone. Moreover, for our purposes, it doesn't really matter, because we are going to be studying telephone practice – that is, the telephone apparatus and methods that were put into actual use in commercial telephony. For those interested in a reading list on the question of "who" invented the telephone, refer to the end note.[15]

There is no question but that the first inventor of a commercially successful telephone was Alexander Graham Bell. His biographer, Professor Bruce, an engineer and historian, has written the story of Bell's invention of the telephone, which is both authoritative and entertaining.[16]

On a hot evening on June 2, 1875, in the attic of the Charles Williams electrical shop at 109 Court Street, Boston, Bell and his assistant Thomas Watson were working on an instrument designed to transmit multiple telegraph messages on a single wire ("multiple telegraphy")[17]. The theory was that a metal reed, which was "tuned" to a specific frequency, could be made to vibrate across the lines of magnetic force of an electromagnet, imposing an electrical alternating current in the electromagnet's coil, of the same harmonics (cycles per second) as the vibrating reed. The alternating current could be carried to a distant location and reproduced at the other end by a similar instrument.[18] With a series of tuned reeds at each end, in theory, several messages could be sent simultaneously and

separated harmonically. He assumed it was necessary to use an electromagnet because he thought the alternating current generated by the tuned reed alone would be insufficient to travel a distance and excite another tuned reed.[19] Watson was in a different room with a set of three receivers, and was plucking a recalcitrant tuned reed for the purpose of adjustment, when Bell heard the sound of the plucking (including timbre) at his end of the line. Surprisingly, no transmitter current was in the circuit (i.e., the electricity was not flowing through the electromagnets). Bell was sagacious enough to recognize at that moment the discovery of an important truth. As Professor Bruce explains, "He knew what had happened, and he knew what it meant. On the strength merely of some slight residual magnetism, the plucked reeds had induced the undulatory current he had postulated nearly a year before. And that preposterously feeble current, exciting the electromagnets in this room, had made their reeds vibrate in precisely the same way, vibrate vigorously enough to generate audible sounds. It dawned on him that he had grossly exaggerated the degree of vibration required to make a sound. An incredibly minute disturbance would do it."[20]

The telephone's principles were now discovered; it was up to Bell and Watson to fabricate an apparatus that would actually transmit the human voice. At the conclusion of work on June 2, 1875, Bell sketched out a "membrane" telephone transmitter for Watson to build.[21], a precursor to the "Gallows" instrument. The next evening Bell arrived at the Williams shop to test the new instrument over a line of about 200 feet running from the 5th floor attic room to the 3rd floor. Bell could hear nothing; Watson thought he could hear the tones of Bell's voice and "almost" catch a word now and then.[22]

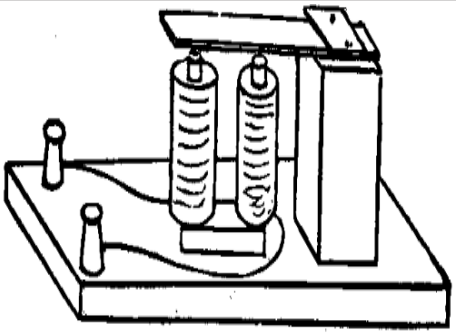


Figure 3: Typical receiver used during Bell's experiments, 1873-1876. Taken from Bell's Deposition in the Suit to annul the Bell patents, titled The Bell Telephone, Boston: American Bell Telephone Co., 1908, at page 245.

It was not until March 10, 1876, almost 10 months later, that Bell was able to transmit articulate human speech for the first time, and that transmission was over an instrument based upon the "variable-resistance" theory[23] developed by Elisha Gray.[24] By May Bell had returned to the development of the earlier transmitter[25] that we refer to today as the "magneto transmitter". Professor Bruce, Bell's biographer, offers an explanation for Bell's abandonment of the only transmitter that had transmitted the human voice: he lacked confidence in his quantitative theorizing which supported the variable resistance theory, and further experimentation had yielded no improvements in the instrument.[26] After only two days of experimentation in May 1876 his improved double-pole magneto transmitter was faithfully transmitting the articulate human voice.[27]

In August 1876, during Bell's visit with his parents at Tutelo Heights near Brantford, Ontario, Canada, Bell successfully transmitted articulate human speech eight miles over a commercial telegraph line with his transmitter utilizing a membrane diaphragm and an electromagnet.[28] After his return to Boston, he took up experimentation with the telephone as his primary employment, resulting in the substitution of membrane with a thin iron diaphragm, and using the same instrument for both transmission and reception.[29] In a series of experiments, he was able to transmit the human voice over commercial telegraph lines a distance in excess of one hundred miles.[30] By April 1877 he replaced the electromagnet with a permanent magnet[31], and this was the form of the first commercial telephone.

