

AT  
877

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Page #14.

COPPER RANGE COMPANY,  
FREDA MICHIGAN  
JULY 3, 1944.OPER. TIME - LOST TIME AND TONS CRUSHED ON THE NEW DOUBLE IMPELLER IMPACT CRUSHER JUNE 1 TO JULY 1, 1944.

<u>DATE</u>	<u>OPER. TIME</u>	<u>TONS CRUSHED</u>	<u>TOTAL TONS CRUSHED</u>	<u>LOST TIME</u>	<u>REMARKS:</u>
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32,865

June 2nd. 4 hrs. 45 min. 660

" 3rd. 2 " 40 " 385

" 5th. 3 " 35 " 440

" 7th. 1 " 30 " 220

44 ½ hrs.

2nd. half of 5th. set of secondary impeller double blocks worn out and removed. 38% worn, 62% discard. Tonnage 3,105  
 1st. half of 6th. set of secondary impeller double blocks worn out and removed. 42% worn, 58% discard. Tonnage 4,100  
 5th. set of secondary impeller solid blocks worn out and removed. 34% worn, 66% discard. Tonnage 7,205.  
 Welded lugs on the secondary impeller side liners.

" 30th. 4 hrs. 10 min. 605

Crushed in June, 2310

35,175 Total tons crushed to date July 1, 1944.

COPPER RANGE CO.	
W. H. SCHACHT, PRESIDENT	
RECEIVED	
JUL 7 1944	
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COPPER RANGE COMPANY,  
 Freda Michigan.  
 June 2, 1944.

TEST RUN ON  
 THE NEW DOUBLE IMPELLER IMPACT CRUSHER  
CRUSHING COPPER RANGE ROCK

TABULATED DATA:

TIME	BEARING TEMPERATURES			AMPERES		REMARKS:
	24" & 10" BEARINGS	13 1/2" BEARING	7 1/2" BEARING	SEC.	PRI.	
8:15	64° F	64° F	65° F	---	---	Started Pri. & Sec. Impellers @ 8:15 A.M.
8:30	68	70	72	---	---	Started to crush @ 8:30
8:45	82	86	80	150	64	
9:00	90	96	86	160	68	
9:15	98	108	92	150	64	
9:30	106	110	94	150	64	
9:45	112	114	96	140	60	
10:00	114	116	96	160	68	
10:15	116	118	98	150	64	
10:20	---	---	---	---	---	Stopped crushing @ 10:20 A.M. (Inspection)
10:30	118	120	98	140	60	
10:35	118	120	98	---	---	Stopped impellers @ 10:35
11:40	112	112	94	---	---	Started impellers @ 11:40 (cleaning pan conv. chute 30 min).
11:55	114	114	94	---	---	
12:10	120	120	96	---	---	Started to crush @ 12:10 P.M.
12:25	128	124	98	150	64	
12:40	130	120	100	140	60	
12:55	132	126	100	140	60	
1:10	134	128	102	160	68	
1:25	136	130	102	150	64	
1:40	138	132	104	150	64	
1:55	138	132	104	140	60	
2:10	140	132	104	140	60	
2:25	140	134	104	150	64	
2:40	142	134	106	150	64	
2:55	144	134	106	150	64	
3:10	144	136	106	140	60	
3:15	144	136	106	130	56	Stopped crushing @ 3:15 P.M.
3:20	---	---	---	---	---	Stopped impellers @ 3:20 P.M.
			Ave.	147	63	

RATING OF MOTOR		MOTOR DATA		TEST DRAW	
PRIMARY	400 H.P.	87.8 Amps.	PRIMARY	287 H.P.	63 Amps.
SECONDARY	600 H.P.	137 Amps.	SECONDARY	644 H.P.	147 Amps.

NOTE: This test run employed the new double impeller impact crusher, No. 3 secondary, the symons crusher and the four 5 ft. x 10 ft. x 1/4" square mesh screens. The oversize from two of these screens was returned to the double impeller crusher while the oversize from the other two was taken care of by No. 3 secondary and the symons crusher. Actual crushing time was 4 hrs. & 45 min. Crushed 660 tons at 138.9 tons per hour. The rock was wet.