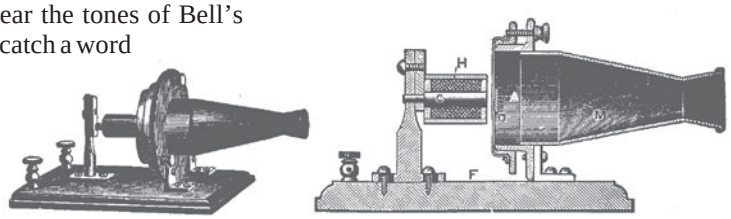


Figure 4: Bell's single-pole magneto transmitter as used at the Centennial Exhibition, Philadelphia, June 1875. Taken from Bell's Deposition in the Suit to annul the Bell patents, titled The Bell Telephone, Boston: American Bell Telephone Co., 1908, at page 97.

Figure 5: Bell's "iron box" receiver, as taken from Bell's Deposition in the Suit to annul the Bell patents, titled The Bell Telephone, Boston: American Bell Telephone Co., 1908, at page 100.

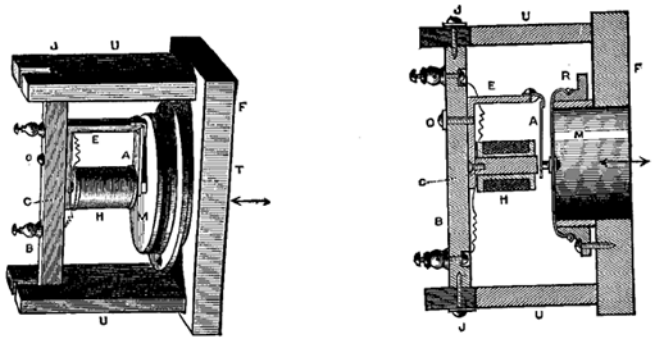


Figure 2: Experimental form of Bell's magneto telephone with single pole magnet and membrane diaphragm. Taken from Bell's Deposition in the Suit to annul the Bell patents, titled The Bell Telephone, Boston: American Bell Telephone Co., 1908, at page 69.

In the next chapter, we will carefully examine the first commercially used telephone, the camera-box telephone. But before we do, it is important to understand how the telephone transmitter that Bell invented works. Recall that Bell's transmitter is a magneto generator. In the earlier form, a magnetized rod ("pole piece") forms the core(s) around which is wrapped insulated wire in which no electricity is flowing. The permanently magnetized rod has invisible magnetic lines of force. Facing the end of the pole is a tightly stretched piece of goldbeater's skin – like that used over the

head of drums used for musical instruments. Affixed to the center of the skin, by some mastic, is a flat patch of soft iron. As the human voice is applied to the goldbeater's skin membrane, the flat patch of soft iron vibrates with the stretched skin, causing the soft iron piece to cross the lines of magnetic force of the magnet. That causes a change

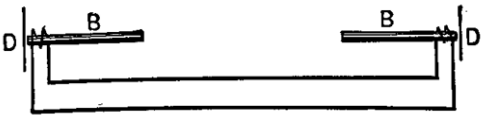


Figure 6: A diagrammatic sketch of how Bell's Magneto transmitter works. Taken from American Telephone Practice by Kempster B. Miller, 1st ed, New York: American Electrician Co., 1899, at page 7.

or movement in the magnetic lines of force, and the lines of force in their movement cut across the stationary coil of wire, causing the generation of alternating electrical waves in the coils of wire. The magneto generator accordingly produces waves of electricity (Bell's "undulatory current") which excite an electromagnet at the other end of the line, converting the electrical impulses into the sound of the human voice.[32]

The magneto generator was materially improved by the substitution of two pole pieces for one, and the introduction of a soft iron diaphragm to take the place of the goldbeater's skin. The iron diaphragm was more efficient at causing the permanent magnet's lines of force to move or change, and the double coils of wire produced greater electromotive force.

(Next Month ...Bell's camera phone)

.....

End Notes

(Endnotes)[1] Miller, Kempster B. American Telephone Practice, 1st ed.,NewYork: American Electrician Co., 1899, at page 1.

[2] The reader is familiar with a modern telephone, which includes a transmitter, a receiver, a calling device (bells or electronic "warbler"), and a device to signal the central office switch (a "dial" or "tone pad"). This chapter is confined to the invention of the transmitter portion of the telephone.

[3] Benjamin, Park. The Age of Electricity, Boston: Charles Scribner's Sons, 1886, at pages 1-3.

[4] Ibid., at pages 28-29.

[5] Ibid., at page 31.

[6] Ibid., at page 32.

[7] Ibid., at page 85.

[8] Ibid., at pages 85-86.

[9] Ibid., at page 86.

[10] Ibid., at pages 89-90. It has been reported that Joseph Henry of Princeton University probably discovered the same principle, styled magnetic "induction", shortly before Michael Faraday, but Faraday published first, and is so credited. See, Bruce, Robert V., Bell: Alexander Graham Bell and the Conquest of Solitude, Boston: Little, Brown & Co., 1973, at p. 4.

[11] Ibid., at page 90.

[12] Ibid., at pages 90-91.

[13] Bruce, Robert V., Bell: Alexander Graham Bell and the Conquest of Solitude, at p. 4.

[14] Two inventors come to mind. The better known was Elisha Gray, the lesser known was Antonio Meucci. See, Baker, Burton H., The Gray Matter: The Forgotten Story of the Telephone, St. Joseph, Missouri: Telepress, 2000; see also, Schiavo, Giovanni, Antonio Meucci, Inventor of the Telephone, New York: The Vigo Press, 1958.

[15] See, Aitken, William, Who Invented the Telephone?, London: Blackie & Son, Ltd., 1939; Baker, Burton H., The Gray Matter: The Forgotten Story of the Telephone, St. Joseph, Missouri: Telepress, 2000; Dolbear, A[mos] E., The Telephone, Boston: Lee & Shepard, 1877; Du Moncel, Count, The Telephone, the Microphone & the Phonograph, London: Kegan Paul, Trench, & Co., 1882; Evenson, A. Edward, The Telephone Patent Conspiracy of 1876: The Elisha Gray – Alexander Bell Controversy and its Many Players, Jefferson, North Carolina: McFarland & Company, Inc., 2000; Harder, Warren J., Daniel Drawbaugh: The Edison of the Cumberland Valley, Philadelphia: University of Pennsylvania Press, 1960; Schiavo, Giovanni, Antonio Meucci, Inventor of the Telephone, New York: The Vigo Press, 1958.

[16] Bruce, Robert V., Bell: Alexander Graham Bell and the Conquest of Solitude. See, especially, pages 144-149, 177-187, 203-208.

[17] Bruce, Robert V., at pages 145-146. See also, Rhodes, Frederick Leland, Beginnings of Telephony, New York: Harper & Brothers Publishers, 1929, at pages 20-23.

[18] Bruce, Robert V., at pages 108-109.

[19] Ibid., at p. 109.

[20] Ibid., at page 147.

[21] Rhodes, Frederick Leland, at pages 23-25.

[22] Ibid., at page 25. Watson's ear may have been engaged in wishful thinking. No one claimed that "articulate" human speech had been transmitted on that occasion.

[23] Ibid., at page 28.

[24] Although Rhodes and later Bruce both claimed that the variable-resistance telephone transmitter was Bell's conception, recent scholarship suggests that Bell actually borrowed the idea from Elisha Gray; that Gray's design came from an employee of the Patent Office. There is some suggestion that Bell's attorney may have put it in Bell's patent specification for the telephone. See, Baker, Burton H., The Gray Matter: The Forgotten Story of the Telephone, St. Joseph, Missouri: Telepress, 2000; see also, Evenson, A. Edward, The Telephone Patent Conspiracy of 1876: The Elisha Gray – Alexander Bell Controversy and its Many Players, Jefferson, North Carolina: McFarland & Company, Inc., 2000.

[25] Bruce, Robert V., at page 187.

[26] Ibid., at page 185. This does not seem to be a very satisfactory explanation. Why would an inventor abandon work on the only device that actually accomplishes the object of his research? Others have suggested that the reason for abandoning the variable-resistance approach was that Bell knew the theory belonged to Elisha Gray and not to himself.

[27] Ibid., at page 187.

[28] Rhodes, Frederick Leland, at page 35.