TEST RUN ON  
 THE NEW DOUBLE IMPELLER IMPACT CRUSHER  
 CRUSHING COPPER RANGE ROCK

TABULATED DATA:

BEARING TEMPERATURES

TIME	BEARING TEMPERATURES			AMPERES		REMARKS:
	24" & 10" BEARINGS	13 1/2" BEARING	7 1/2" BEARING	SEC.	PRI.	
7:15	68°F	68°F	64°F	---	---	Started Pri. & Sec. Impellers @ 7:15 A.M.
7:30	70	70	66	---	---	Started to crush @ 7:30
7:45	86	90	80	150	64	
8:00	96	104	86	150	64	
8:10	---	---	---	---	---	
8:15	104	110	90	150	64	Stopped crushing @ 8:10 to patch screen.
8:25	---	---	---	---	---	Started to crush @ 8:25
8:30	112	118	92	140	60	
8:45	116	122	94	150	64	
9:00	122	126	96	150	64	
9:15	126	128	98	140	60	
9:30	128	132	100	150	64	
9:45	132	134	100	160	68	
10:00	134	136	102	160	68	
10:15	136	136	102	140	68	
10:25	---	---	---	---	---	Stopped crushing @ 10:25 A.M.
10:30	138	138	102	130	56	Stopped impellers @ 10:30 A.M.
			Ave. 147	63		

MOTOR DATA

RATING OF MOTOR

PRIMARY 400 H.P.  
 87.8 Amps.  
 SECONDARY 600 H.P.  
 137 Amps.

TEST DRAW

PRIMARY 287 H.P.  
 63 Amps.  
 SECONDARY 644 H.P.  
 147 Amps.

NOTE:

This test run employed the new double impeller impact crusher, No. 3 secondary, the symons crusher and the four 5 ft. x 10 ft. x 1/4" square mesh screens. The oversize from two of these screens was returned to the double impeller crusher while the oversize from the other two was taken care of by No. 3 secondary and the symons crusher. Actual crushing time was 2 hrs. & 40 min. Crushed 385 tons at 144.2 tons per hour. The rock was dry.



TEST RUN ON  
 THE NEW DOUBLE IMPELLER IMPACT CRUSHER  
CRUSHING COPPER RANGE ROCK

TABULATED DATA:

TIME	BEARING TEMPERATURES			AMPERES		REMARKS:
	24" & 10" BEARINGS	13 1/2" BEARING	7 1/2" BEARING	SEC.	PRI.	
11:50	70°F	70°F	70°F	---	---	Started Pri. & Sec. Impellers @ 11:50 A.M.
12:05	76	80	74	---	---	Started to crush @ 12:05
12:10	--	--	--	---	---	Stopped crushing @ 12:10 #2 Crusher chute
12:20	94	98	86	140	60	Stopped impellers @ 12:20 choked.
1:20	96	100	86	---	---	Started impellers @ 1:20
1:30	--	---	--	---	---	Started to crush @ 1:30
1:35	98	104	86	130	56	Stopped crushing @ 1:35 "A" conv.kick-out.
1:40	--	---	--	---	---	Started to crush @ 1:40
1:50	106	110	90	130	56	Overload on symons crusher, 5 min.
2:05	110	116	92	140	60	" " " " 5 "
2:20	116	122	96	140	60	
2:35	122	126	96	140	60	
2:50	124	128	98	140	60	
3:05	126	130	100	140	60	
3:20	130	132	100	140	60	" " " " "
3:35	132	134	100	140	60	
3:50	134	136	100	130	56	
4:05	136	136	100	150	64	
4:20	136	136	102	160	68	
4:35	138	136	104	150	64	
4:50	140	136	106	150	64	
5:05	140	136	106	150	64	
5:10	140	136	106	130	56	Stopped crushing @ 5:10 P.M.
5:15	---	---	---	---	---	Stopped impellers @ 5:15 P.M.
			Ave. 141	60		

MOTOR DATA

RATING OF MOTOR

TEST DRAW

PRIMARY 400 H.P.  
 87.8 Amps.  
 SECONDARY 600 H.P.  
 137 Amps.

PRIMARY 273 H.P.  
 60 Amps.  
 SECONDARY 617 H.P.  
 141 Amps.

NOTE:

This test run employed the new double impeller impact crusher, No.3 secondary, the symons crusher and the four 5 ft. x 10 ft. x 1/4" square mesh screens. The oversize from two of these screens was returned to the double impeller crusher while the oversize from the other two was taken care of by No.3 secondary and the symons crusher. Actual crushing time was 3 hrs. & 35 min. Crushed 440 tons at 122.9 tons per hour. The rock was very wet.



Adams Township, MI

COPPER RANGE COMPANY,  
 Freda Michigan.  
 June 7, 1944.

TEST RUN ON  
 THE NEW DOUBLE IMPELLER IMPACT CRUSHER  
CRUSHING COPPER RANGE ROCK

TABULATED DATA:

TIME	BEARING TEMPERATURES			AMPERES		REMARKS:
	24" & 10" BEARINGS	13½" BEARING	7½" BEARING	SEC.	PRI.	
8:20	70°F	68°F	68°F	---	--	Started Pri. & Sec. Impellers @ 8:20 A.M.
8:35	76	78	76	---	--	Started to crush @ 8:35
8:50	92	94	84	140	60	
9:05	100	104	90	150	64	
9:20	108	110	94	140	60	
9:35	116	114	96	130	56	
9:50	122	120	98	130	56	
10:05	126	124	100	130	56	
10:10	126	124	100	120	53	Stopped crushing @ 10:10
10:15	---	---	---	---	---	Stopped impellers @ 10:15 A.M.
			Ave.	134	58	

MOTOR DATA

RATING OF MOTOR

PRIMARY 400 H.P.  
 87.8 Amps.

SECONDARY 600 H.P.  
 137 Amps.

TEST DRAW

PRIMARY 264 H.P.  
 58 Amps.

SECONDARY 587 H.P.  
 134 Amps.

NOTE:

This test run employed the new double impeller impact crusher, No. 3 secondary, the symons crusher and the four 5 ft. x 10 ft. x 1/4" square mesh screens. The oversize from two of these screens was returned to the double impeller crusher while the oversize from the other two was taken care of by No. 3 secondary and the symons crusher. Actual crushing time was 1 hr. & 30 min. Crushed 220 tons at 146.6 tons per hour. The rock was dry.



TEST RUN ON  
 THE NEW DOUBLE IMPELLER IMPACT CRUSHER  
 CRUSHING COPPER RANGE ROCK

TABULATED DATA:

TIME	BEARING TEMPERATURES			AMPERES		REMARKS:
	24" & 10" BEARINGS	13 1/2" BEARING	7 1/2" BEARING	SEC.	PRI.	
8:40	68° F	68° F	72° F	---	--	Started Pri. & Sec. Impellers @ 8:40 A.M. Started to crush @ 8:45
8:45	--	--	--	---	--	
8:55	78	84	80	160	68	
9:10	90	96	88	170	75	
9:25	100	108	92	175	79	
9:40	110	116	96	175	79	
9:55	118	122	98	175	79	
10:10	122	126	100	160	68	
10:25	126	130	102	160	68	
10:40	128	132	104	170	75	
10:55	134	134	104	170	75	
11:00	134	134	104	160	68	Stopped crushing @ 11:00 (Inspection). Stopped impellers @ 11:05
11:05	---	---	---	---	--	
11:35	128	126	98	---	--	Started impellers @ 11:35
11:50	128	128	98	---	--	Started to crush @ 11:50
12:05	128	128	100	150	64	
12:20	130	130	102	160	68	
12:35	134	132	104	160	68	
12:50	136	134	106	150	64	
1:05	138	136	106	160	68	
1:20	140	138	108	160	68	
1:35	142	138	108	150	64	
1:50	142	140	108	150	64	
2:00	144	142	108	150	64	Stopped crushing @ 2:00 P.M. Stopped impellers @ 2:05 P.M.
2:05	---	---	---	---	--	
			Ave.	161	70	

MOTOR DATA

RATING OF MOTOR

PRIMARY 400 H.P.  
87.8 Amps.  
  
 SECONDARY 600 H.P.  
137 Amps.

TEST DRAW

PRIMARY 319 H.P.  
70 Amps.  
  
 SECONDARY 705 H.P.  
161 Amps.