[29] Ibid., at pages 36-37. Heretofore, Bell had been using a different instrument as a receiver – a crude instrument in several forms, many of which had to be pressed to the ear to dampen the reed so as to hear the sounds transmitted. These earlier forms were finally refined into the so-called "iron box" receiver, which was used in Bell's telephone display at the Centennial Exhibition at Philadelphia in 1876. Refer to Bruce, Robert V., at page 195 for a description and history of the iron box receiver, the following page for an illustration. The reader may note that Bruce apparently thought so little of the receiver invention that it is not mentioned in the index to his book.

[30] Ibid., at pages 38-39.

[31] Ibid, at page 41.

[32] See, Miller, Kempster B., at page 7.

vehicle rolled off the assembly line ... you just crank the windows down. The turn signals are an after factory installation done by the safety conscious Bell System.

He has driven it as far as Madison which is about 100 miles from Harvard. He particularly enjoys the reaction of older telephone workers and pioneers when they see it ... some of their stories are wonderful to hear he says.

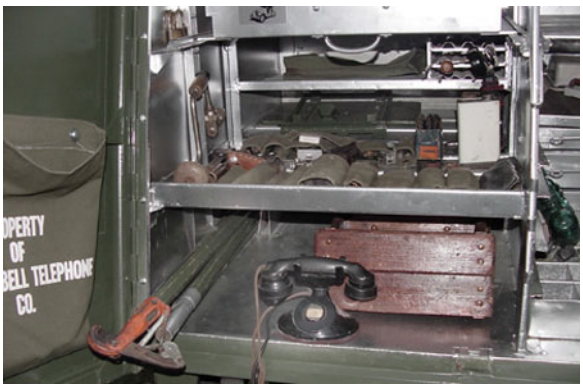
Wayne is not a telephone collector ... a 202 that he keeps in the truck is his only antique telephone. He joined the American Truck Historical Society's Northern Illinois Chapter while the restoration project was underway.

He has also showed the truck at various competitions in the area and has the first place trophies to prove it. Wayne Jr. has a restored Ford El Camino pickup that he used to take to shows but he doesn't do that anymore ... Dad's truck beats his.

Photos by the Editor

This editor has invited Wayne to display the truck at the TCI show in Elgin next Memorial day and I know he will try to be there. I have also invited him to bring his collection of toy telephone trucks along ... That will be a little more complicated though ... we might not see them.

Paul McFadden



Above left: All decals on the truck are N.O.S. Illinois Bell stickers that came from a supervisor who had grabbed a set that was enroute to the dumpster.

Top: She's all restored and looking nice enough to take Wayne Jr. to his senior prom.

Above: *Oh my goodness!* There had been a sign frame on the right front door and one of the truck body service doors. The frames caused major rusting and those doors had to be replaced.

Left: Most of the bins and drawers in the truck body with the 9-15-48 date are original to the truck. The Bell System tree trimmer in the lower left corner goes back to its owner if Wayne sells the truck. Other tools include Bell System climbers and the original Bell System wood ladder.

Above: This license plate indicates that there weren't many ILL BELL telephone trucks licensed to private individuals a couple of years ago.

More photos on next page

The truck is equipped with "after factory" turn signals ... anybody know when they were invented? The odometer says there are ..... miles on the vehicle.

One of the original N.O.S. decals that Wayne turned up. Another thing he found was a Truck Body Material & Layout print. It indicates every tool that the truck should have onboard and where it is to be stored. He laminated it and has it located on the inside of the back door ... its a great reference for figuring out what tools he should look for. By the way ... now you know where the spare goes.

Have a Happy Thanksgiving everyone...
We hope your Thanksgiving turkey looks better than this scrawny bird from the 1923 November Northwestern Bell News

Hey You, Hey Lady!

Buy Sell Trade

There's nothing more fun for the antique telephone collector than going to Jim and Cathie Engle's Cincy Show on Labor Day weekend as this photo by Cathie will attest to. What's this fellows name ... he's a new guy isn't he ... oh yeah, its Dave Martin

John Novack
192 Ashton Drive
Falling Waters, WV 25419
304-274-9079
jnovack@stromberg-carlson.org

WANTED:

Information on the Leich 40-60 D PBX. This was a complete 40 (expandable to 60) line PBX built in a 7 foot 23 inch rack. Need drawings and any other information you may have. Copying costs plus shipping paid, of course. I DO have the sales brochure on this item
Please note that this is NOT the more common Leich 40 that was built into a larger cabinet, but a completely self contained unit, including power supply, built into a 23 inch 7 foot rack.