NOTE:

This test run employed the new double impeller impact crusher, No. 3 secondary, the symons crusher and the four 5 ft. x 10 ft. x 1/4" square mesh screens. The oversize from two of these screens was returned to the double impeller crusher while the oversize from the other two was taken care of by No. 3 secondary and the symons crusher. Actual crushing time was 4 hrs. & 10 min. Crushed 605 tons at 145.1 tons per hour. The rock was dry.



Mr Schoch

7/10/37

This is what I mentioned  
to you a couple of months  
ago on Steam Stamps with  
magnetic action.  
cells is applying this to  
other uses

Money

392		
68		
<hr/>		
460	Thursday	65
68		
<hr/>		
525	Friday	
75		
<hr/>		
600	Saturday	
60		
<hr/>		
660	Sunday	



# ALLIS-CHALMERS MANUFACTURING COMPANY

ELECTRICAL MACHINERY HYDRAULIC TURBINES  
STEAM TURBINES STEAM ENGINES CONDENSERS  
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MILWAUKEE, WIS

IN YOUR REPLY  
PLEASE REFER TO

August 2, 1937

A new principle in electro-magnetic vibration is now being employed in the Utah Screens and Feeders described in the attached pamphlets. This principle, giving a high intensity of vibration, makes use of standard alternating current without resorting to expensive auxiliary equipment such as motor generator sets, etc.

Having been thoroughly tried out during the past four years in large copper ore concentrators and smelters, the Utah Electro-Magnetic Vibrating Screen has demonstrated its high efficiency and low operating costs.

The Utah Electro-Magnetic Feeder has no equal in the solution of feeding or conveying problems where thorough and absolute control of feed rate must be combined with exceedingly low operation and maintenance cost.

The simplicity of the equipment, with no revolving parts, and the fact that the intensity of vibration can be instantly regulated (by means of a dial) to suit the material being handled are important features.

In any problem of screening or feeding we welcome the opportunity of recommending equipment best suited to your requirements. Our offices listed on the back of the pamphlet, will be pleased to serve you.

Yours very truly,

ALLIS-CHALMERS MFG. COMPANY

Manager, Crushing, Cement & Mining  
Machinery Department



**ALLIS-CHALMERS MANUFACTURING COMPANY**

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London, England . . . . . 728 Salisbury House, London Wall E. C. 2	Santiago, Chile . . . . . Sociedad Manufacturera Allis-Chalmers, Edificio Mutual de la Armada, Casilla 48-D.

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**Canadian Representative**

CANADIAN ALLIS-CHALMERS, LIMITED, TORONTO, ONTARIO.

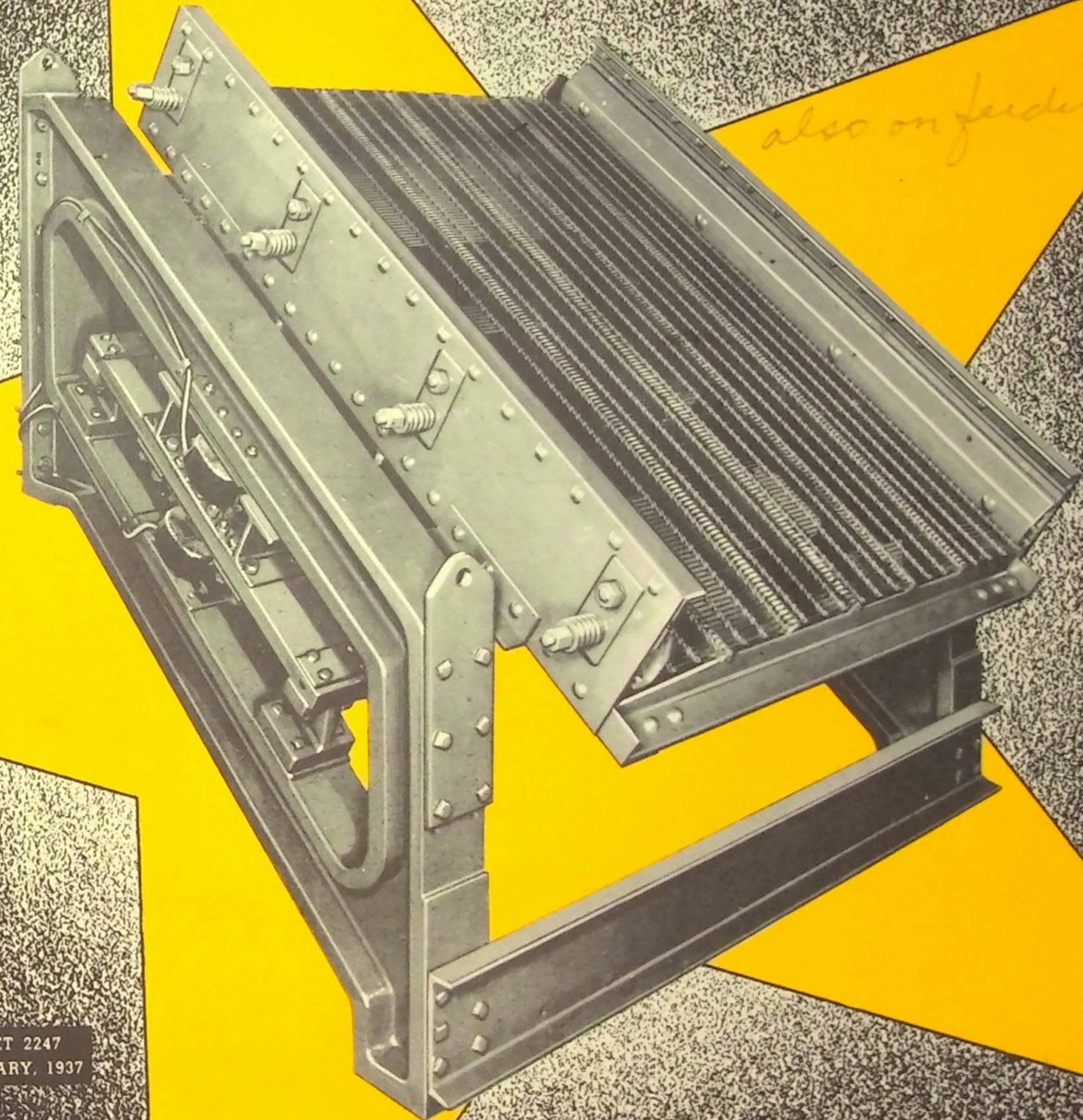
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# UTAH

*Electro magnetic vibrating screen*



*also on feeders*

LEAFLET 2247  
FEBRUARY, 1937

EQUIPMENT ENGINEERS TO INDUSTRY

# ALLIS-CHALMERS



MILWAUKEE WISCONSIN



Introducing the ALLIS-CHALMERS.

UTAH

# Positive Electro Magnetic Vibrating Screen

THE Allis-Chalmers "Utah" Positive Electro Magnetic Vibrating Screen is particularly adapted for the medium and finer sizes of screening, both wet and dry. It has high efficiency and low operating cost, made possible by employing an entirely new principle and by the use of standard alternating current without resorting to expensive auxiliary equipment such as motor generator sets.

The power for operation is supplied from a small bank of Copper Oxide Rectifiers which are mounted on the wall together with a small auto transformer and amplitude adjusting switch for regulating the intensity of vibration. These are included with the screen.

Standard screens are made for 25, 50 or 60 cycle, 440 volt current, the high frequencies being most satisfactory for fine screening.