FOR TRADE: KS 14964 L2 Control unit for the 1A speakerphone system. Marked "Bell System" , "Northern Electric" and "Western Electric" Mfd by DuKane. Trade for 656A transmitter and 758A speaker for the 1A system or ???

FOR SALE:

CD containing scans, in PDF format, of AT&T handbook " Specifications" from the 1920's and 1930's, covering:
Adjustment of Station Apparatus
Station Wiring Plans
Maintenance of A.E. Company Dials at Stations
Subset and P.B.X. Protector Installation
Public Telephone Signs
Dial and Manual Common Battery Stations
Machine Switching Stations
And Much more.
Acrobat Reader Included on CD For PC and MAC

Price $15

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2 - CD Set of Scans of Bell System Practices from the 20's and 30's in PDF Format. Acrobat Reader included on the CD. For PC and MAC

C Series titles include:
Building Entrances
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Jacks and Plugs. Station Number Cards
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Magneto Stations
Desk Stands and Handset Mountings A through E
And Much more.

2 Volume Set $30

CD scans in PDF format of AT&T early drawings from 1905, 1913 and 1920. Lots of early phones and PBX drawings

Price $15

Collectors CD Volume one still available

Scans in PDF format of:
1925 Stromberg Carlson Catalog
1930's Western Electric Railway Catalog
Samson Catalog
Panel switching training book
Edwards Intercom Catalog 1927
Bell Canada Switchboard instruction manual
Bell System 507B Cordless switchboard User Guide
Stromberg Carlson Catalog Bulletins from the 20's
Acrobat Reader included on the CD
For PC and MAC

Price $15

Special all 5 for $50 Postpaid US and Canada

I also have a large selection of Stromberg-Carlson XY drawings, as well as a small selection of Automatic Electric SXS drawings available for copying. Unfortunately few of the AE drawings are the more common switches.
E-mail me your needs. Available for the cost of copying and shipping.

Payment methods:

Postal Money Order, Members Personal Check
Paypal to:
jnovack@stromberg-carlson.org

Party Line

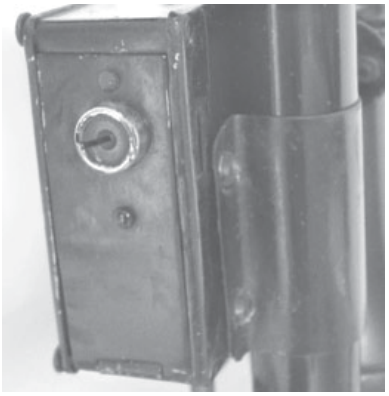
THE ATTACHMENT CORNER
By Mitch Soroka, DC

Dial Candlestick Telephone 5 Cent Coin Collector Attachment

This telephone attachment is a coin collector that attaches to the shaft of a Western Electric dial candlestick phone and requires a nickel per phone call. It is unmarked and I do not know the manufacturer of it. It was made around 1918 to the 1920's since that is when Western Electric made their dial candlestick phones. It is made of black painted steel with a nickel plated brass lever or handle on the front and a nickel plated brass rod on the bottom that goes into the number 3 hole of the dial's finger wheel. The rod prevents the dial from being used unless a nickel is inserted into the slot. When a nickel is placed in the slot and the lever is pulled down, the rod through the dial finger wheel hole moves up and out of the finger wheel hole and allows for dialing out a phone number to make a call. Also there is a metal bar that the receiver hook rests on that releases after the receiver is lifted off the hook and a nickel is inserted. Once the receiver is placed back in the hook, the weight of the receiver in the hook makes the rod move back through the dial finger wheel hole and prevents any further use of the dial until another nickel is inserted. On the side of the unit is a drop down door to the coin compartment with a very small lock marked "Yale" that is where all the nickels end up.

I have seen a similar model like this that has a round nickel plated knob on the front instead of the lever handle that this one has. The phone that this attachment is mounted to in the photos is a model 50-AL with last patents dates to 1918 and has a party line dial and an odd oversized bakelite mouthpiece.

I would say they are somewhat rare and a very unique attachment for a dial candlestick phone.



Can You Hear Me Now!

This conversation took place at Elk River, MN.
Wire chief, testing a line: "How can you hear me now?"
Subscriber: "Not very well. It sounds sort of blurred like a window pane."