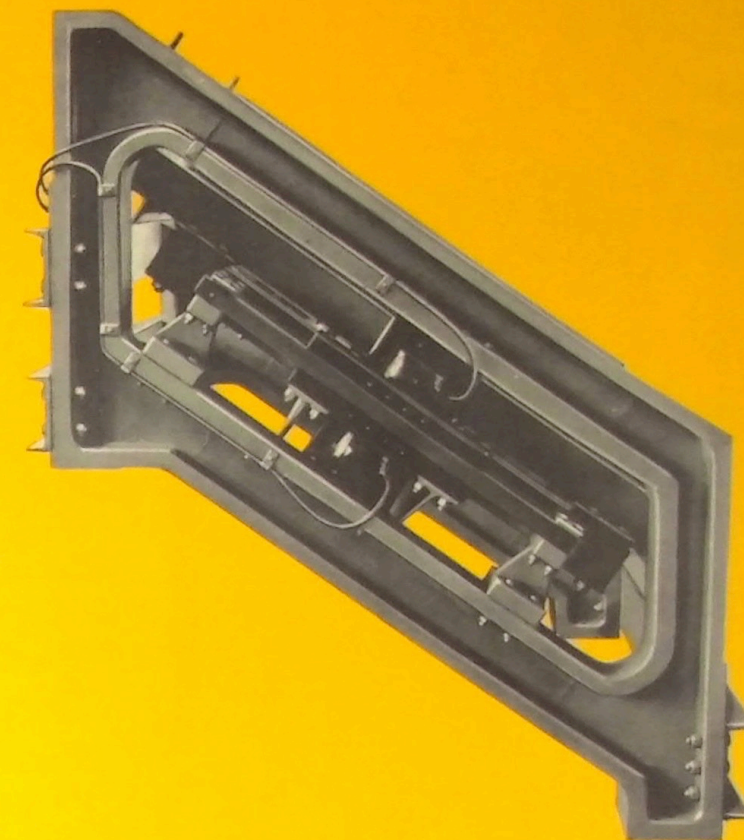
During the past four years these Electro-Magnetic screens have been in continuous operation in large copper ore concentrators and smelters in the western part of the United States. About fifty of these units have been in continuous service by large operators, including Braden Copper Company, Chile, twenty-six screens; Newmont Mining Company, one screen; American Smelting & Refining Company, five screens; American Cyanamid Company, two screens; and the Utah Copper Company about twenty screens.

The high screening efficiency obtained with this screen is due to the fact that the screen cloth is vibrated uniformly over its entire area. With this is combined a high intensity of vibration which can be instantly regulated to suit the size and condition of material being screened by simply turning the regulating dial.

The low power consumption (.4 to .7 kw for a 4' x 6' screen) is due to the development of a new electric magnetic vibrating motor properly applied mechanically to the screen. The electro magnetic forces are applied equally in both directions through the use of dual magnets to produce a power actuated reciprocating movement in opposite directions of vibration without the use of springs or similar devices.

The screen consists of two parallel support frames of heavy design. Each support frame carries a pair of electric magnets, one upper and one lower. Between these magnets and attached to the side frames is a vibrating bar. At the center of this bar is attached an upper and lower armature built of steel laminations. The vibrating elements are connected together by a pair of beams secured to the screen body.

The alternating current used is directed to the magnets through the rectifier which splits the alternating current cycle into halves and delivers each successive half-wave or half-cycle to upper and lower magnets thus producing the reciprocating vibrating motion, which is transmitted to the screen without any revolving parts.



Resilient members are interposed between the screen body and the vibrating member, thus increasing the intensity of vibration, and reducing the power required for operation.

The armatures do not touch the magnets in operation as proper air gap is provided, thus the screen is quiet in operation.

Due to the fact that this screen operates with standard alternating current, it can easily be interlocked with other electrical motors to obtain maximum safety of operation.

Note particularly the simple screen body and the ease with which cloth can be changed. Screen cloth can be supplied in one or two pieces to the length of the screen. It is reversible, thus giving maximum life to the screen cloth.