The One Thing

Every time the teacher asked Johnny a question, she always got the same answer, "I don't know."
"Johnny," she said, "what is twice eight?"
"Don't know."
"Well, then, four times six?"
"Don't know."
The teacher became exasperated.
"Is there anything you can answer?" she inquired sardonically.
"Yes'm," he replied.
"And what is that, pray?"
"The telephone, Ma'am."
The Northwestern Bell, November, 1923

President Belaunde's "Recall" *cont'd from page 3*

simultaneously, each reading a proclamation signed by the "Military Junta" announcing that President Belaunde had been "removed" and that the Junta was now in charge. That 2:30 phone call came about a half hour before troops entered the presidential bedroom, took him out and sent him into exile on a commercial plane the army had reserved for a chartered flight to Buenos Aires, Argentina the previous day. Fortunately there was no bloodshed and with firm faith in God we never feared for our safety. General Juan Velasco Alvarado, the chairman of the Joint Chiefs of Staff, was the new president. I knew him personally because I had served as the interpreter in a meeting some 7 months earlier between the general and an ITT vice president from New York who spoke no Spanish. The military believed very strongly, for reasons of national security, that a foreign company should not control the telephone company. Over the next 16 months the new government negotiated its purchase from ITT. With the sale completed, we moved to Brazil.

Roger Conklin
11/06/03

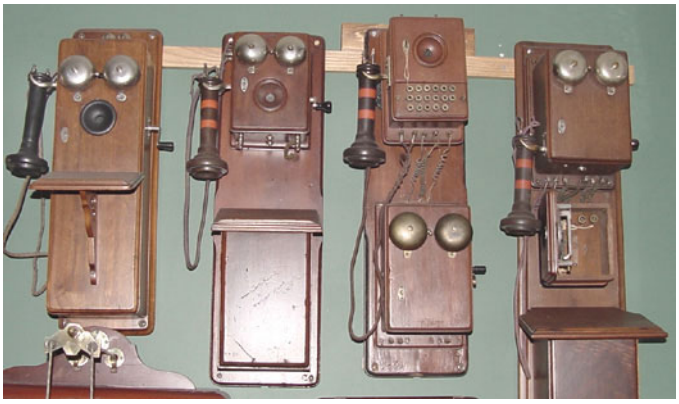
North of the Border Collection

Bill and Karen Doherty's "Stuff"

Left: *Every good collection has to have a Strowger .. and wow, a subset too.*
Right: *The Blake switchboard or intercom set is a mate to the one immediately to the left of this caption.*
Left Center: *Bill's phone book collection and their expensive hangers.*
Bottom Left: *What does a pretty girl's legs have in common with Bill's fantastic 6 foot W/E tandem? They go all the way to the floor.*
Middle Right 2 photos: *Since Bill's collection fills up Karen's dining room, she gets to have a small collection of her own ... upstairs and out of sight.*
Bottom 2 photos: *Look at all of those Blakes. My only Blake has a John Infurna middle box on it. But it's a nice Infurna middle box.*

Photos & Article by Paul McFadden

Not pictured is Bill's W/E vanity, his double wall phone booth with Stromberg-Carlson vanity and Local & Long Distance bell shaped globe inside, most of his signs and 3 fantastic switchboards.
Believe me .. that restored old brick house in Ontario is "loaded."



Upper Left: *Bill bought this bike in Erie, PA in 1996 for $160. It would seem there was a set of the bikes ... the others were a plumbers and an electricians. Karen says they love it and have never seen anything like it anywhere else. The label on the front of the bike is unreadable and any searches she did on the internet didn't come close.*

Above & Below: *Bill acquired the fluted shaft candlestick as part of a collection in 2000. It stands 12 1/2 inches high and the cast base is 5 1/2 inches in diameter ... its a chunk. There are no identification marks on it anywhere ... anybody know what it is? This editor thinks it is an early Sterling but certainly am not going to bet on it. After all, what do I know ... I once said a blue 302 was over priced at $900.*

Left Center: *Lets see, theres the mandatory No.10, well maybe it isn't, a S/C oil can, the fluted shaft stick, a Chicago "pot belly" ... is that a Century on the right end ... and up above a 1901 Kellogg. Well that isn't too shabby a collection is it.*

Above: *I used to see phone nooks all the time but never bothered to buy one ... now when I see one its price is out of sight. Bill's is a nice pine piece.*

Left: *I wouldn't mind having the 2 Bell of Canada hubcap signs, the string phone, the donut phone and the little thing toward the lower right in my collection ... Bill, you keep the rest.*