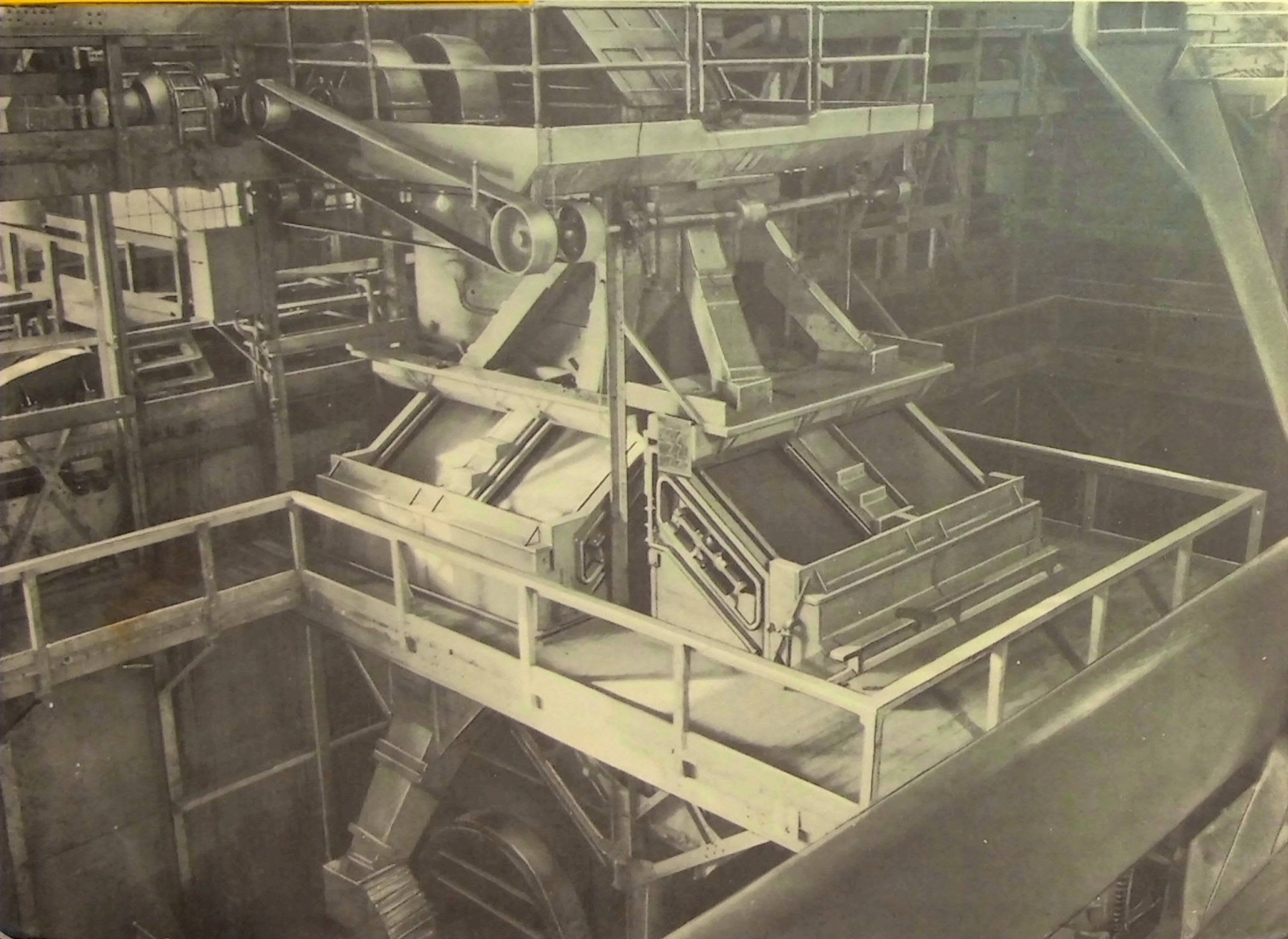
The Allis-Chalmers "Utah" electric vibrating screen is designed and manufactured to permit bolting to the floor, or can be suspended by means of cables and turn buckles.

The proper inclination of the screen varies for different applications. For fine screening in closed circuit an inclination of between 25 and 35 degrees is found most satisfactory. This allows the use of a coarser mesh screen and comparatively heavy wire, which is required where heavy circulating loads are handled.

Single deck screens are recommended where it is possible to use them due to their being more accessible and the ease of changing cloth. Double deck screens can be supplied.

Where fine dry material is to be screened, enclosed screens are furnished equipped with metal enclosures arranged for connection to dust collectors.

The Allis-Chalmers "Utah" Electro Magnetic Vibrating Screen is available in the open type, sizes 4' x 6' and 4' x 7'. These sizes indicate the effective screen area.





Oct. 22/1943

Mr. Wm Schacht

Copy of recent test-requested  
By Mr. B. Manderfield, Supt.  
I will give you returns on silver  
content of table mineral & Filotations  
at later date. J.L.E.



COPPER RANGE COMPANY,  
 CONCENTRATOR LABORATORY,  
 Freda Michigan.  
 Oct. 21, 1943.

AN (8) EIGHT CAR SHIPMENT OF MINE ROCK  
FROM THE 12th. LEVEL OF COPPER RANGE COMPANY'S CHAMPION MINE

Mill Test Of Same:

Pounds of mineral concentrates produced from 8 steel cars of 55 tons each or 440 tons.

Table mineral,	- - - - -	13,050 Lbs.
Flot. concentrates,	- - - - -	12,240 "
Crusher discharge mass,	- - - - -	1,180 "
Bull jig product,	- - - - -	4,045 "
Picked mass,	- - - - -	<u>3,285 "</u>

Total Lbs. mineral concentrates produced, - - - 33,800 Lbs.  
 or 76.8 Lbs. of concentrates per ton of rock treated.

Table mineral,	13,050 Lbs.	assays	65.410	or	8,536 Lbs.	copper.
Flot. concentrates,	12,240 "	"	45.073	"	5,517 "	"
Crusher discharge mass,	1,180 "	"	90.247	"	1,065 "	"
Bull jig product,	4,045 "	"	90.247	"	3,650 "	"
Picked mass,	3,285 "	"	63.276	"	<u>2,078 "</u>	"
					Total, 20,846 Lbs.	copper.

Average milling loss, 2.00 Lbs. cu. per ton milled or 880 Lbs. copper

Average smelter loss from data, .493 Lbs. cu. per ton or 217 " "

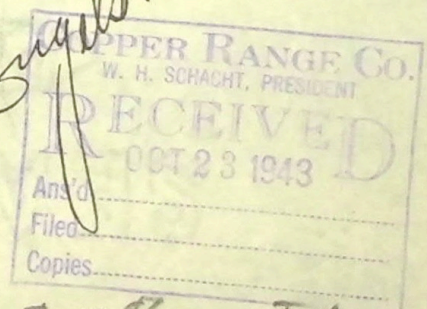
Total Lbs. refined copper, 19,749 Lbs.  
 or 44.88 Lbs. refined cu. per ton milled and smelted.

NOTE:

Weights of mine rock of this mill test are only based on a standard of 55 Tons per R. R. Car and not true weightometer tons.

*Ag. in rough form per ton of concentrate*  
*Rough table 42.37 oz. per ton*  
*Flotation 41.33 oz. per ton*

*W. H. Schacht*



*90% of ore from conglomerate with about 10% sorted ore from globe stones Bull.*



# COPPER COPPER COMPANY

OFFICE OF

Superintendent of Concentrator

Freda, Mich., October 22, 1943

MR. W. H. SCHACHT, President,  
Painesdale, Michigan.

Dear Sir:

The following is the report of operations, crushing rock from C H A M P I O N mine,  
for the period ending Oct. 21, 1943

(The month will be divided into four periods as follows: 1st to 7th, 8th to 14th, 15th to 21st, 22nd to last day inclusive)

	For period ending <b>Oct. 21, 1943</b>	Total from first of month to date
Tons of rock received at plant.....	8,085	21,890
Tons of rock crushed.....	8,415	21,395
Tons of rock milled.....	7,480	19,030
Hours crusher in operation.....	77.99	201.50
Average number tons of rock crushed per head per hour.....	107.89	106.17
Average number tons of rock crushed per head per 24 hours of running time..	2,589.36	2,548.08
Tons of coal burned for heating, etc.....		
K. W. H. consumed.....	190,740	485,265
K. W. H. per ton crushed and milled.....		
Tons of rock crushed but not milled.....		
<b>POUNDS OF MINERAL PRODUCED</b>		
Mill Mass.....	45,495	Percent of total product
No. 2 Primary crusher <b>&amp; Secondary</b> .....	26,600	9.4
No. 2 Secondary crusher.....		5.5
No. 2 Crusher bull jig concentrate.....	71,600	14.8
No. 3 Concentrate tables.....	179,680	37.2
No. 4 Flootation concentrate.....	160,160	33.1
No. 4.....		
Total pounds of mineral produced.....	483,535	1,258,995
Pounds of mineral produced per ton of rock crushed.....	57.5	
Percentage of mineral per ton of rock crushed.....	2.87	

Remarks: **715 tons of uncrushed rock remains.**

Reclamation:	<u>Period</u>	<u>To Date</u>	
Tons Milled	6,858	27,518	less 10% 24,766 dry tons
Lbs. Mineral	68,620	241,515	

Table Prod. 77,480  
Flot. Conc. 164,035

The last day of Dredge Operation was Oct. 20th. Due to lack of power.

Yours very truly,

*W. Engels*  
Superintendent.